B+L GlobalBuildingMonitor:

Data driven insight into the future of global construction

Dr. Marcus Schütz

Hong Kong
9th of November, 2016
# Agenda

1. B+L Forecasting Methodology and Data

2. Global Outlook of Construction Industry 2020
   - a) Residential
   - b) Non Residential

3. Global Building Monitor (GBM)

4. Q & A
The B+L Underlying Demand Model (example Residential Buildings)

Supply
- Current or future over demand
- Access to financing
- Investor confidence
- ... and also Investor Overconfidence
- Regulatory environment
- Government intervention

Demand
- Population growth
- Immigration
- Urbanization
- Decreasing household size
- Replacement
- Secondary homes

under-supply

oversupply

under-demand

over-demand (shortage)
Building Permits Top 20 countries (residential building)

Underlying demand India 2016:
6.829.359 units

Source: B+L, 10/2016; 2016/2020=forecast
The B+L Underlying Demand Model (example Office Buildings)

**Supply**
- Current or future over demand
- Access to financing
- Investor confidence
- ... and also Investor Overconfidence

**Demand**
- Number of employees service sector
- Office space per employee
- GDP-share of service sector

Diagram:
- Under-supply
- Under-demand
- Oversupply
- Over-demand (shortage)
Example: Underlying demand office for Sweden

Source: B+L, 10/2016; f=forecast
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Construction activity by region (residential building, non-residential building, civil engineering)

- Asia: CAGR +3.16%
- West Europe: CAGR +3.64%
- NAFTA: CAGR -1.37%
- East Europe: CAGR +1.41%
- LATAM: CAGR +1.34%
- MEA: CAGR +1.52%
- 2008: 2,173.2 billion EUR
- 2016: 3,277.3 billion EUR
- 2020: 2,893.4 billion EUR

Source: B+L, 10/2016; 2016/2020=forecast
China is driving the Asian Construction Activity (residential building, non-residential building, civil engineering)

Source: B+L, 10/2016; 2016/2020=forecast
Construction output by region (residential building)

Source: B+L, 10/2016; 2016/2020=forecast
Construction output by region (non-residential building)

CAGR +2.89%  
CAGR +3.94%  
CAGR +0.65%  
CAGR +1.4%  
CAGR -1.25%  
CAGR +1.5%

source: B+L, 10/2016; 2016/2020=forecast
Construction output by region (civil engineering)

CAGR +3,29%

CAGR +2,97%

CAGR -2,22%

CAGR +1,22%

CAGR +1,64%

CAGR +1,3%

source: B+L, 10/2016; 2016/2020=forecast
Building Permits by region (residential building)

CAGR +2.94%
27,525

CAGR +4.97%
24,512

CAGR +3.85%
16,620

CAGR +2.73%
2,045

CAGR +1.74%
1,655

CAGR +0.88%
1,764

CAGR -2.34%
1,236

CAGR +0.66%
1,387

source: B+L, 10/2016; 2016/2020=forecast
Building Permits by region (non residential building)

CAGR +5,95%

CAGR +2,86%

CAGR -1,57%

CAGR +0,63%

CAGR -4,46%

CAGR +2,25%

Asia 1 364.0

NAFTA 354.0 319.9

West Europe 226.2 171.6

East Europe 110.3 133.4

LATAM 63.3 63.3 60.4

MEA 33.5 38.5 37.3

source: B+L, 10/2016; 2016/2020=forecast
Building Permissions Top 20 (non-residential building)

CAGR +3.02%

CAGR +6.77%

CAGR -1.66%

CAGR +0.43%

source: B+L, 10/2016; 2016/2020=forecast
Building Permits South Korea (residential building)

source: B+L, 10/2016

54,374 units permitted in August 2016
Building permits South Korea (non-residential building)

8,8 Mio. m² permitted in August 2016
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construction data for more than 60 countries monthly updated

www.globalbuildingmonitor.com

source: B+L, 10/2016
Example Screenshot: Construction activity by region (residential building, non-residential building, civil engineering)

source: B+L, 10/2016; 2016/2020=forecast
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Global Market Research for Construction, Housing and Real Estate

**Market Research**

- **Product Forecasts**
  Over 200 annual market studies show up-to-date market sizes, sales revenues and market development projections for all products in the building industry in more than 60 countries.

- **Customised Market Research**
  Finding the answer to specific customer-related questions with target market, customer and product analysis allowing market assessment and the understanding of critical success factors.

- **Data Portal / Global Building Monitor**
  Global building projections and building industry data Portals. Export figures and further 200 indicators on annual, quarter and monthly level for more than 60 countries. Data quantity and qualification are customised to individual requirements.

- **RegioDaten**
  Analysis of regional product potentials on ZIP-Code level for identification of high revenue market segments and local potential.

**Marketing Research**

- **Interviews (B2B und B2C)**
  B+L conducts customised interviews internationally in private (B2C) and business (B2B) target groups of the building industry. All interviews are conducted internally from the B+L headquarters in Bonn.
  B+L only cooperates with experienced interviewers. The immediate interaction between project leaders and interviewers ensure comparable and reliable results particularly with regard to international projects.

- **B+L target group analysis**
  Target group analysis helps you to understand your customers better and to predict trends. They thus represent the foundation of an effective and efficient marketing and communication strategy.

- **B+L Brand Monitor**
  The B+L Brand Monitor shows the profile of your product in the target customer group and the characteristics associated with your brand and your products. This lets you find the highest improvement potentials for your marketing and communication strategy.

**Conferences**

- **B+L Zukunftsforum**
  During this conference we present our projections for the European and worldwide Construction Industry. It is our aim to convey a detailed understanding of the trends and developments in all important global markets.

- **B+L Sanierungskonferenz**
  Every year B+L conducts a great number of studies in the refurbishment markets. These results are presented during this conference.

- **Individual presentations**
  B+L is available to take part in strategic company meetings, congresses, association meetings or specific customer events.
Here you will find a list of the main product groups for which we have researched on commissioned projects:

<table>
<thead>
<tr>
<th>Insulation materials</th>
<th>Engineered wood</th>
<th>Windows / Glass</th>
<th>Others</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Expanded Polystyrene (EPS)</td>
<td>- MDF/HDF</td>
<td>- Window types by different frame</td>
<td>- Gypsum Boards</td>
</tr>
<tr>
<td>- Extruded Polystyrene (XPS)</td>
<td>- OSB</td>
<td>materials (PVC, Wood, Wood-Alu,</td>
<td>- Radiant Cooling Ceilings</td>
</tr>
<tr>
<td>- Polyurethane Insulation (PU/PI)</td>
<td>- Laminates</td>
<td>Metal, …)</td>
<td>- Noise insulating wall</td>
</tr>
<tr>
<td>- Glass wool</td>
<td>- Raw chip boards / melamine</td>
<td>- Insulated Glass</td>
<td>- Cement</td>
</tr>
<tr>
<td>- Stone wool</td>
<td></td>
<td>- Laminated Glass</td>
<td></td>
</tr>
<tr>
<td>- Wood fibre panels</td>
<td>- faced chipboards</td>
<td>- Safety glass</td>
<td></td>
</tr>
<tr>
<td>- Cellulose</td>
<td></td>
<td>- Glass partition wall</td>
<td></td>
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<tr>
<td>- Blown in insulation</td>
<td></td>
<td>- Glass for interior fittings</td>
<td></td>
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<tr>
<td>- Spray foam</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Roofing</th>
<th>Wood products</th>
<th>External walls / facade</th>
<th>In addition</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Flat roof</td>
<td>- Soft wood</td>
<td>- Plastered facade</td>
<td>- We write regular reports for the</td>
</tr>
<tr>
<td>- Pitched roof</td>
<td>- Planed wood</td>
<td>- Ventilated Facade (cement</td>
<td>wood industry.</td>
</tr>
<tr>
<td>- Roofing material</td>
<td>- Profiled wood</td>
<td>boards, zinc, alu, HPL)</td>
<td>- We conduct interviews for</td>
</tr>
<tr>
<td>- Clay tiles, concrete tiles etc.</td>
<td>- Glued laminated timber</td>
<td>- Calcium Silicate Blocks</td>
<td>customer magazines (e.g.</td>
</tr>
<tr>
<td>- Bitumen, Waterproofing</td>
<td>- Structural timber</td>
<td>- Aerated Concrete Blocks</td>
<td>Heimtex).</td>
</tr>
<tr>
<td>- Synthetics etc.</td>
<td>- Wood products in garden</td>
<td>- Clay Bricks</td>
<td>- We regionalise product groups</td>
</tr>
<tr>
<td>- Metal, Alu, Zinc etc.</td>
<td>- Terrace decking</td>
<td>- ETICS / EIFS</td>
<td>on ZIP code level.</td>
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<tr>
<td>- Vapour barrier</td>
<td>- Carports</td>
<td></td>
<td>- We analyse business locations</td>
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<tr>
<td>- Breather Membrane</td>
<td></td>
<td></td>
<td>for e.g. building material traders.</td>
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<tr>
<td>- Aeration and Ventilation</td>
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<td>- We provide indicators of global</td>
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<td>- Rooflights</td>
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<td>construction activity including</td>
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<td>- Skylights domes</td>
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<td>further relevant indicators in our</td>
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<td>online Data Portal.</td>
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<td></td>
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<td>- We regularly publish multi-client-</td>
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<td></td>
<td></td>
<td></td>
<td>studies on various construction</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>related topics.</td>
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<table>
<thead>
<tr>
<th>Doors</th>
<th>Flooring</th>
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<tbody>
<tr>
<td>- Exterior doors</td>
<td>- Laminate flooring</td>
<td></td>
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<tr>
<td>- Fire safety doors</td>
<td>- Luxury Vinyl Tiles (LVT)</td>
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<tr>
<td>- Interior Doors</td>
<td>- Linoleum</td>
<td></td>
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<tr>
<td>- HPL, Foil, white painted etc.</td>
<td>- Ceramics</td>
<td></td>
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<tr>
<td>- Metal frame doors</td>
<td>- Wood Flooring</td>
<td></td>
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<tr>
<td>- Steel doors</td>
<td>- Textile Flooring</td>
<td></td>
<td></td>
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<tr>
<td>- Garages</td>
<td>- Vinyl</td>
<td></td>
<td></td>
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<tr>
<td>- Gates</td>
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</table>

In addition:
- We write regular reports for the wood industry.
- We conduct interviews for customer magazines (e.g. Heimtex).
- We regionalise product groups on ZIP code level.
- We analyse business locations for e.g. building material traders.
- We provide indicators of global construction activity including further relevant indicators in our online Data Portal.
- We regularly publish multi-client-studies on various construction related topics.
Data for 73 countries are available. These countries make up more than 90% of the global construction volume.

**Construction data in the online portal**

The market data and indicators will be presented in your personalized online portal. Here, you will be able to access the latest data and quickly receive updates and real-time developments in the various markets. Graphs, tables, and maps can easily be used to display the data. In addition, with the comparison tool, data from different countries can be compared with one another.

**Your benefits:**

- Systematic and continuous market information avoids surprises and provides security.
- Easy data input into your company’s systems and multiuser access allow for efficient use of the data inside your company.
- A worldwide overview enables early detection of turning points in the main markets and makes developments in new markets transparent.

**How does B+L work**

- B+L Marktdaten is constantly in contact with all national statistics offices. In addition, we query and verify the data quarterly.
- B+L Marktdaten undertakes primary research by conducting interviews with construction companies, builders' merchants, architects, associations and experts on a regular basis.
- B+L Marktdaten’s forecasts are based on a variety of forecasting models which are calibrated appropriately to the data. In addition to conventional trend analyses, structured expert interviews are carried out using the Delphi method.

**How does B+L deliver?**

- Online-Access via the data portal, data visualization through dashboards
- Simple exporting of data into Excel for further data processing within your EDP environment
- Automatic PDF-reports

**www.globalbuildingmonitor.com**

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The extensive B+L data pool forms the basis of the investigations and studies. Market and economic data from over 60 countries are continually updated and easily retrievable.

The institute publishes more than 200 market research studies annually for all the relevant international markets.

What does B+L deliver?
- Sales/market volume for the specific product
- 3-year forecast
- Analysis of the distribution channels
- Information on construction performance / key data
- In-depth comments on specific developments
- Comparable market information for 60 countries

Your benefits
- Uniform data collection and presentation from 73 countries and comparability of results
- Data collected specifically for your market and issues
- Up-to-date data
- Specialized B+L contact to clarify any questions
- Significant industry knowledge and good product understanding from B+L’s 15 years of experience

Sources
- B+L Data Portal (construction database), B+L Marktdaten GmbH data pool (product database)
- B+L primary surveys with architects, trade, processors and manufacturers
- B+L primary surveys with industry experts and industrial and association representatives
- Expert discussions on the practical validation of the test results

Secondary sources:
- Statistics from national statistics offices
- Eurostat and other international organizations (EU-Commission, OECD, etc.)
- Association data (when available)
- Press reports
- Annual company reports
- Official legislative publications and funding programs
- External studies and publications (e.g. GFK consumer confidence index)

Methods

Determination of demand for new construction:
- B+L Data Portal (GBM): number of new dwellings and buildings by building type for the residential and non-residential sectors with forecasts through 2017.
- Determination of secondary factors by continuous surveying of architects and processors
- Both factors result in the calculated total market size, for example, windows in new construction (units and m²).

Determination of demand for renovation:
- Determination of renovation rates per year based on continuous surveying of processors.
- In addition to determining the product specific renovation rates for the current or previous year, trends and performance forecasts are queried.

www.BL2020.com/MarketResearch

your contacts:
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Assessment of relevant factors such as legislation, stimulus packages, support programs and willingness to invest as well as their impact on renovation performance. Double-check: total market minus new construction = renovation

Verification of the total market
- Production and foreign trade statistics
- Association data (when available)
- External studies, publications
- B+L Data Pool
- Cross-check supplier sales
- Verification of the data with industry experts (producers, traders, processors).

Forecasts
New construction
- B+L market data is in permanent contact with all national statistics offices. Official statistics are queried and verified quarterly worldwide.
- B+L Marktdaten carries out additional surveys with construction companies, builders’ merchants, architects, associations and experts.
- For the forecasts B+L Marktdaten uses multivariate predictive models, which are calibrated depending on the requirements of the data series. In addition to conventional trend analyses, structured expert interviews are carried out using the Delphi method.

Renovation
- The forecasts result from the assessment of the construction and renovation economy (determined by regular target group surveys) as well as the development of relevant conditions (funding programs, stimulus programs, legislation, willingness to invest). In long-term developments (to 2020) the country-specific long-term construction cycles as well as the relevant climate protection aims are taken into account.
- B+L’s forecasts are verified per country in interviews with industry experts.

B+L data quality / Interviewer quality
B+L’s experience is based on more than 1000 international projects and studies. Since 2005 B+L has regularly examined all products related to construction, housing and real estate in all the relevant international markets. By combining extensive and detailed knowledge of the market with approved methodology in research and analysis, quick and accurate results are ensured. At our headquarters in Bonn native speaker telephone interviewers work together with experienced industry analysts.

Data quality is ensured through:
- Specialized industry analysts with more than 15 years of experience in project management trained and experienced, native speaker interviewers with long-standing connections to B+L central research center in Bonn: All studies (desk research and phone interviews) are conducted at the head office in Bonn (no outsourcing, no subcontractors).
- All survey results are double-checked.

Delivery format
- The data are presented in report form or supplied as pivot tables in Excel format.
- In addition to supplying the data via e-mail, the data can be provided upon request in a customer portal.

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