Global Industry Outlook: A Platform for Innovation?

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Mill Intelligence Service: costs & profits, projects, equipment, and capital investments for 4,500 global mills.

Industry Events: regional outlook conferences and topical events located on every continent.
Agenda

• Global macro-economic snapshot

• (Abridged) industry outlook

• Perspectives on innovation
Global Economy Growing Moderately, with Heightened Risks

Annual Real GDP Growth

USA
- 2.4% (2014)
- 2.4% (2015)
- 2.6% (2016)
- 2.5% (2017)

Euro Area
- 0.9% (2014)
- 1.5% (2015)
- 1.6% (2016)
- 1.3% (2017)

Latin America
- 1.3% (2014)
- -0.4% (2015)
- 0.1% (2016)
- 1.8% (2017)

China
- 7.3% (2014)
- 6.9% (2015)
- 6.4% (2016)
- 6.1% (2017)

Source: IMF, RISI
Developed Economies Leading Global Growth...

Global Real GDP* Growth

*Measured at purchasing power parity exchange rates

Source: IMF, RISI
...While Emerging Markets Have Slowed...

Annual Real GDP Growth

Source: IMF, RISI
...As Commodities Have Fallen...
Percentage Change Since July 2014

Crude oil  |  Iron Ore  |  Nickel  |  Copper  |  Tin  |  Zinc  |  Aluminum
-80%      |  -70%      |  -60%    |  -50%    |  -40% |  -30%  |  -20%
...And Currencies Have Crumbled
Percentage Change Since July 2014 Versus US Dollar

- Russia: -60%
- South Africa
- Brazil
- Mexico
- Turkey
- Chile
- Euro
- Japan
- Indonesia

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Oil Prices Staying Low on Oversupply

Brent North Sea Crude Oil, Price per Barrel

Source: Energy Information Administration, RISI
The US Economy

USA – “Oasis of Prosperity”? 

• Partially decoupling from rest of world
• Domestic-based growth is healthy
  ▪ Employment and wage growth
  ▪ Cheap energy
  ▪ Housing
• Non-domestic side of economy struggling
  ▪ Manufacturing
  ▪ Exports
2015 Was Another Year of Healthy Job Growth

Change in US Total Payroll Employment, Millions

Source: Bureau of Labor Statistics
Eurozone Economy Growing, But Weakly

Annual Real GDP Growth

Source: IMF, RISI
Hard Landing for China Is Unlikely
Real GDP Growth, Annual Percent Change

Source: NBS, RISI
Industry Outlook Overview

• World demand continues to grow
  ▪ Although limited by uneven economic performance
  ▪ And competition with alternative products

• Producers reducing investment in new capacity
  ▪ Even in China as demand growth slows
  ▪ Shift toward M&A, especially in North America

• Becoming less “green” but more “sustainable”?
  ▪ Recovered paper usage slowing
  ▪ Wood pulp share of furnish stabilizing
  ▪ China at the center of this shift
Further Slowdown in World Paper and Board Demand Growth

- Usage limited by a number of factors
  - Sluggish performance of the general economy
  - Accelerating substitution by electronic alternatives
  - Pressure for lighter-weight grades
  - Shift in Chinese economy

- Global paper and board demand still rising
  - But only about 1% per year
  - Translating into 4 million tonnes annually
World Paper and Board Demand

Million Tonnes
Most of the Growth in the Industry Is in Packaging—Modest Effect on Market Pulp
Dramatic Slowdown in Chinese Paper and Board Demand

- Annual growth rate slowed to 2.2% in 2011-2014
  - From an average of 9.7% in 2001-2010
  - Slight uptick expected to 2.5% over next two years
  - Electronic substitution and shift in general economy

- Other developing regions will generate just as much growth as China
  - Led by Asian countries such as India and Vietnam

- Developed world demand will drop 1.9 million tonnes
  - Due to strong electronic competition
World Paper and Board Demand by Major Region

Million Tonnes
Containerboard Will Remain the Largest Grade

• However, growth has slowed sharply
  ▪ Due mainly to a significant downshift in China
  ▪ Along with light weighting around the world

• Other packaging and specialty grades maintain positive growth
  ▪ Increasing consumer packaging in developing world
  ▪ Expansion of specialty markets

• Graphic grades continue to decline, led by newsprint
  ▪ While tissue leads in growth rate but remains small
World Paper and Board Demand by Major Grade

Million Tonnes
Producers Throttling Back on Expansion Plans

• Even Chinese companies are spending less
  ▪ Although encouraged by forced closures of old mills
  ▪ Poor profitability across the whole grade spectrum
  ▪ Including tissue

• Producers in the developing world still adding capacity
  ▪ While keeping a wary eye on demand prospects

• Developed world still seeing some investment
  ▪ Conversion of graphic paper assets to packaging
  ▪ Installing new tissue machines
World Paper and Board Capacity Expansion
Million Tonnes
Slowing Recovered Paper Usage

• Mainly due to deceleration in China
  ▪ Especially in the containerboard sector
  ▪ Shift toward virgin boxboard for consumer packaging
  ▪ New tissue capacity almost entirely virgin based
  ▪ Drop in newsprint output

• Lower bulk recovered paper prices
  ▪ Encouraging new recycled containerboard capacity
  ▪ Along with demand for lighter basis weights
  ▪ Declining graphic paper usage supports high grades
World Usage of Recovered Paper and Wood Pulp

Million Tonnes
North American RCP Domestic Demand vs. Exports

<table>
<thead>
<tr>
<th>Year</th>
<th>Net Export Share</th>
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<tbody>
<tr>
<td>2000</td>
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</tr>
<tr>
<td>2005</td>
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<tr>
<td>2008</td>
<td>33%</td>
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<tr>
<td>2013</td>
<td>39%</td>
</tr>
<tr>
<td>2014</td>
<td>39%</td>
</tr>
<tr>
<td>2015</td>
<td>40%</td>
</tr>
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</table>
Bleached Hardwood Kraft Leading Wood Pulp Demand Growth

• Major positive factors include
  ▪ High furnish shares in tissue and virgin boxboard
  ▪ Substitution for other grades
  ▪ Woodfree papers taking share from mechanical

• Bleached softwood kraft still growing slowly
  ▪ Strength required in many paper grades
  ▪ Especially as basis weights drop

• Dissolving pulp slowing sharply
  ▪ Big drop in cotton prices and increased availability
  ▪ Weak performance for acetate tow
World Wood Pulp Demand by Major Grade
Million Tonnes
China Is Still Leading the Growth in Wood Pulp Usage

• Despite slowing paper and board output
  ▪ Tissue and virgin boxboard production increasing
  ▪ Closures of old capacity based on nonwood fiber
  ▪ Rising quality standards

• Asian developing countries using more wood pulp
  ▪ But limited markets compared to China
  ▪ Focus still on recycled packaging expansion

• Europe and North America sliding
  ▪ Decline of graphic paper
  ▪ Highly penetrated tissue and virgin packaging markets
Wood Pulp Demand by Major Region

Million Tonnes
Wood Pulp Production Will Continue to Shift to the Southern Hemisphere

• Brazil will be the epicenter of investment
  ▪ Extensive availability of low-cost fiber
  ▪ Weak currency and accommodative government
  ▪ High prices for green energy

• New projects in Chile, although more roadblocks
  ▪ Indonesian industry will expand
  ▪ Could Argentina finally develop?

• Softwood capacity will grow in Europe
  ▪ Older pulp mill closures release fiber
  ▪ Growing inventories from sound forest management
Wood Pulp Production by Major Region

Million Tonnes

[Diagram showing wood pulp production by major region from 2000 to 2017, with Latin America, Other World, Other Asia, China, Europe, and North America represented by different colored lines.]

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What does it mean for innovation?

- Commodity: cost and operational leadership
- Commodity: industrial-sized customer strategy
- Consumer-driven product and business strategy
- Conventional and radical technology intervention
Key Takeaways

• Global economy growing but unevenly
• Industry also growing but:
  Packaging gaining share
  China slow-down is far-reaching
  Other developing regions gaining relevance
• No shortage of opportunity for innovation
  Conditions create different pathways,
  Technology plays a key role in all of them

Thank you!