

Component	Definition
Premium	A premium is the amount of money charged by an insurance company to keep warranty coverage active. It is typically paid monthly but can be billed a number of ways. The insurance company calculates the premium using this equation: $\text{Premium} = \text{CPU} + \text{SM} + \text{RF} + \text{PT}$. Each of these four components are described below.
Cost per Unit (CPU)	CPU is the core calculation in risk management and is defined as “the average dollar amount needed to cover claim costs, including parts and labor, and in some cases, claims administration.” As an example, let’s assume the CPU = \$100.
Safety Margin (SM)	Safety margin is the amount charged by the insurance company to cover “unforeseen changes” and is added to CPU to come up with the premium. If the CPU is \$100, and the safety margin is 15%, the amount of safety margin would be \$17.65. The equation is not “\$100 X15%”, but instead “(\$100 divided by .85) - \$100 = \$17.65.”
Risk Fee (RF)	Risk fee is the “base wage” for the insurance carrier. It is used to cover carrier resources and deployment of capital/surplus and is added to CPU and SM to come up with the premium. At a \$100 CPU, a 10% risk fee would add \$13.07 or “(\$100 divided by .9) - \$100 = \$13.07.”
Premium Tax	The premium tax is the tax imposed by each state on the carrier in relation to the gross premium allocated to risks located in that state. The insurance carrier passes this on to the consumer or manufacturer. For example, a 2% premium tax would add \$2.67 to the CPU or “(\$100 divided by .9733) - \$100.” Now that we have the four component costs, we would just add them to get the premium. $\$100 + \$17.65 + \$13.07 + \$2.67 = \$133.39$.
Investment Income	Insurance companies have two sources of income: underwriting profits and investment income. The latter is generated through investing premiums into interest-bearing assets like stocks and bonds. Dividends and interest are then used to offset underwriting operations which can sometimes be unprofitable. The longer the term of the contracts sold, the more investment income there is.
Underwriting Profits	Underwriting profits are calculated as “revenues that come from cash collected on policy premiums minus money paid out on claims and for operating the business.” In forecasting claims costs, insurance companies will always be conservative to protect their margins. Manufacturers should recognize this and do their own analysis to make sure that they are not paying higher premiums than they should.
Loss Fund	The amount left over to pay claims after risk fee and taxes are taken out. It is typically equal to CPU + Safety Margin (and sometimes includes investment income).
Profit Share	Percent of the underwriting profits that a manufacturer receives, based on terms of the agreement with the insurer. It can include

	all or a portion of the underwriting profits (usually 50-100%, depending on the size of the program, the known risk, etc.).
“Earned Premium” and Premium Earning Patterns	The term <i>earned premium</i> refers to the premium collected by an insurance company for the portion of a policy that has expired. Earnings curves provide a company with the percentage of premium that should be recognized as revenue at each point throughout the life of the service contract in order to appropriately match revenue with expected claim costs. Approaches commonly used are Pro Rata, Rule of 78s and Reverse Rule of 78s. The Pro Rata approach earns premium evenly over the life of a contract, which assumes that losses are expected to occur evenly throughout the term of the contract which rarely happens. The Rule of 78s method is commonly used when losses are expected to be weighted toward the beginning of a contract such as with Used Vehicles. The Reverse Rule of 78s is commonly used on New Vehicles where the exposure is weighted toward the end of the contract after the manufacturer’s warranty has expired. In general, these benchmark curves provide the benefit of being easy to calculate and explain but rarely reflect an accurate expectation of claim costs throughout the term. (Source: https://www.providers-administrators.com/348218/earnings-curves-matching-premium-with-losses-and-refunds)
Claim Emergence Patterns	The claim cost curve shows the % of claims that occur each month.
IBNR	The acronym IBNR stands for claims “incurred but not reported”. In risk management, it refers to claims that have happened, but the insurer is still unaware of them. As these claims must still be paid out, the insurer must set aside money (“reserves”) to cover its soon-to-be-discovered costs. Since the insurer knows neither how many of these losses have occurred, nor the severity of each loss, IBNR calculations are estimates that can be subject to a range of errors.
Loss Ratio	The loss ratio is defined as “incurred claims divided by earned premium.” The issue is that major errors occur as a result of earned premium miscalculations. A better measurement would be “total forecasted claims / total premium” as this would take into consideration the volatility that can occur throughout the contract term.