

by DR SUN J CHANG

# Production cost structure and cost management

The Business Mind explains how manufacturers can save on production costs while maintaining the quality of their products.

Once visited a particleboard mill. The company was having problems with the strength properties of the boards produced. In order to improve these strengths, it went for an obvious quick fix and doubled the amount of glue applied. While the strength properties improved, the cost of production increased by 30%. What went wrong?

Even though glue typically accounts for 5 to 8% of the weight of the furnish, it represents 50% of the materials cost and a quarter to a third of the total cost of board production. Thus, the quick fix the company was trying to use created an even more serious problem.

## Cost structure

To be a successful manufacturer, you must know your cost structure. In economic textbooks, the total cost of production is broken down into the fixed cost and the variable cost. Here is another example based on a hardwood sawmill.

In a typical American hardwood sawmill, the cost breakdowns are something like this: log cost 65%, electricity and supplies 5%, labour 15%, and overhead 15%. As such, the fixed cost is 15% and the variable cost is 85%. Out of that 85% variable cost, log cost accounts for the biggest chunk of it.

Such a cost structure does not lend itself very well to lower the over-all cost of production quickly. Typically, if you want to lower the production cost quickly, you attack the fixed

cost. For a hardwood sawmill, this means finding savings in the 15% overhead cost, not a very easy task since most sawmills already have a very lean overhead.

## Cost management

The long term solution is to attack the variable cost. Given that raw material cost represents the most significant portion of the cost of production it only makes sense to focus on that part of the cost.

Alas, that is often not what you hear when visiting a sawmill. Often the mill manager will talk about the productivity of the mill in terms of volume of output produced per shift, a measure of labor productivity.

While labor productivity is important, for a sawmill it represents only 15% of the production cost. Even a 10% gain in labor productivity, a huge gain, would result in a modest cost saving of 1.5%.

Instead, attacking the log cost, the biggest part of the lumber production cost, produces much more impressive gains. For example, replacing a 3/16" saw kerf circular saw with a thinner, less than 1/8" kerf band saw often leads to an 8-10% gain in the amount of lumber produced from the same volume of logs.

This translates into a cost saving of 5-8%, about 3.5 to 5.5 times the savings realised from a 10% gain in labor productivity. Furthermore, advances in curve sawing technology allow

the mills to realise double-digit gains in the amount of lumber produced.

Thus, to lower the production cost over time requires continuous improvements in operations as Toyota has been doing for years to become the low cost producer in automobile.

Toyota realised that capital investment in their machineries represents one of their biggest cost items. They needed to get more out of their machineries and focused on minimising the machine down time. For example, by reducing the machine set-up time for their 100 ton hydraulic press from 4 hours to 90 seconds, the output of the hydraulic press increased significantly.

Toyota could also change the mold of the hydraulic press as often as they want without stopping the entire production line. An additional benefit of the short machine set-up time is that it allowed Toyota to implement the just-in-time system and keep

**“To be a successful manufacturer, you must know your cost structure.”**



a minimal amount of parts on hand, thus reducing their cost of automobile production.

The same procedure has now also been used by PF Chang, a restaurant chain in the United States, to lower their production cost while still maintaining the quality of the food served in their restaurants.

The point I am trying to make here is that you must know your cost structure before you can effectively manage your production cost. In the case of a sawmill, pursuing a 5% gain in labor productivity may not be as effective as that of a 5% gain in log productivity.



“...to lower the production cost over time requires continuous improvements in operations...”

**Application of principles**

Now that I have explained the situation of the hardwood sawmills, we can apply the same principles to panel production. What is its cost structure in terms of wood, glue, processing, and overhead? Which one presents the most inviting target? Do you reduce the cost of panel production by using cheaper glue? What if a 10% more expensive glue could allow you to reduce the amount of glue

used from 6% to 5% of the weight of the furnish?

Now, more than ever, it is important for manufactures to examine where their money is going and how they can make every cent count. Do take time to examine what your cost structure is like. Once that is done, it will be easier to see what areas need to be targeted. **PFA**

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