

Make or buy decisions (Break-even analysis)

Hahn Manufacturing has been purchasing a key component of one of its products from a local supplier. The current purchase price is \$1500 per unit. Efforts to standardize parts have succeeded to the point that this same component can now be used in five different products. Annual component usage should increase from 150 to 750 units. Management wonders whether it is time to make the component in-house, rather than to continue buying it from the supplier. Fixed costs would increase by about \$40,000 per year for the new equipment and tooling needed. The cost of raw materials and variable overhead would be about \$1100 per unit, and labor costs would go up by another \$300 per unit produced. Should Hahn make rather than buy? What is the break-even point?



Learning Curve Calculator

<http://www.jsc.nasa.gov/bu2/learn.html>

The concept of the learning curve was introduced to the aircraft industry in 1936 when T. P. Wright published an article in the February 1936 *Journal of the Aeronautical Science*. Wright described a basic theory for obtaining cost estimates based on repetitive production of airplane assemblies. Since then, learning curves (also known as progress functions) have been applied to all types of work from simple tasks to complex jobs like manufacturing a Space Shuttle.

The theory of learning is simple. It is recognized that repetition of the same operation results in less time or effort expended on that operation. For the Wright learning curve, the underlying hypothesis is that the direct labor man-hours necessary to complete a unit of production will decrease by a constant percentage each time the production quantity is doubled. If the rate of improvement is 20% between doubled quantities, then the *learning percent* would be 80% ($100 - 20 = 80$). While the learning curve emphasizes time, it can be easily extended to cost as well.

Learning Curve Example:

