



Forecasting Broadband Demand in Australia

“The only function of economic forecasting
is to make astrology look respectable.”

John Kenneth Galbraith

Marat Fainstein

Research, Statistics and Technology

Communications Policy and Research Forum

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Accuracy of forecast

- Business
 - Market size
 - Investment decisions
- Government
 - Incentive schemes
 - Program costing



Broadband adoption in Australia

- Broadband subscribers
- Principal technologies
- Diffusion
- Structural change

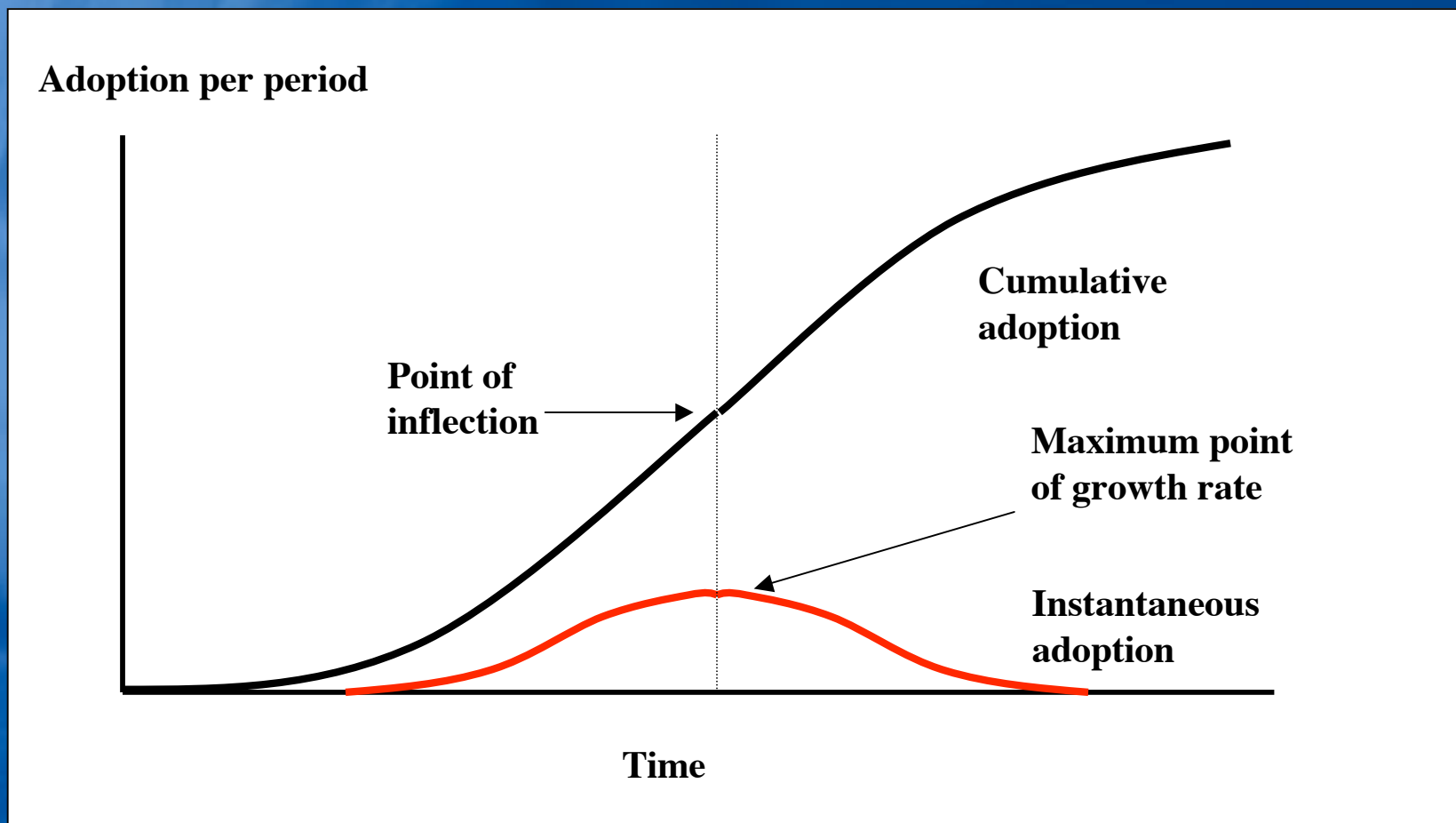


Three problems of diffusion modelling

- Lack of decision variables
- Decision variables included when the functional form of the variable is unknown
- Market size indifferent with respect to decision variables – not a realistic model



Diffusion process: Assumed pro innovation bias





Augmented Bass Model

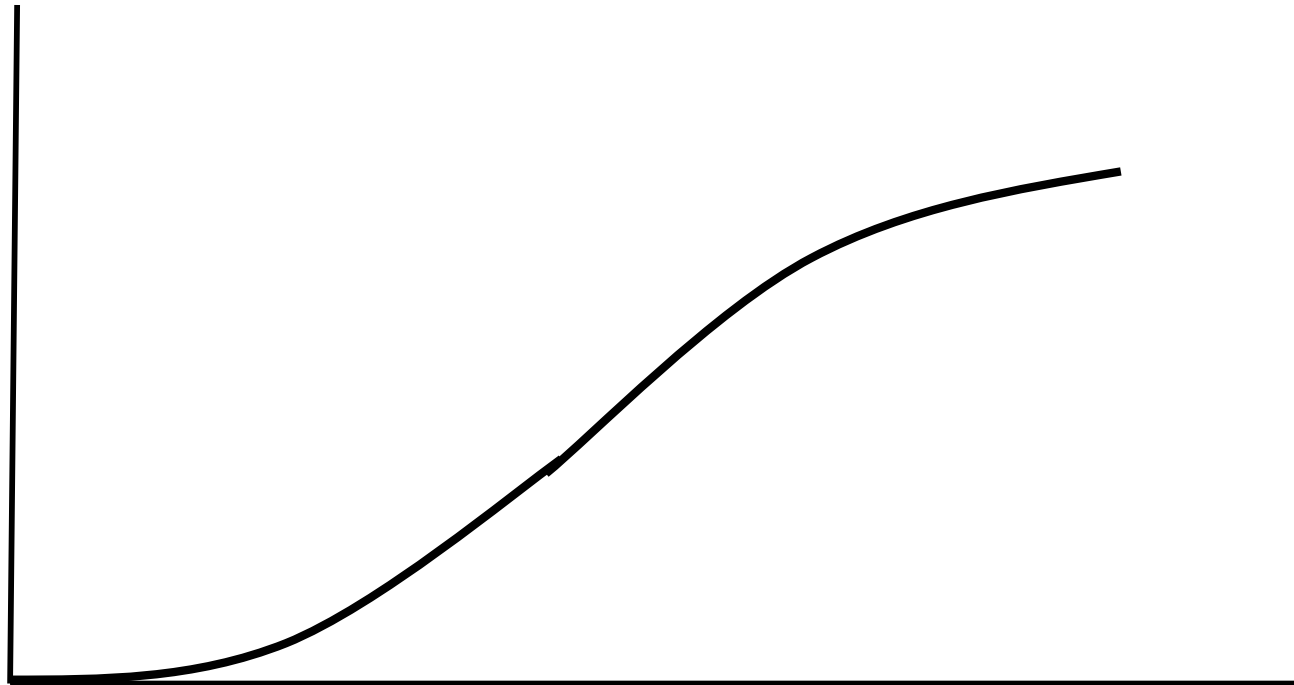
- Derivation
- Incorporation of decision variables
- Impact of decision variables on diffusion trajectory

Adoption forecast=Bass component + (non-linear component-difference in adoption)₆



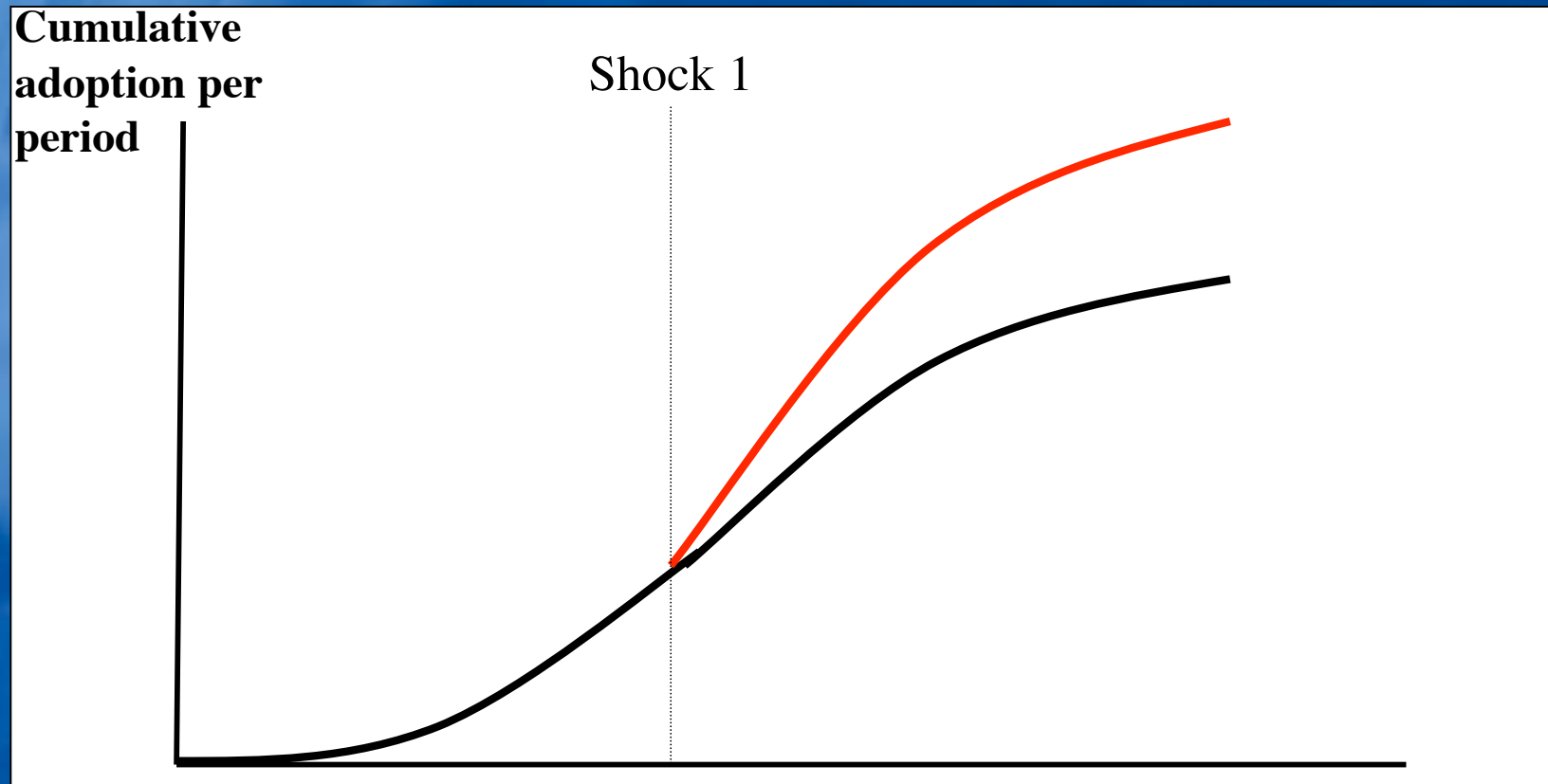
Change in decision variable: Preferable model

**Cumulative
adoption per
period**



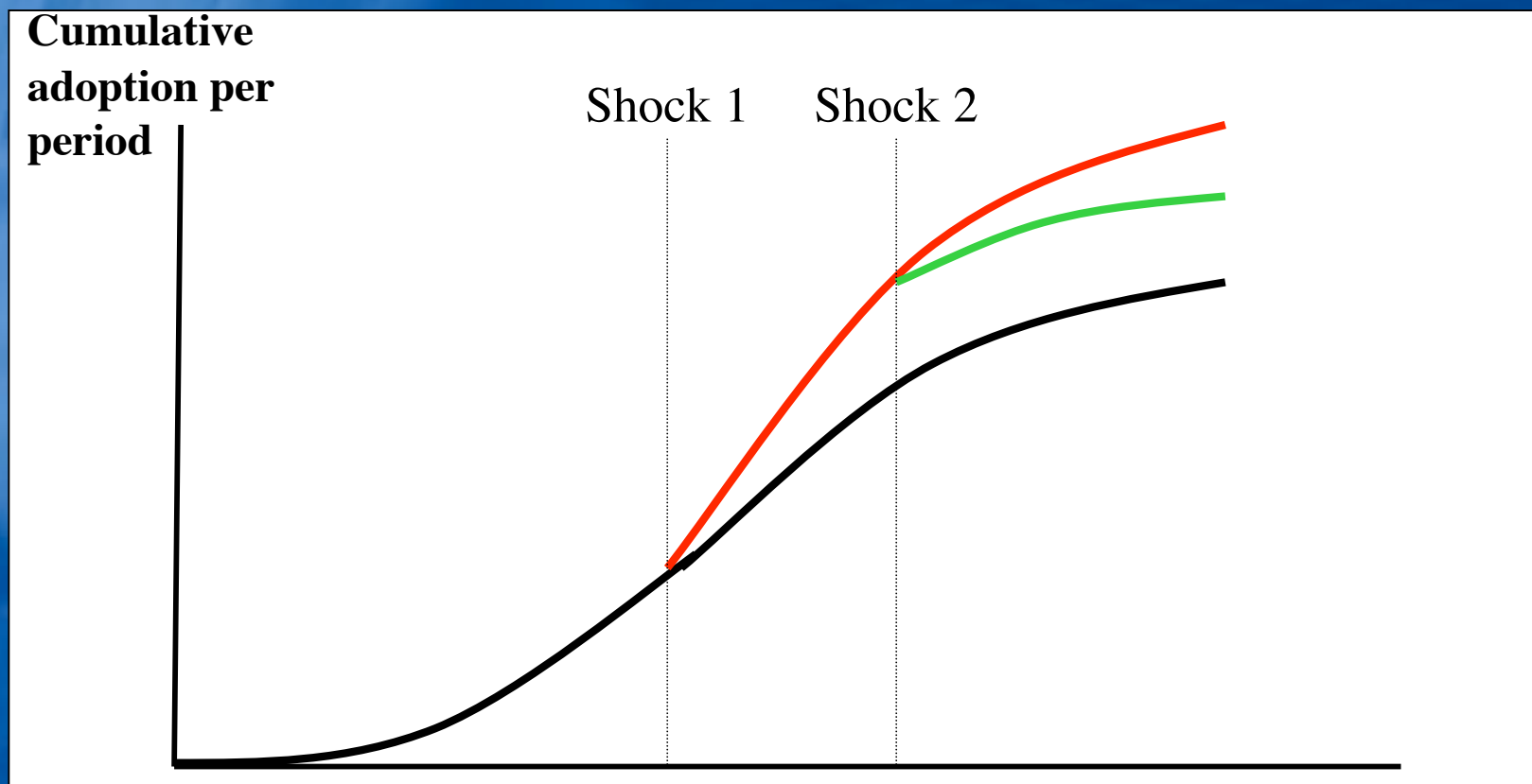


Change in decision variable: Preferable model





Change in decision variable: Preferable model





Other forecasting models

- Models *with* decision variables
 - Linear
 - Autoregressive distributed lag
- Models *without* decision variables
 - Bass
 - Simple logistic
 - Gompertz
 - Holt's exponential smoothing

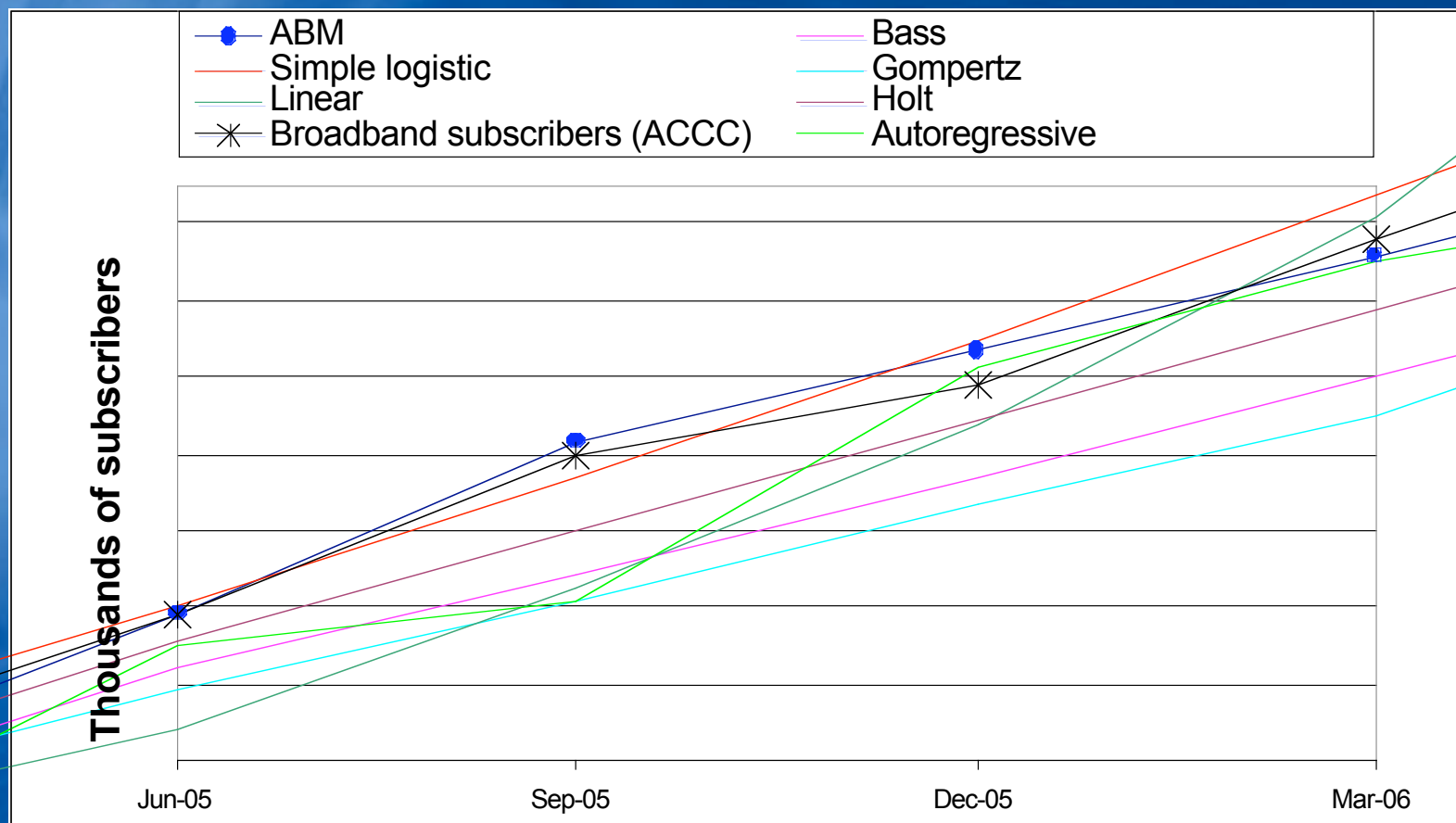


Forecasting accuracy comparison – four period out-of-sample forecast*

	Best case	Worst case
ABM	1.64%	5.13%
Simple logistic	2.63%	
Auto regressive	5.48%	
Linear	6.11%	57.55%
Bass	8.74%	
Holts exponential smoothing	10.02%	
Gompertz	11.18%	

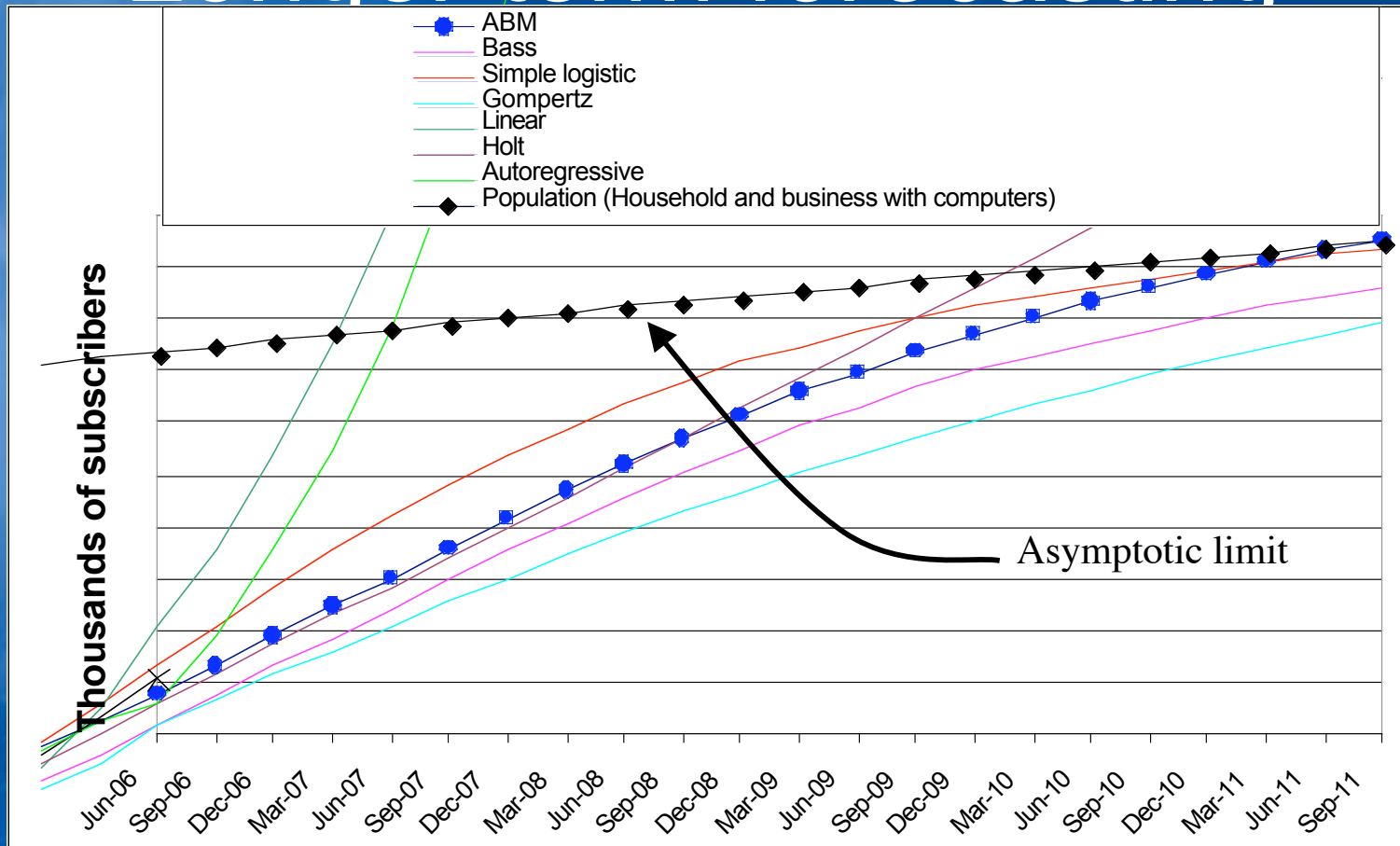


Short term forecast





Longer term forecasting





Conclusion

- Changing nature of diffusion requires a dynamic model
- The best models are the ones that combine the best aspects of diffusion and econometric models
- When making investment or funding decisions – models that best represent the changing nature of technology adoption are the ones more likely to provide the best forecasts