

Explanation of the Process ISPA Uses to Forecast Future Market Activity in the Mattress Industry

Since the mid-1980s, the International Sleep Products Association has published forecasts for the value and volume of U.S. mattress sales. ISPA publishes its primary forecast in September of each year, followed by an update in April. The forecasts cover anticipated market activity in the mattress market for the balance of the current year and the next year.

The forecasts for the mattress industry reflect the consensus of the ISPA Forecast Panel, which is made up of leading mattress producers and suppliers. ISPA's econometric model is used to generate a baseline industry forecast, based on the current outlook for the national economy prepared by the University of Michigan. This initial forecast is then reviewed and analyzed by the Forecast Panel.

The resulting "consensus" forecast couples the econometric model's statistical relationships with insight and up-to-the-minute market movements observed by seasoned industry analysts. The members of the Forecast Panel adjust the econometric model baseline forecast to produce a forecast consistent with the average of the predictions.

Using well-established statistical regression techniques, the ISPA econometric model quantifies the economic relationship between the mattress industry and the U.S. economy and the home furnishings market.¹ In the model, the primary drivers of mattress industry shipments, in order of importance, are consumer purchasing power, housing turnover, and new home starts. Additional information is obtained from the relative price of mattresses, changes in overall furniture consumption, changes in consumer wealth and mattress imports. The econometric model is based on analyses of historical data (covering a period of 25-30 years in most cases).

The following is a brief explanation of the ISPA model:

The ISPA model forecasts the future volume and value of U.S. mattress shipments using the following four equations:

1. Unit Mattress Shipments
2. Average Unit Wholesale Price for Mattresses
3. Consumer Demand for Furniture (defined as personal consumption expenditures for furniture, measured in constant 2009 dollars)
4. Unit Mattress Imports (defined as import units of human-size mattresses and foundations as reported by the U.S. International Trade Commission)

¹ ISPA uses regression analysis to estimate a statistical model which is used to make forecasts. Regression analysis establishes the mathematical relationship between a dependent variable (such as mattress shipments) and independent explanatory variables (such as disposable income or housing starts) that are used to explain the variation in the dependent variable. The analysis identifies which independent variables are relevant and quantifies the impact each variable has on the dependent variable.

Regression analysis is used to determine which explanatory variables are most useful for understanding the pattern of mattress shipments over time. Based on that analysis, which is reviewed and updated on a regular basis, ISPA uses quarterly data from a variety of government and industry sources for the following independent variables (some of which may appear in more than one equation):

1. Unit Mattress Shipments

This equation forecasts unit shipments of mattresses. It is based on the following independent variables:

Primary variables (in order of importance):

- Change in and recent level of personal disposable income (adjusted for inflation)
- Sales of existing single-family homes
- Number of recent single-family home starts

Additional variables:

- Change in personal consumption expenditures for furniture (adjusted for inflation)
- Change in the average unit price for mattresses (adjusted for inflation)
- Change in consumer wealth (based on 6-month change in S&P Stock Market index, adjusted for inflation)
- Mattress imports as a share of domestic mattress shipments.

2. Average Unit Price for Mattresses

This equation forecasts the average unit price, which is then multiplied by unit shipments to estimate the value of future mattress sales. It is based on the following independent variables:

- Recent mattress prices
- Recent level of the consumer price index
- Recent change in the price index for crude oil

3. Consumer Demand for Furniture

This equation forecasts real personal consumption expenditures for household furniture. It is based on the following independent variables:

- Change in and recent level of real personal disposable income (adjusted for inflation)
- Change in and recent level of housing activity (weighted average of current and lagged housing (single and multi-family) starts plus current sales of existing single-family homes)
- Change in consumer wealth (based on S&P 500 Stock Market Index, adjusted for inflation)
- Change in real long- and short-term interest rates (based on AAA bonds and 3-month CDs, respectively, adjusted for inflation)

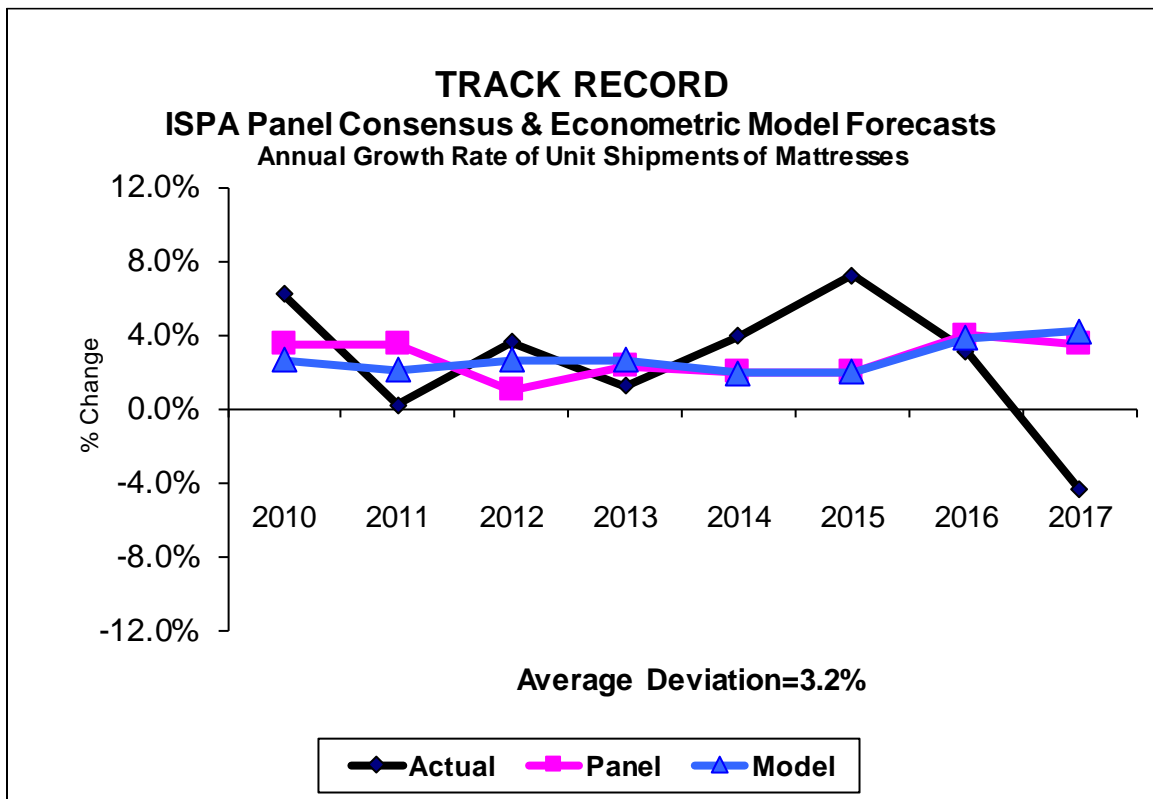
4. Units Mattress Imports

This equation forecasts unit imports of mattresses. It is based on the following independent variables:

- Recent level of mattress unit imports
- Average unit price of mattresses (adjusted for inflation)
- Change in and recent level of imports of nonpetroleum goods, measured in constant 2009 dollars

Forecast Accuracy

The graph below shows the actual growth in shipments, the predicted annual growth rate of unit shipments based on the ISPA econometric model, and the published forecast based on the consensus of the ISPA Forecast Panel.



The following are the sources for the data used in the above equations:

Variable	Source
Mattress shipments (includes foundations)	ISPA
Average unit price of mattresses	ISPA
Personal consumption expenditures for furniture	Bureau of Economic Analysis
Personal disposable income	Bureau of Economic Analysis
Sales of existing single-family homes	National Association of Realtors
Single-family housing starts	Census Bureau
S&P Stock Market Index	Standard & Poor's
Mattress imports	International Trade Commission
Interest rates	Federal Reserve
Consumer Price Index (overall)	Bureau of Labor Statistics
Producer Price Index for Crude Oil	Bureau of Labor Statistics