Globalization, Demographics, Technological Change & other Factors Impacting Demand for U.S. Wood Products: Implications for Softwood Fiber Markets?

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Outline

• I. Introduction – Globalization and demographics are changing the competitive landscape today much like environmental issues did in the last decade.

• II. Is U.S. forest products industry still competitive? - overcapacity and more intense international competition from both inside and outside the forest products industry has led to loss of market share (offshore and domestic), lower profitability, job losses, forest ownership changes, etc. Is the U.S. forest products industry losing its competitive position in commodities? What are implications for stumpage prices and land values?

• III. More on Survival strategies – “no silver bullet – different strokes for different folks” - consolidation; joint ventures; retrenchment to “core business”; outsourcing; change businesses; move up the value chain; get closer to your customers (move down the supply chain – move away from wholesale to retail).
  – Two interesting results:
    • Secondary industry growing much faster than primary industry – could lead to lower demand for fiber?
      - housing market example
      - furniture industry example
    • More forest product companies are rethinking their core assets & selling their forest land holdings to generate cash to invest in core business & pay down debt

• Bottom line – The world is changing! U.S. forest products industry can’t continue doing the same things the same way and expect business to get better – paradigm shift/ new business model(s) needed? Potentially major implications for domestic timber markets?
Part I - Key Trends Changing the Landscape

Environmental Issues:

Globalization:

• U.S. forest products industry is hurting – both primary and secondary sectors
• China: Market or Competitor?
• What role will Russia play in the future?
• International trade accounting for increasing share of global wood products consumption
  30% of paper & wood products and 7% of roundwood production (and it is growing)

Demographics:

• Aging population forcing changes to way we build houses
  factory built components; turnkey programs; substitution – more engineered wood products

Source: Al Goetzl, Seneca Associates
Total Timber Harvest - Public & Private
Washington & Oregon

Land Management Philosophy on Public Lands Changed

Two major impacts:
- Total harvest down 50%
- Private share now about 80%

"Spotted Owl Effect"

Source: USFS (PNW–RB-239, June 2003)
Cost Comparison - Plywood vs OSB
How the forest products industry adapted to a change in resource availability

Curtailments in western public timber harvests doubled Western plywood costs and forced Southern plywood Costs up by over 60% while OSB costs are up less than 25% over the same period

Source: RISI NA Wood Panel Historical Data 2003
North American Structural Panel
Market Share Shifts: big shift in demand for fiber from veneer/peeler logs and sawlogs to pulpwood, Thinnings - Both hardwood and softwood species

OSB technology more in tune with today’s resource supply
Same story for other EWPs

Source: APA, Market Outlook, Sept. 2002
The industry has lost 95,000 jobs since 1999.

As domestic furniture production drops, Big potential impact on Hardwood lumber demand? PB? MDF? Veneer? Other supply chain partners?
Wood Furniture – 40% and growing!
US Hardwood Exports to China

Source: DOC
Russia also investing heavily in new sawmill capacity. Geared primarily for export markets formerly supplied by USA and Canada.

Source: FAO
New Forestry Code to Make Russia World's Largest Timber Producer

Rosbalt Newswire

MOSSCOW, February 3. Russian Minister of Economic Growth and Trade German Gref hopes that once the Russian government approves the latest forestry code Russia will become one of the most powerful countries in the world in terms of timber production and processing. As a Rosbalt correspondent reports, he made this announcement yesterday after a discussion of the proposed code.

In the minister's opinion, the new code will stimulate a considerable rise in GDP. "It is one of the key factors that could bring a substantial rise in national GDP," Mr Gref said. Russian forests have a large economic potential.

'It is difficult to overestimate the significance of the new code as it is the catalyst for commercializing the entire industry of timber production," he said. Mr Gref stressed that at present there is a lack of investment in this sector due to the absence of laws and guarantees protecting those who are active in the industry. "At present people only lease forestry on short-term agreements and so there is no large-scale investment," the minister explained. "The leading enterprises in the timber sector have been awaiting this document and now see more potential for investing in the national timber processing industry."

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World’s Leading Wood Product Importers

30% (and increasing) of global wood products consumption sourced from international trade

Source: Global Trade Atlas
U.S. Labor Force Demographics

Implications of an older labor force?
More expensive labor!!!
Mandates automation! – manufactured housing, Components (trusses, panelized wall systems, etc.)
Potentially big impact on timber markets!!!!

Share of employed civilian labor force

Source: (www.economagic.com/em-cqi/data.exe)
Part II. Is U.S. Still Competitive in Wood Products?

1. Fiber cost is key to being globally competitive if you’re in the commodity wood business (all products eventually become commodities - it’s just a matter of time)
2. World Fiber Glut???
3. Globalization, Plantations, Timberland returns, and Forest Land Ownership
4. Trade in Wood Products
5. Employment trends
Fiber as % of Mill Gate Operating cost Primary Industry

Source: RISI, CIBC World Markets
Fiber as Percentage of Manufacturing Cost – Secondary Industry

Source: Kline, Cumbo, VanAiken; VPI, Blacksburg, VA
Global Whitewood Log & Sawmilling Costs – 2000 US$/MBF (Nominal size)

North America will have problems competing on price!!

Source: PWC & R.E. Taylor
Softwood Delivered Sawlog Cost
1Q, 2003

Source: Wood Resources International, Ltd.
Delivered Roundwood Pulpwood Cost
1Q, 2003

$/M³

Source: Wood Resources International, Ltd.
Timber Glut Looming???

Implications for Commodity Prices (plus Timber & Forest Land)

Million cubic meters

Source: U.S.A. - AF&PA; others - R. Taylor, WMM, 2/2003; UN/ECE
Other than the brief 1995 spike, *global* wood fiber prices have been trending lower since 1991, as plantations continued to expand globally . . .
Global Plantations – Implication for Forest Land Ownership, Stumpage Values, & Land Values in the U.S.?

32 million acres of pine plantations in the U.S. South
Impact on stumpage prices – impact on the small Non-industrial landowner????

Source: FAO FRA 2000
The downward drift in pulpwood value was associated with a downward drift in the income and appreciation value of U.S. timberlands... leading some to question the long-term sustainability of extensive forest management in the private sector... Timberland returns are an issue...
Appreciation Increases have Flattened since 1995

Timberland Appreciation

Source: National Council of Real Estate Investment Fiduciaries

Source: Jack Lutz, James Sewell Company, National Council of Real Estate Investment Fiduciaries
Timber Prices & Timberland Values are Correlated

Source: National Council of Real Estate Investment Fiduciaries, Timber Mart-South, Log Lines

Source: Jack Lutz, James Sewell Company, National Council of Real Estate Investment Fiduciaries
Shifting Timberland Ownership in U.S. -- Publicly Traded Companies*

Traditional forest industry acres declining, Prompted by:
- Tax policy
- Global fiber competition
- Higher per acre productivity (plantations)
- Low market valuations
- Need for cash to reduce debt & support core business

Companies listed on major stock exchanges.

Source: Al Goetzl, SEC Filings & Business Publications
Weyerhaeuser Sells 160,000 Acres Forest land in Carolinas to Reduce Debt – Previous month they sold 168,000 acres in TN

December 12, 2003

Weyerhaeuser to sell timber land in Carolinas

FEDERAL WAY - The Weyerhaeuser Company is selling about 160-thousand acres of forest land in western North Carolina and South Carolina.

An agreement to sell the land to Forest Investment Associates of Atlanta was announced today.

The Federal Way based company says the deal is expected to yield about $140 million after taxes, and the money will be used to reduce corporate debt.

The sale is expected to close by Wednesday. Earlier this month Weyerhaeuser sold 168,000 acres of forest in Tennessee to a Florida company.

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Boise Cascade to Exit Forest Products Business?

Many analysts expect firm to shed lumber, paper divisions

Ken Ivey
The Idaho Statesman

Two years ago, Boise Cascade Corp. dropped the tree from its logo.

Now, on the eve of a shareholder vote that will likely approve the company’s acquisition of OfficeMax Inc., many are wondering if Boise Cascade is poised to end its traditional role as a timber company once and for all.

Is Boise Cascade’s foray into the retail office products market the beginning of the end for Boise Cascade’s traditional lumber and paper divisions?

Many analysts believe the answer is yes.

How that could affect Boise Cascade’s future and its more than 1,000 employees in Idaho also is uncertain.
Certified Lumber Trends
Despite falling stumpage prices, landowners may be forced to manage forest land more intensively or lose customers???

International Report

Home Depot to provide more FSC-certified lumber

Atlanta - December 4 - Home Depot said it would provide customers with larger amounts of FSC (Forest Stewardship Council) certified SPF (spruce, pine, fir) lumber through an agreement with Tembec, the Montreal-based forest products company. According to Jim Lopez, president of Tembec Forest Products Group, more than 25 percent of Tembec's Canadian forest operations are FSC certified.

In 1999, Home Depot issued a wood purchasing policy that gives preferential treatment to suppliers that offer certified wood prod ... Complete Story
What Does Shift in Timberland Ownership and/or Profitability Mean???

• Fewer acres available for fiber production?
• Will the new owners manage the land??????
• What about the smaller private non-industrial forest land owner?? – Lower stumpage prices mean lower returns!! Where’s the incentive to practice forest management?????
• Implications for forest health/sustainability??
• Healthy forest products industry depends on healthy forests and vice versa
Are We Competitive??
International Panel Markets
Reduced demand for U.S. wood products - implication for timber markets?

Overseas Shipments from U.S. and Canada

Source: APA
North America Imports Not from U.S./Canada

Future depends on exchange rates and comparative advantages.

And, APA forecasts we will be importing 1 Billion SF of structural panels from offshore sources (Brazil/plywood and Europe/OSB) very soon – Reduced demand for U.S. Timber!!

Mostly Ireland, France & Germany

Mostly Brazil and Chile

Million Sq. Ft. 3/8"

'99 '00 '01 '02 '03 estimate

Softwood Plywood
OSB
U.S. Softwood Offshore Exports

Fiber Market Impact - *Reduced Demand for U.S. Logs and Lumber*

Problems – Same as panels:
- Competition from European domestic sources for European markets
- Competition from Europe, Russia, Oceania for Japanese and Chinese market

Source: Random Lengths
U.S. Softwood Lumber Import Market Share

Fiber Market Impact – Reduced demand for U.S. logs and lumber

Source: AF&PA
**U.S. Off-Shore (non Canadian) Softwood Lumber Imports**

**Fiber Market Impact - Reduced Demand for U.S. Logs and Lumber**

<table>
<thead>
<tr>
<th>Year</th>
<th>Billion BF</th>
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<tbody>
<tr>
<td>1991</td>
<td>0.01</td>
</tr>
<tr>
<td>1993</td>
<td>0.51</td>
</tr>
<tr>
<td>1995</td>
<td>1.01</td>
</tr>
<tr>
<td>1997</td>
<td>1.51</td>
</tr>
<tr>
<td>1999</td>
<td>2.01</td>
</tr>
<tr>
<td>2001</td>
<td>2.51</td>
</tr>
</tbody>
</table>

From Where:

- **Brazil**: 20%
- **Germany**: 17%
- **Sweden**: 14%
- **Chile**: 14%
- **New Zealand**: 13%
- **Others**: 22%

Source: A. Goetzl, Seneca Associates
The industry has lost 95,000 jobs since 1999.

Source: Bureau of Labor Statistics
BLS Series – Logging & Wood Products
As domestic furniture production drops, Big potential impact on Hardwood lumber demand? PB? MDF? Veneer? Other supply chain partners?
Part III. – More on Survival Strategies for U.S. Wood Products Industry

- Many key wood products are “mature” – we need replacements to hold onto key markets or risk losing market share – **Engineered wood products gaining – potentially big impact on fiber demand – species, size, quality!!!**
- Globalization is creating new competitors (wood & non wood) for the wood products industry
  - Housing industry case study – demographic shifts causing labor shortages & this is precipitating changing building technology – new products & systems (not necessarily wood)
  - Furniture industry case study – 50% market share loss in past 15 years – Big potential impact on supply chain (lumber, veneer, & others) – forcing changes in way we make, market & distribute furniture - lean manufacturing, more components, are part of their future
- These changes are already impacting timber markets
Building Materials “Product Life Cycle”

Alternatives to “mature” Lumber and Plywood - conventional wood expected to continue losing market share to materials with less maintenance, stronger, predictable performance, … these new products can impact forest landowners and timber markets substantially!!

Source: USFS
North American Structural Panel

Market Share Shifts: big shift in demand for fiber from veneer/peeler logs and sawlogs to pulpwood, Thinnings - Both hardwood and softwood species

Source: APA, Market Outlook, Sept. 2002
Engineered Wood Products (EWP)

- LVL
- OSB
- Wood I-Joist
- Oriented Strand Lumber

Source: APA
EWP Plants in North America Have Doubled in Past Decade

Source: APA
Engineered Wood Products

Now over 5% of Lumber supply – shift in demand for fiber from sawlogs/veneer logs to smaller diameter trees and previously unwanted species

Million BF Eqvt. (LVL: CF=16BF; I-Joists: LF=1.68 BF)

LVL+ Glulam + I-Joists = 5% of Lumber Supply

Source: APA, Report E68
EWP give higher yields from the log – that means less waste and lower manufacturing cost – Timber Markets? – Increase demand for smaller logs, more species, more hardwoods, and created market for thinnings in some instances

Source: TJ Weyco, USDA FS, Norbord Industries
Standardized products will lead to successful wood systems that can compete with steel and concrete.

Source: APA
Efficiency Advantages – EWPs

**Fiber Savings**

**Conventional Floor System**
- 85 2x10’s; 133 pieces total
- 1700 lineal feet/house
- 2700 board feet/house
- With 1.3 million single family houses, consume 3.5 BBF/year

**I-beam system – now have over 45% of the wood floor market**
- 26 I-beams; 80 pieces total
- 50% savings in wood fiber
  (Spelter, 1997 FPL GTR 99)
  19.2 “ OC, LVL flange, same subfloor thickness, OSB web)

- Save 1.7 BBF annually in single family construction
Solid Wood – Too Many Eggs in the Residential Basket: Globalization Simply Exacerbates the Problem by Adding to Overcapacity & Giving Customers More Choices (including non–wood)

1. 75% of our Products – Go To Residential Construction End Uses – Every wood producer in world looking at U.S. residential market
   Our wood products industry vulnerable to any changes in the status quo (including more imports)

2. Residential Construction Industry is Adjusting to labor shortages and other challenges by changing building techniques
   Help your customers solve their problems – (or they will “partner with someone else” – steel and concrete, etc)

3. Big potential impact on timber markets and landowners as construction techniques change as do new building materials
United States Wood Products Consumption –
75% go to residential markets
a lot at stake here if housing industry starts shifting
away from wood building materials/systems

2002 Softwood Lumber
52.6 BBF (128 million Cubic Meters)

2002 Structural Panels
37.1 BSF(3/8) (33 million Cubic Meters)

*New Residential incl. SF, MF, and Mobile Homes

Source: APA & SFPA, Market Outlook, September 2002
U.S. Labor Force Demographics

Implications of an older labor force?
According to Nat. Assoc. Mfg., there will be skilled worked gap
of 5.3 million by 2010 growing to 14 million by 2015!!
Mandates automation! – manufactured housing,
Components (trusses, panelized wall systems, etc.)

Share of employed civilian labor force

Source: (www.economagic.com/em-cgi/data.exe)
Replacing Workers Leaving the Trades is a Constant Challenge

We need to find 27,000 new carpenters every year. This will drive demand for easy-to-install components and systems. Fewer people on the jobsite.

Labor Cost Advantages for Manufactured Housing –

Direct Labor share of costs (excl. finished lot and gross margins)

Source: Hallahan Associates, November 2000
### Estimates of U.S. Homebuilding Methods

<table>
<thead>
<tr>
<th>Method</th>
<th>1997 # Units</th>
<th>1997 %</th>
<th>2002 # Units</th>
<th>2002 %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stick Built¹</td>
<td>1,175</td>
<td>79.7%</td>
<td>1,195</td>
<td>70.0%</td>
</tr>
<tr>
<td>Panelized²</td>
<td>105</td>
<td>7.1%</td>
<td>230</td>
<td>13.0%</td>
</tr>
<tr>
<td>Concrete³</td>
<td>125</td>
<td>8.6%</td>
<td>210</td>
<td>12.0%</td>
</tr>
<tr>
<td>Modular⁴</td>
<td>45</td>
<td>3.1%</td>
<td>35</td>
<td>2.0%</td>
</tr>
<tr>
<td>Steel Frame⁵</td>
<td>8</td>
<td>0.5%</td>
<td>14</td>
<td>0.8%</td>
</tr>
<tr>
<td>SIPs⁶</td>
<td>8</td>
<td>0.5%</td>
<td>12</td>
<td>0.7%</td>
</tr>
<tr>
<td>Other⁷</td>
<td>8</td>
<td>0.5%</td>
<td>9</td>
<td>0.5%</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>1,474</strong></td>
<td><strong>100%</strong></td>
<td><strong>1,705</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Trading places: Stick building decline offset by panelization

The trend to panelization means that builders are taking steps to streamline building and lower jobsite cost.

Concrete & steel are growing. Share growth of these two is a “wood loss” of about 15,000 starts per year.

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¹ stick built walls and floor with prefab roof trusses, ² panelized wood walls built in factory, ³ block or poured concrete walls, ⁴ factory built modules (not HUD), ⁵ steel framing used for at least exterior walls, ⁶ foam core with structural panels, ⁷ log homes, post & beam, etc. ⁸ HUD code

Source: APA, Report E169, April 2003
Modular Construction to Reduce Waste, Labor Content, Cycle Time

Source: Courtesy of Cardinal Homes
Factory Built Walls and Glulam Beams to Reduce Waste, Labor Cost, & Cycle Time

Source: APA
Lumber Component Industry – Impact on timber markets?

Trusses and wall panels are more efficient building techniques; use less lumber volume, and make more effective use of small, lower grade wood products (2x4s and 2x6s) than larger, higher quality boards otherwise needed in floor & roof systems.

Gross sales, US$ Billions

U.S. Shipments: Softwood Lumber versus Residential Components*

Shipments, $ Billion, FOB mill

Secondary industry often uses smaller Trees, different species, lower grades…
Big Impact on timber markets!!!

Source: U.S.Census

*Includes: Wood trusses (NAICS 321214), EWP (321213), Prefab wood buildings (321992), (precut, panelized form, modular), Excludes components used by HUD code manufactured homes
## Demand* Factory Built Housing Components

--- | --- | --- | --- | --- | ---  
**Total** Factory Built | $6230 | $10350 | $13050 | $16900 | $22550  
Site Built Only | 4950 | 7590 | 10600 | 12850 | 17100  
Roof trusses | 3355 | 4900 | 6315 | 7040 | 8620  
Floor trusses | 445 | 775 | 1135 | 1500 | 2050  
Wall & Partitions | 450 | 775 | 1345 | 1780 | 2590  
I-Joists | 135 | 310 | 555 | 900 | 1460  
All others | 565 | 860 | 1250 | 1630 | 2380  

*demand = shipments plus imports – exports, all valued at the manufacturers’ level; Fredonia Group, "Factory Built Housing", 2003; **Total demand includes HUD code
Globalization (Overcapacity) Forcing Steel Industry to Look for New Markets

If builders and wood products suppliers don’t solve the labor cost, waste, and other problems, someone else will – steel penetration stabilized during 2000-2002 as lumber prices fell.

Tons of steel in site built Residential construction
All steel framing applications

Source: SFA, 2003
Globalization Forcing Concrete Industry to Look for New Markets

Multi- & Single Family Residential Structural Materials
(Floors, Walls, & Roofs)

Source: NAHB - RC
Japan Precut Homes Increasing
Resulting from demographics, new govt. building regs – Quality assurance law, 10 year home warranty program, Kobe earthquake

Post & Beam construction is moving to factory components with CAD, cut to length, machine cut mortise and tenon, numbered parts, using more glulam and engineered wood products.
Impact of More Prefabrication in Japan Drives Use of Glulam & Laminated Lumber – Impact on Timber Markets??

Laminated structural lumber increasing at 10% - 15% annually

Thousand cubic meters

- Domestic production
- Imported laminated lumber
- Imported Glulam Beams
More Prefabrication Means Less Japanese Log Imports

Source: JAWIC
More Prefabrication Means Fewer Japanese Imports of Softwood Lumber

Source: JAWIC
Wood Household Furniture Imports
Gaining Market Share* - The problem is spreading to Upholstered and Office furniture

*These market share % are conservative because Consumption is overstated as some imported components
And finished furniture is included in the domestic shipments

consumption = shipments + imports – exports. Import share = imports/consumption

Supply Chain Impacts (and impacts on timber markets and forest landowners)

As the furniture industry shrinks, other industries are impacted

> primary lumber industry
> furniture components, dimension lumber, and the pallet industry
> Veneer
> Particleboard and MDF
> Stumpage/timber markets
> Land values
> .......
Summary Comments

• Globalization plus productivity increases = overcapacity in commodities – pulp & paper and wood products
• Eventually, all products evolve to commodity status – some faster than others - “Grow the Pie” to reduce competition and increase profits
• Globalization (more competition) is impacting forest land values as companies adjust and rethink their core business & assets – some companies are selling some or all of their forest land to reduce debt and reinvest in “core businesses”
• Today’s Customer has more choices – puts them back in the driver’s seat – they want you (the supplier of building materials and other wood products) to help them stay profitable in the midst of challenging issues (e.g. chronic skilled labor shortages) – “partnering’ will become a big issue – more value added processing – secondary industry grows faster than primary sector!!!!
• Solutions (to globalization pressures) depend on SWOT analysis – different strokes for different folks – can’t keep doing same things same way and expect improvement – paradigm shift or new business model required for some industries – changing nature of competition with more focus on innovation, product and market development – Is the forest products industry ready??
• Best strategy is keeping your key customers happy (and doing so profitably). **They are changing the way they use wood products – make sure you are aware of these changes!!!!!!**

• Two relevant case studies:
  – Home construction (destination for 75% of solid wood products) industry facing tough challenges driven by demographics and globalization forces
    • Adjusting with new construction methods and materials
    • Globalization creating new competitors (steel, concrete, plastic, imported wood products) – wood products industry must become more innovative to retain markets and customers
    • **EWPs will gain favor** – greater demand for smaller trees, thinnings, more usable species as new conversion technology is not as species dependent, etc.
  – Furniture industry under siege from cheap imports
    • Paradigm shift required for survival – mass customization, lean manufacturing (similar to auto industry) major implications for supply chain (lumber industry, MDF, PB, veneer, etc.), distribution, marketing, design
• Big potential impact on timber markets and forest landowners as the U.S. wood products industry adjusts – ex. More engineered wood products means shift in demand from larger trees (veneer and sawlogs) to smaller trees (pulpwood, thinnings); wider range of desirable species (ex. more hardwoods) as new conversion and manufacturing technology is “less species specific”; shorter rotations; ....... Also, more use for EWPs hopefully will help compensate for loss of pulpwood demand in areas where pulp mills have closed!

• If we (researchers, Universities, equipment manufacturers, governments?, etc.) don’t work with our industry to help them to become more competitive, there will be big consequences for fiber demand, stumpage values, and land valuations.

• Bottom line – U.S. wood products industries (both solid wood and pulp and paper) losing competitive position in world markets – Some of the impacts include shifting international trade flows; reduced profitability at home; lower domestic stumpage prices?; and a rethinking of forest land as a strategic asset.