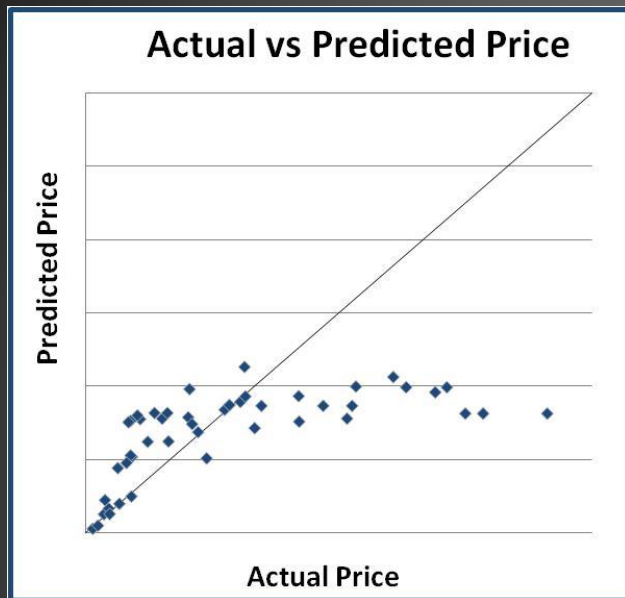
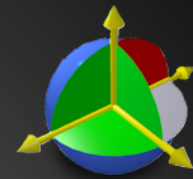


What are Value Response Surfaces? What are Value Estimating Relationships (VERs)?

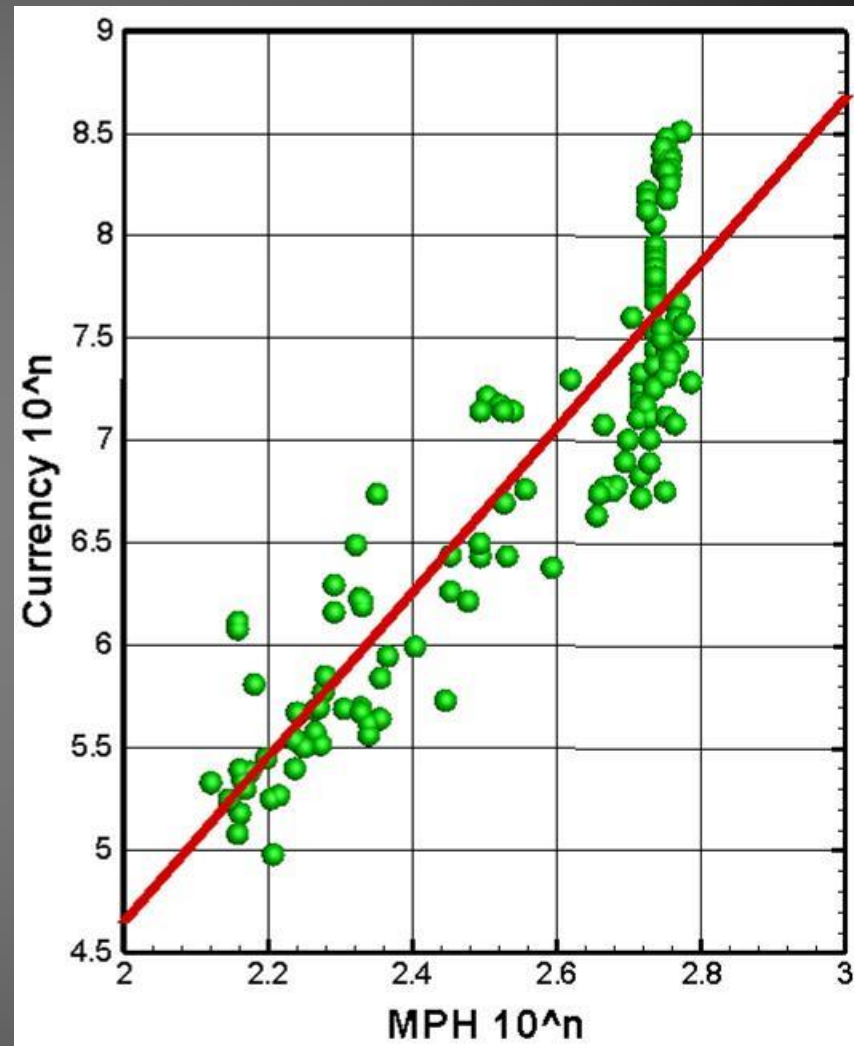
- Value Responses Surfaces reveal how markets react to changes in attributes
 - 3 dimensions: 2 horizontal for valued attributes, 1 vertical for \$
 - May be modulated by several (8 or more) variables (attributes)
- VERs are used to depict Value Response surfaces
 - Statistical analysis used to derive VERs
 - Markets' (buyers') votes for attributes that they like (willing to pay to get more) and dislike (willing to pay more to get less)

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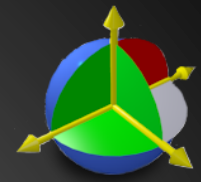
If we consider speed as valued attribute, we notice that as we add speed, the price (as for aircraft) rises (right). If speed were a perfect predictor of price (above), the predicted prices (again, as for aircraft) would exactly match the actual prices (all the dots would be on the 45° line). Other forces (features) are at work.



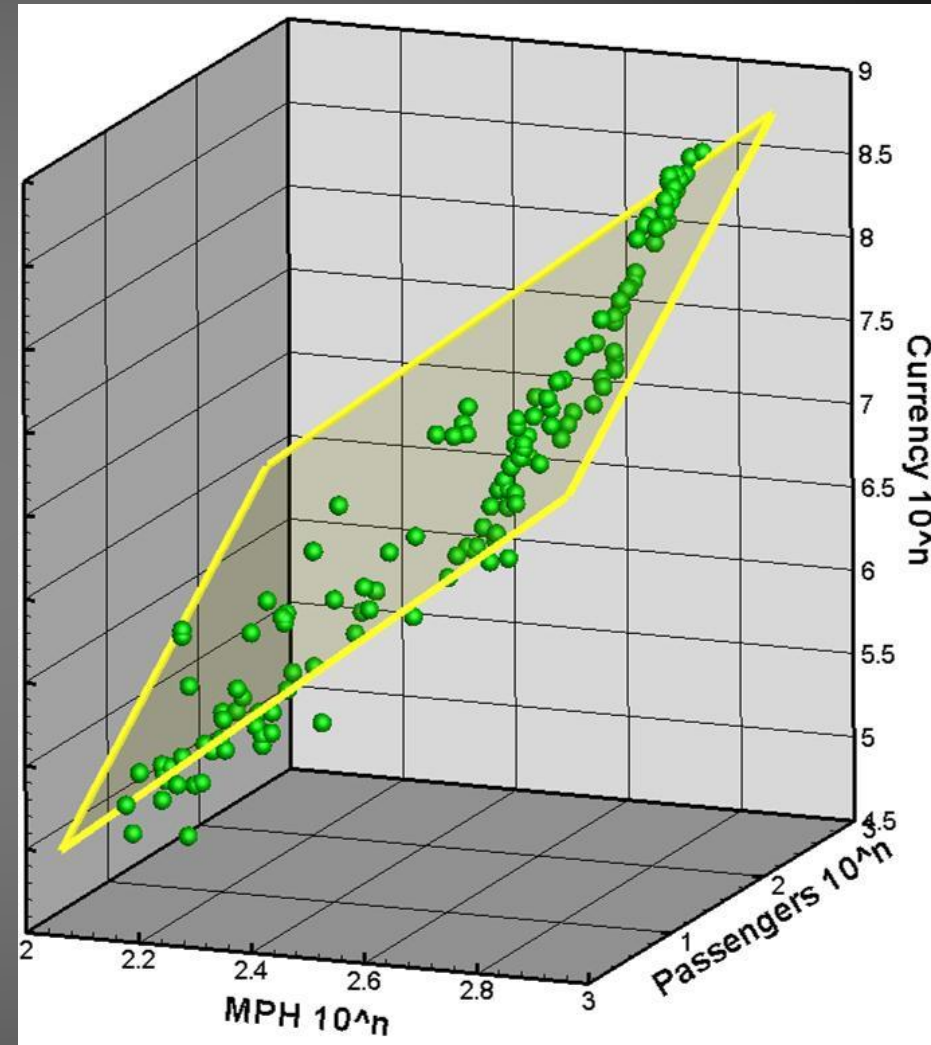
1 Variable (MPH)

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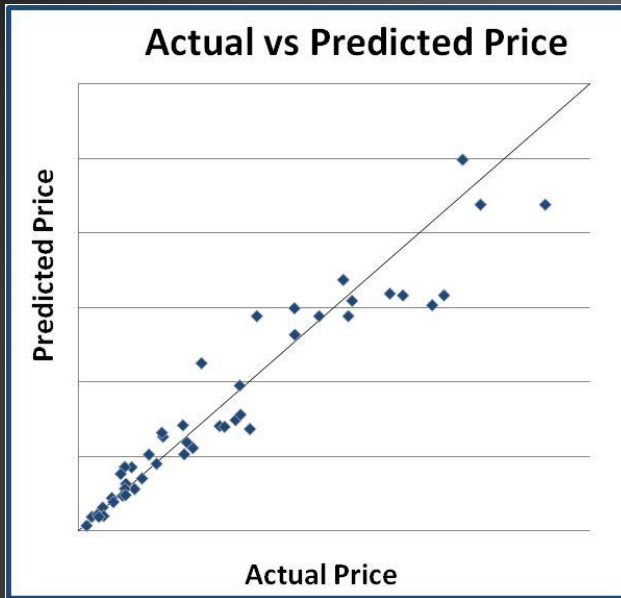
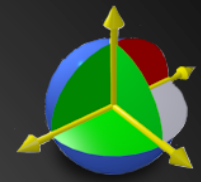
Adding passenger capacity as a valued attribute creates a Value Response Surface (right). The 2 variable equation (speed and passenger capacity) that predicts prices is closer to actual prices (above). Other valued features should be considered.



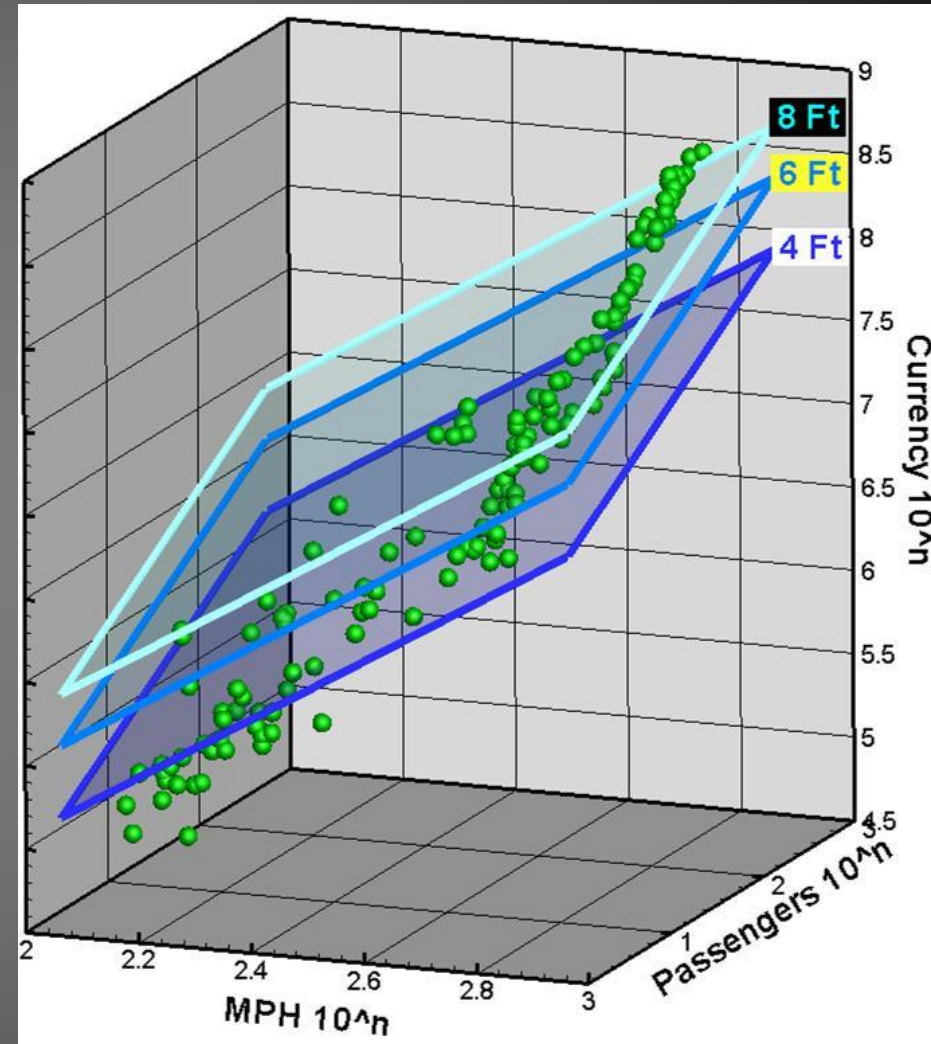
2 Variables (MPH & Passenger Capacity)

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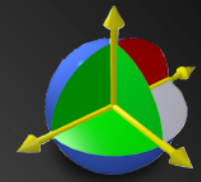
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Adding cabin height as a valued attribute permits multiple Value Response Surfaces (right). The 3 variable equation (speed, passenger capacity and cabin height) that predicts prices is closer still to actual prices (above).

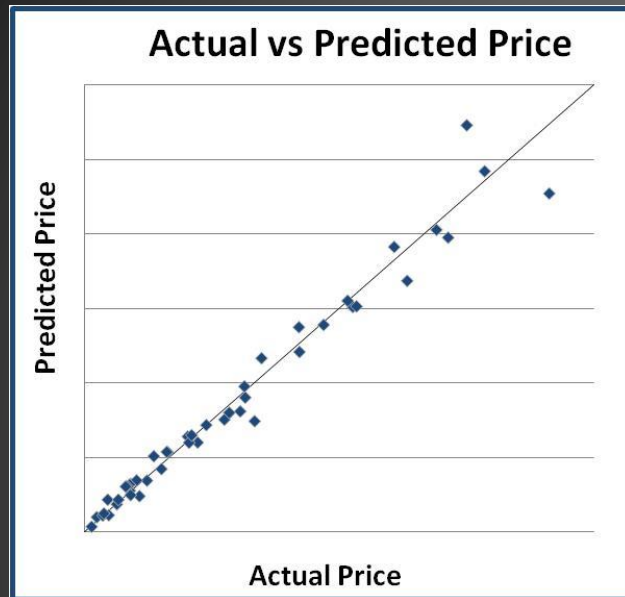


3 Variables (MPH, Passenger Capacity & Cabin Height)



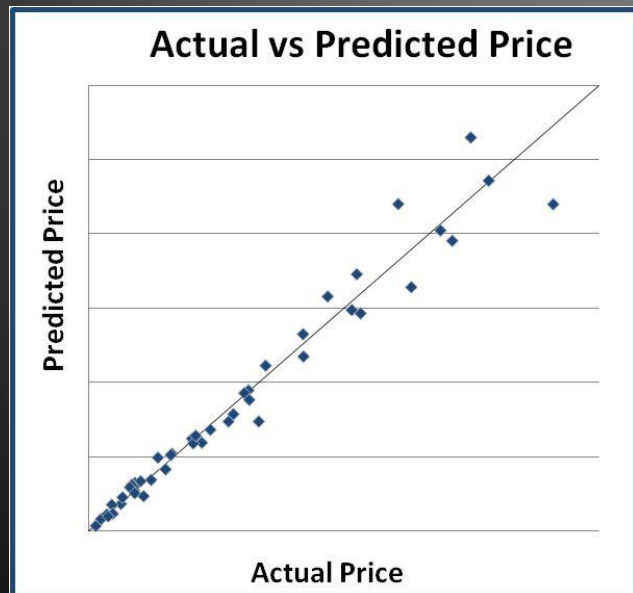
4 Variables (MPH, Passenger Capacity, Cabin Height and Range)

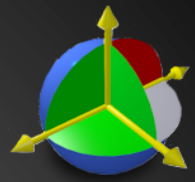
Range has value too, and it shows up as a statistically significant contributor to overall product value for aircraft (left). Adding range reduced the overall error as predictions approach actual prices.



5 Variables (MPH, Passenger Capacity, Cabin Height, Range & Number of Engines)

The number of engines is an important feature as well. Adding it into the mix (left) again provided error reduction. Note how much better this 5 variable equation predicts price than the ones that preceded it. Observe, too, that the prediction is not perfect.





Value Response Surfaces/ VERs Conclusions

Customers demonstrate that

- Statistically significant Value Estimating Relationships (VERs) based on their behaviors predict sustainable market prices
- Many product features (or attributes or variables) influence those buying behaviors
- Omitting study of important features may lead to incorrect pricing
- No Value Estimating Relationship perfectly predict outcomes