Two Out of Three Ain't Bad: **5 June 2009**

Effects of Weather Conditions on Southern US Pine Log Markets

Everybody knows that when it rains prices for pine logs go up, right? Everyone has stories how log prices skyrocketed while water came down in sheets and put roads underwater. Further, if you ask why mills build wet weather inventory the answer is because when it gets wet it's harder to get in the woods, and harvest falls along with mill deliveries. But wait a minute, if someone announces a mill curtailment, volume delivered falls and with it prices. On the flip side, if someone announces a new mill or mill expansion, volume delivered increases and with it, prices. After all – that's basic economics: supply and demand. When volume delivered increases, that indicates more demand, and so prices go up; when volume delivered decreases, that indicates less demand, and so prices go down.

If you think about this for a moment you realize that at least one of the relationships just described can't hold true. If wet weather tends to reduce harvest levels and harvest levels tend to move in the same direction as price, then how can price increase with wet weather, or decrease with dry weather?

Statistical analysis of Forest2Market®'s stumpage data for the southern U.S. does indeed suggest that only two of these three relationships seem to be true. Weather conditions and harvest levels are inversely related – drier conditions tend to promote harvest opportunities while wetter conditions tend to constrict them. Also, in general, higher harvest levels seem to indicate more demand and so price has a tendency to increase. This isn't always the case – sometimes harvest levels are high for other reasons: hurricanes, or southern pine beetle salvage; but in general, harvest is indicative of demand pressures, not supply.

However, the last relationship – where more rain drives up the price of logs – isn't supported by Forest2Market's data. Instead the statistical correlation between the two factors is negative, indicating in general that the lower the amount of rain, the higher the price. Probably one factor to keep in mind is that most war stories of high prices during wet weather periods are for delivered timber, not stumpage sales that might be harvested anywhere from 10 days to 12 months later. However, as we dug deeper we found there is much more to this story – a third relationship: average log size, measured by tree DBH, and average log price.

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While the strength of the DBH-price relationship varies by market across the U.S. South, in general there is a strong positive statistical correlation between average monthly log size and average monthly log price (i.e., larger logs command higher prices). This relationship is generally even stronger if you break down the analysis to look at individual sales instead of monthly averages. It is our experience that when wet weather arrives, the tracts that are harvested are generally those that have good road access on well-drained ground – in short, places that are more frequently harvested. On the other hand, when conditions get dry, logging operations will often press into places that aren't often able to be worked – in short, places that are less frequently harvested. In general those more accessible areas will have smaller-sized timber and those less accessible places will have larger-sized timber. It is this DBH/log price relationship that explains why log prices fall when conditions are wet and log prices rise when conditions are dry: log size falls when conditions are wet and log size increases when conditions are dry.

Forest2Market's benchmark price adjusts the reported market price for changes in log size so other factors affecting market behavior other than changing log size can be better understood. So, looking beyond the reported market price to the benchmark price removes the three-way interaction between weather, log size, and log price, focusing only on weather's influence on price. When focusing on benchmark prices alone the market follows the conventional wisdom: benchmark prices for logs tend to rise when weather conditions are wet and fall with weather conditions are dry. But how does that fit with lower volume deliveries? This is a case when lower volume actually relates to less supply, not less demand. Wet weather restricts supply by limiting access. So, even though log size and log price both fall, the benchmark price rises due to temporarily reduced log supply.

We believe to properly understand local pine log market conditions it's necessary to consider the factors affecting log size, reported market price, and benchmark price; all three are important. That is why 4Cast[1] includes projections of all three. Anticipating changes in average log size across the market can affect the tracts you sell or buy and the products you make. Understanding reported – or what we refer to as "composite" (it's a composite of the all market transactions, not corrected for log size) – market price affects your business' bottom-line: revenues, cash flows, inventories, and loan obligations. Understanding benchmark prices gives insight into market fundamentals and direction by adjusting composite market prices for log size.

Weather conditions definitely play a role in influencing stumpage prices, but their effect is not what is generally expected. Log price, rainfall levels, and harvested volume do not uniformly increase or decrease, but two out of three move in the same direction. However, the interactions among all three are predictable, and by using that knowledge Delphi Advisors is able to help both timber sellers and buyers more effectively manage their supply chains.

[1] For more details about 4Cast see http://www.delphiadvisors.com/servicenotes.html