CONSTANT MOTION: AN INDUSTRY ON THE MOVE?

David McCoy
FUNDAMENTALS
Long-term demand ‘eras’

The mature era: 1980-2000

- The ‘mature era’ is one in which TiO\textsubscript{2} demand very closely tracked global GDP.
- GDP grew steadily, despite many upsets in the global economy (Cold War, Asian financial crisis, oil crisis, stagflation, rise of Japan).
- Global trade highly limited vis-à-vis today.
- US and European growth more closely coupled to global GDP.

The credit bubble era: 2000-2007

- The ‘credit bubble era’.
- Banks bundled mortgage backed securities with lower standard and allowed consumers in mature economies to use debt as an instrument for everyday purchases as well as high-cost durables.
- The rise of China – massive infrastructure investment; rise of the middle class.
- The credit-fuelled spending artificially drove up demand in many regions above historical GDP trends.

Global instability: 2008-2015

- China passed a significant stimulus that significantly drove up fixed asset spending in 2010/11. Credit spending slowed significantly due to tighter lending standards and market discipline (ex China).
- Significant year-on-year changes in demand were driven by supply concerns and then inventory build in the supply chain. The bust was as equally impressive as the boom.
- Substitution and thrifting have partially ‘reset’ global demand to a lower point.
Long-term global demand trends

Demand per capita versus GDP per capita: 1980-2020

- 1980-2000
- Credit bubble: 2001-07
- GFC: 2008-09
- China stimulus: 2010-11
- New normal: 2012-20
Long-term global demand trends

Demand versus urban population: 1980-2020

Demand, millions

Urban population, billions

© TZMI - NOT FOR REPRODUCTION

1980-2000
Credit bubble: 2001-07
GFC: 2008-09
China stimulus: 2010-11
New normal: 2012-20
Demand has shifted from mature economies in the Americas and Europe to emerging economies in Asia

- this trend is expected to slow down as China’s economy downshifts.

Asia became the world’s factory as global trade mechanisms were put in place to support the shift.

TiO$_2$ demand generally followed the expansion of the industrial base in Asia, and expansion of TiO$_2$ capacity in Asia (China specifically) provided domestic or regional supply for the new demand.
CURRENT STATE OF THE INDUSTRY
Summary of 2015

Trends

Closures by global producers

Sales decline

Resistance to closure by regional producers

Cost savings measures could ‘cost’ the industry

Commentary and observations

• Chemours shuts down its facility in Edge Moor, Delaware and Line 3 in New Johnsonville.
• Huntsman shut down the front end of the Calais site. With the finishing plant still operational, some portion of this capacity should still be considered ‘available’ to finish calciner discharge (‘raw pigment’) from other Huntsman sites.

• Demand declines in emerging economies were a result of economic weakness (and recession in some cases) and customer de-stocking.
• In mature economies, de-stocking at the customer level was the primary cause for the demand declines – where they occurred.

• Regional producers fought permanent closure – particularly in China.
• Some Chinese producers, due to substantial cash losses, temporarily idled capacity. Some closed permanently. But many more have thus far survived the downturn than TZMI initially expected.

• To manage cash effectively, many producers restricted capital spending from late 2014 through 2015.
TiO$_2$ profitability curve by technology: 2015

PTOI, US$/tonne

Cumulative production, ‘000 tonnes

© TZMI - NOT FOR REPRODUCTION
TiO$_2$ profitability curve by region: 2015

Cumulative production, ‘000 tonnes

2015 weighted average PTOI = US$178 per tonne
Operating rates

Operating rates, by producer type: 2010-2020

- Global
- Regional
- Chinese

© TZMI - NOT FOR REPRODUCTION
China capacity evolution

Note: The definition for ‘site’ as it pertains to this chart is a co-located operation with the same or similar products sold into the market. The number of sites in this report may differ slightly from TZMI’s ‘Tai Bai Fen’ report.
China exports: Q1 2011 – Q2 2016

North America

Central & South America

Other Asia-Pacific

Europe

Middle East & Africa

% change y/y (RHS)
Volume (LHS)
Capacity overhang: 2010-2020

Overhang as % of demand

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2016f</td>
<td>30</td>
<td>40</td>
<td>50</td>
<td>45</td>
<td>40</td>
<td>35</td>
<td>30</td>
<td>25</td>
<td>20</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>2017f</td>
<td>25</td>
<td>30</td>
<td>40</td>
<td>45</td>
<td>40</td>
<td>35</td>
<td>30</td>
<td>25</td>
<td>20</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>2018f</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>40</td>
<td>45</td>
<td>50</td>
<td>40</td>
<td>35</td>
<td>30</td>
<td>25</td>
<td>20</td>
</tr>
<tr>
<td>2019f</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>40</td>
<td>45</td>
<td>50</td>
<td>40</td>
<td>35</td>
<td>30</td>
<td>25</td>
</tr>
<tr>
<td>2020f</td>
<td>10</td>
<td>15</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>40</td>
<td>45</td>
<td>50</td>
<td>40</td>
<td>35</td>
<td>30</td>
</tr>
</tbody>
</table>

Note: capacity overhang = global capacity minus global demand
TiO$_2$ pricing fundamentals

Global weighted price average: 1988-2015

US$ per tonne

© TZMI - NOT FOR REPRODUCTION
NEAR-TERM OUTLOOK
## Trends

### China remains a supply and demand risk to the global market

### Tight supply/demand fundamentals to persist through 2016

### Economic concerns outweighed by cyclical strength

## Commentary and observations

- Many postulate that China’s domestic demand is weak.
- 11 consecutive price increases – the pressure on some suppliers has lessened, breathing new life into a significant portion of the supply base.
- The obvious risk here is slowing or even flat demand with increasing output, leading to more exports.

- Excepting an unforeseen recession or other supply/demand disruption, TZMI believes the current cycle will continue through the end of 2016.
- Emerging Asia appears to be the most vulnerable region near term. This region appears to have the level of demand that has exceeded underlying demand the greatest thus far in 2016 and thus the most likely to experience a stronger downturn when the cycle inflects.

- The key to managing the cycle near term for producers is to maintain inventory discipline through early 2017 when demand is at its seasonal low point.
- The cycle could persist through 2017 if producers maintain discipline and avoid market share battles. Critical in this fight are the actions of China’s supply base, which is improving quality and global competitiveness.
Some key observations

• Some production decreases are creating a difficult situation in areas where supplies are tight.
  – Below normal inventory levels for most producers, the impact is much more dramatic than it would be under normal circumstances.
  – Can often lead to an increase in apparent demand to producers as customers scramble for supplies, occasionally ‘buying forward’ of needs.
  – The risk of overshooting the market during Q4 2016 remains a possibility.

• The Chinese continue to export a surging volume.
  – The current estimates of 550,000 tonnes of net exports - could be exceeded if demand weakens in the country and/or the Chinese continue to produce.
  – Some of the early exports were supplied from inventories which are now diminished.

• Henan Billions continues to push chloride products into the market
  – Reports of acceptable quality are circling the industry.
  – While the full transition to consistent, stable production and quality will continue to take time, Billions’ chloride plant continues to hold up to expectations of the firm leading the way in the ‘chloride race’ in China.
Some key observations

• TZMI now believes the cycle peak for supply/demand balance will be in mid/late 2017
  – Followed by some de-stocking in the seasonally slow period of the year and will continue through 2018.

• Latin America is showing some signs of a return to growth after extensive demand disruption in parts of the region in the past 12 to 18 months.
  – The region is still gripped by recession, structural reforms and lower government spending levels compared to the past five years.

• European demand has been a positive surprise vis-à-vis expectations earlier in the year
  – near-term outlook based on Brexit and consumer confidence?
  – Demand in Q3 driven more by supply concerns and tight overall global supply/demand balance than by Brexit concerns.
  – Inventory levels remain tight as a result of some minor production outages in the region.
TZMI Multi-client studies and periodicals

Mineral Sands Report | Mineral Sands Industry Data Report
TiO₂ Market Insight | TiO₂ Pigment Industry Report
PDF reports - published monthly

Titanium Feedstock Price Forecast | TiO₂ Pigment Price Forecast
PDF report - published quarterly

Titanium Feedstock Producers Comparative Cost Study
PDF reports - published annually

TiO₂ Pigment Producers Comparative Cost & Profitability Study

China Taibaifen (China titanium)
PDF report - published quarterly

Titanium Feedstock Supply/Demand | Zircon Supply/Demand
PDF report - published quarterly
End