

Economic Environment

"Using Product Life Cycles & S-Curves to Adjust to Technology, Markets & Competition" by Al Schuler

REVIEW OF 2000

INTRODUCTION

Engineering advances are the theme for this issue of *WOODWORDS*. Therefore, I would like to focus on how to track the construction industry's adoption of "engineering advances" as it adjusts to new market realities like labor shortages, the disappearance of old growth timber, the introduction of alternative building materials and the constant need to increase productivity while remaining profitable. We have discussed various aspects of these subjects in previous issues of *WOODWORDS*, but in this issue we will focus on selecting a framework for linking markets, competitive forces and adopting technology or "engineering advances." We will introduce two closely related analytical tools—the Product Life Cycle and the "S-Curve"—that have been used successfully by other industries to assess how economic and other market forces drive technological change.

THE TOOLS

The Product Life Cycle (PLC) represents the sales history of a product, a product-class or even an entire industry (Sinclair, Forest Products Marketing,

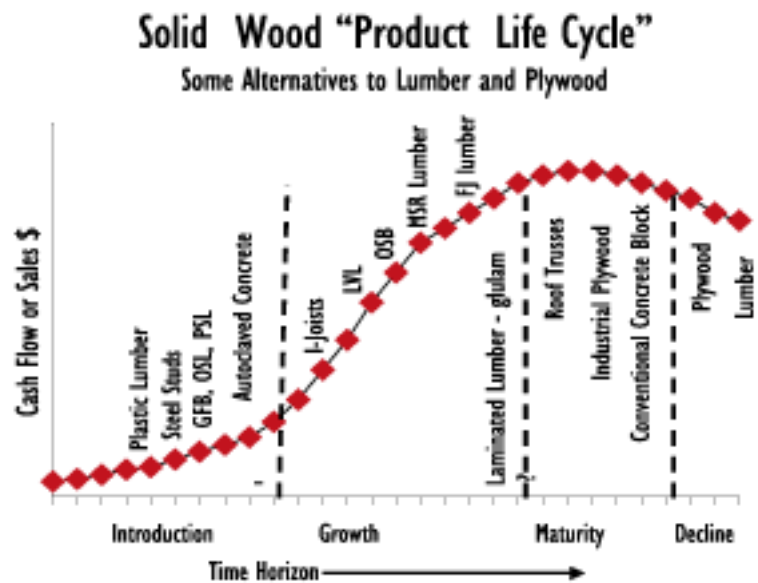


FIGURE 1
CLICK ON IMAGE FOR LARGER VIEW

1990). It has four distinct stages: introduction, growth, maturity and decline. In Figure 1, I have developed a crude PLC for solid wood products and their substitutes in structural market applications. The PLC is an extremely useful strategic planning tool because it helps link technology, markets and competitive forces thus forming a basis for forecasting and strategy development (Day, Analysis for Strategic Marketing Decisions, 1986).

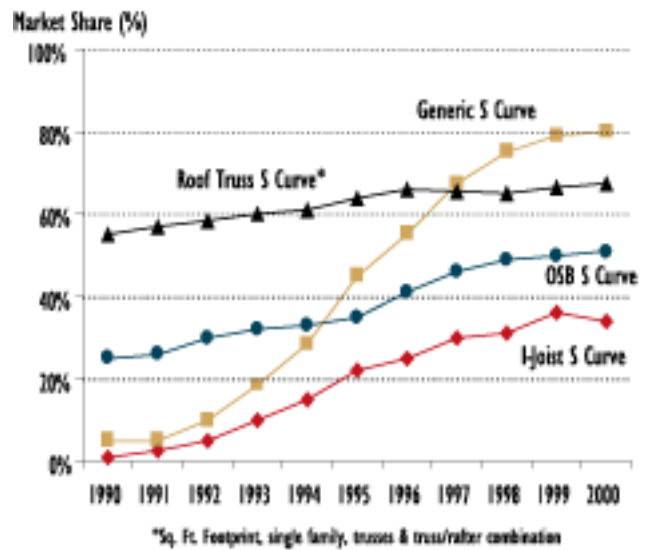


FIGURE 2
CLICK ON IMAGE FOR LARGER VIEW

Just as productivity is the key to a higher standard of living in the economy* it is also essential to keep the building industry healthy over time. A recent survey by the National Association of Homebuilders (NAHB) titled, Labor Shortages and Productivity in the Home Building Industry, suggests that labor productivity in the construction industry is either stagnant or growing very slowly. This presents a serious threat to the economic vitality of this key sector of the economy. The report went on to identify the following reasons for this stagnation: demographics, * lack of job security, poor working conditions, poor image, fragmented industry, poor benefits, seasonal conditions, low innovation, and the list goes on. A companion report from NAHB titled, The Next Decade for Housing, suggests that custom built housing trends, requiring more skilled labor, will only exacerbate the "labor problem."

U.S. Softwood Lumber Consumption by Product - 1999

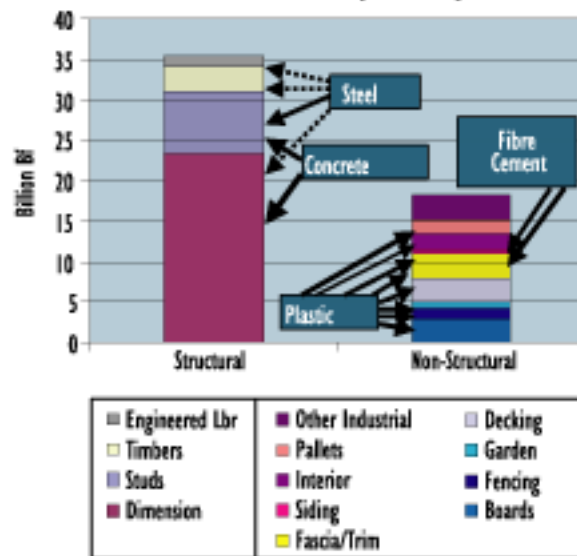


FIGURE 3
CLICK ON IMAGE FOR LARGER VIEW

The shortage of skilled labor isn't the only problem changing the face of homebuilding. The NAHB report further Economic Environment suggests that the homebuilding process will continue to evolve as constraints on timber supplies encourage an increased use of engineered wood products, steel, concrete products and plastics. Trends toward labor saving automation will continue as more of the house is built "off-site," within the friendly confines of a factory.* Currently, even site-built housing usually includes some "off-site" components such as roof trusses.

An "S-Curve" is an analytical tool that is closely related to the PLC (see Figure 2). The basic S-

Curve illustrates a product's market growth over time. Many products have been found to follow the "S" shape—starting slowly, then quickly grabbing market share, reaching a maximum share, and finally, beginning a decline. Products differ mainly in the amount of time it takes to move up the curve. For example, OSB captured 53 percent of the structural panel market from plywood over the past two decades while I-Joists have captured 35 percent of the floor joist market from large-dimension lumber in the past ten years. Roof trusses, a relatively more mature product, entered the housing market in the late 60's, and by the late 70's were the dominant method for framing gable roofs (Robichaud, Forintek 2001). How much further will they go? How long will it take? Most products "max out" somewhere between 70 and 80 percent of the market (Controlling 100 percent of the market is highly unusual because of consumer preference. For example, some builders will never switch to OSB or I-Joists). Similar S-Curves can be developed for other products to help answer questions like: How much market share will modular housing techniques capture? Panelized housing? Roof trusses? Autoclaved concrete systems? Steel studs? Plastic lumber? How much market share will LVL capture in the beam market? How fast will these products capture market share?

When using S-curve analysis for products, make sure to consider regional differences. For example, Figure 2 shows the national roof truss S-curve flattening or "peaking" somewhere between 65 to 70 percent. However, the regional comparisons give a different picture. A study by the NAHB Research Center, for the Wood Products Council, found that the market share (square foot roof print) for trusses and truss/rafter combinations in single-family housing was only 50 percent in the South in 1998, compared with 88 percent in the West and 70 percent in the North. In other words, there seems to be considerable growth potential for roof trusses in the South. The same is true of I-Joists in that there is much heavier usage in the North and West compared with the South. Some possible reasons for regional differences are builder preference, labor rates and the degree of unionization. It is interesting to note that the regional growth patterns for OSB were similar in all areas—OSB has captured over 50 percent of the market share in all regions of the U.S.

CONCLUSION

So, where am I going with this? The homebuilding industry, like building products manufacturers, is not as static as we may think. Copious changes are taking place with construction methods, materials and labor. Whether you manufacture lumber and panels, distribute wood based products, manufacture steel building materials, manufacture/distribute structural components or design structural building components—if you want to prosper, you need to anticipate where your customers and industry are headed, and, more importantly, why. Make sure you are part of their future. Substitution is the vehicle of change, and softwood lumber has seen its share of competition in both structural and non-structural markets (see Figure 3). We can use PLC and S-Curve analysis to evaluate substitution trends for any products, group of products, building techniques, etc.

See where you are and where your competitors are! Discover if it is time to develop new products or start doing things differently. Nothing is static, and the sooner you recognize change the better able you will be to cope with it and take advantage of it. Managing change can be and should be a strategic business advantage.

For more information on this topic please refer to the following issues of *WOODWORDS*: [April 2001](#), [August 2000](#) and [March 2000](#).

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