

Cellular-Only Substitution in the U.S. as Lifestyle Adoption: Implications for Survey Research

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Cellular substitution is a **stable process of lifestyle adoption**. Consequently,

- The *cell-phone-only* population will increase substantially.
- We can predict the size of key demographic groups in this *cell-only* population.
- Those predictions can be used to adjust wireline surveys when responses are not independent of sample frame, develop sampling plans, adjust subpopulation results and dual frame surveys.

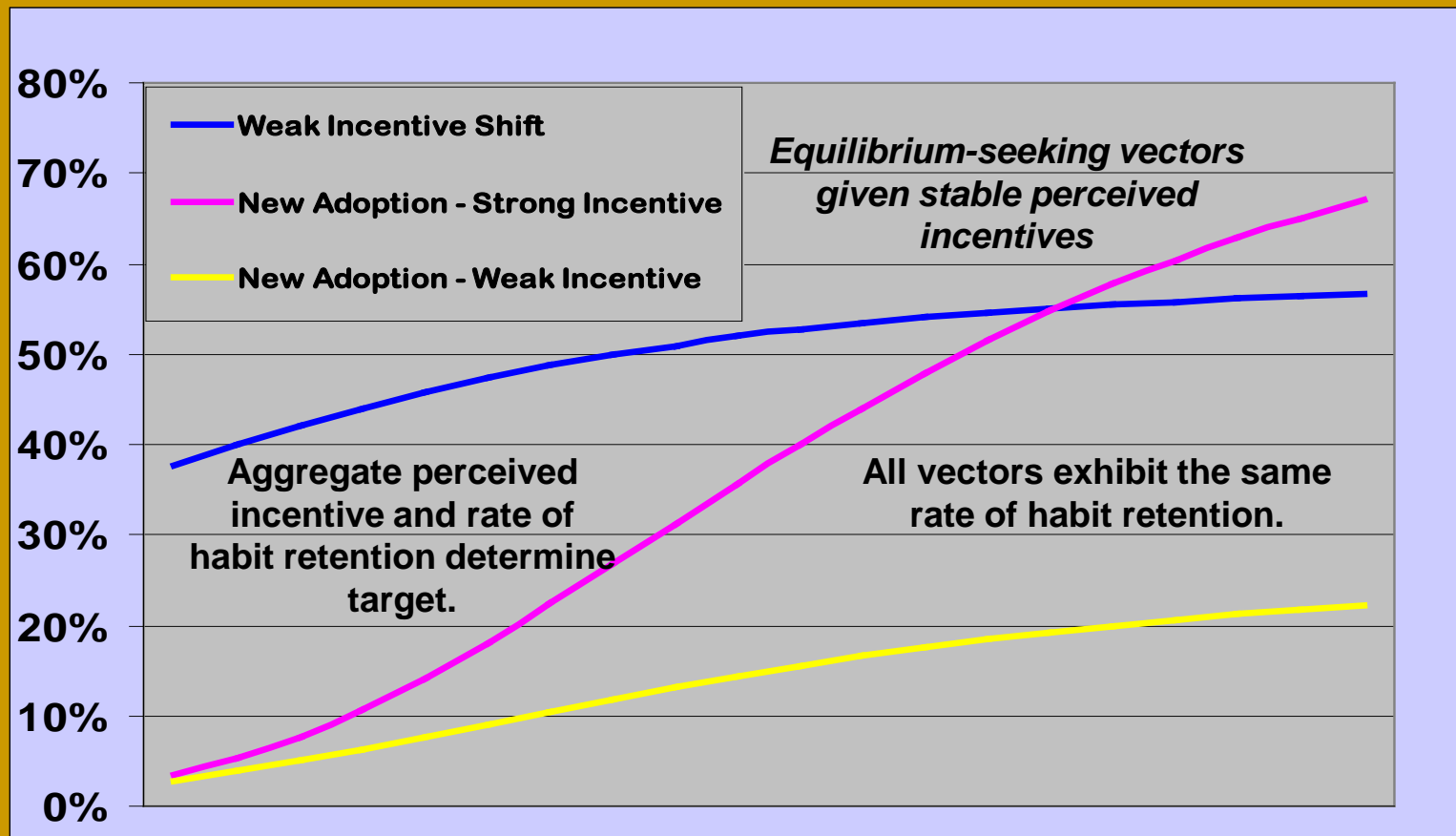
These conclusions flow from a model that describes and predicts a *vector of behavioral momentum* that is driven by

- The strength of current incentives (\mathbf{X}_{it})
- The strength of the tendency to respond to these incentives (\mathbf{B}_i)
- The strength of the tendency to persist in established behavior (λ or rate of habit retention)

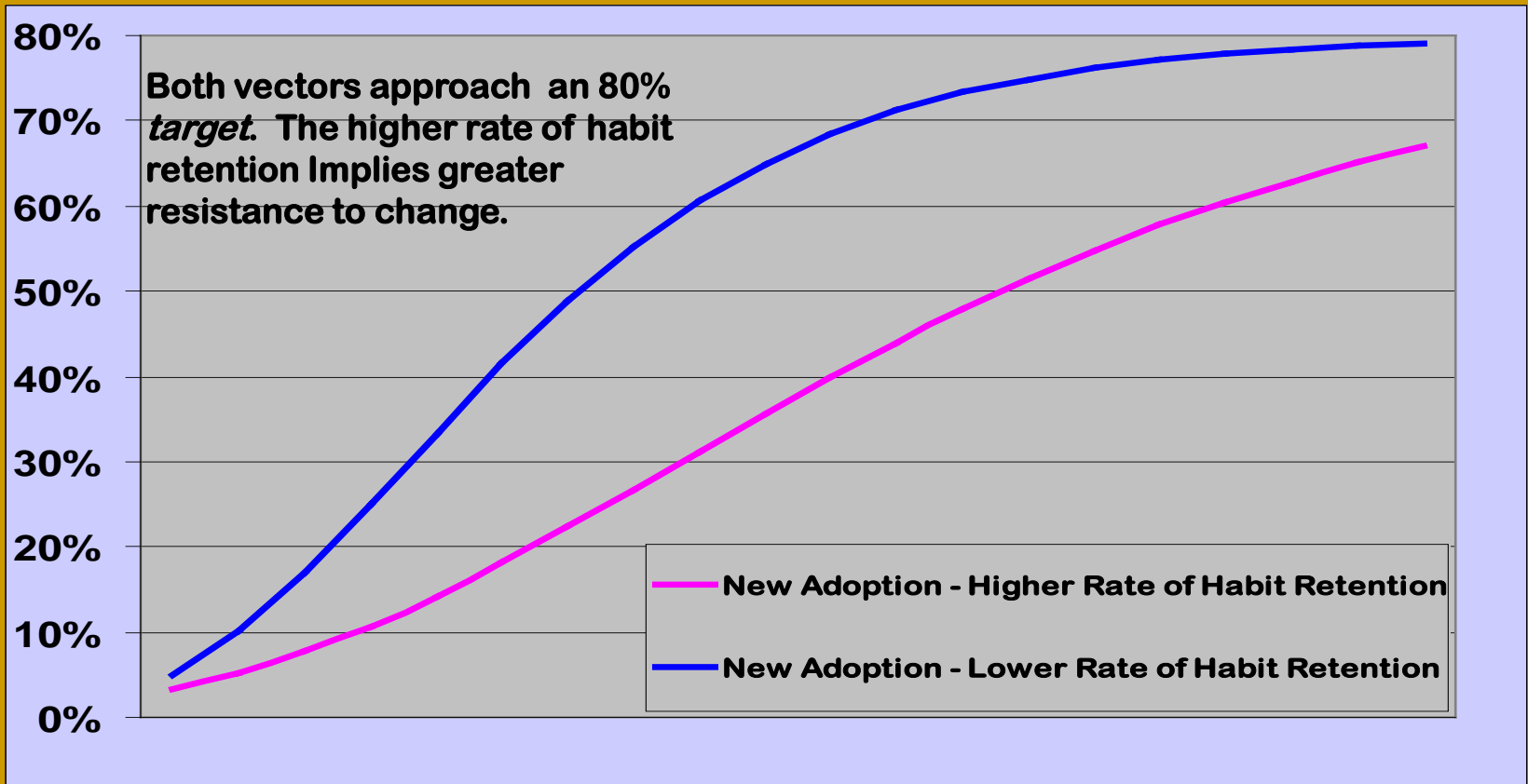
This concept is consistent with both economic and psychological theories of behavior

e.g. Nevin and Grace (2000), Koyck (1954) & Houthaaker and Taylor (1970)

The nature of the vector of behavioral momentum over time depends on the strength of the *perceived incentives to adopt* ($B_i \ln(X_{it})$).



The vector of behavioral momentum over time also depends on the strength of the *rate of habit retention* (λ).



Both *wireless* lifestyle adoption and *wireless-only* adoption reflect the same basic behavior, characterized by the same *rate of habit retention* (λ).

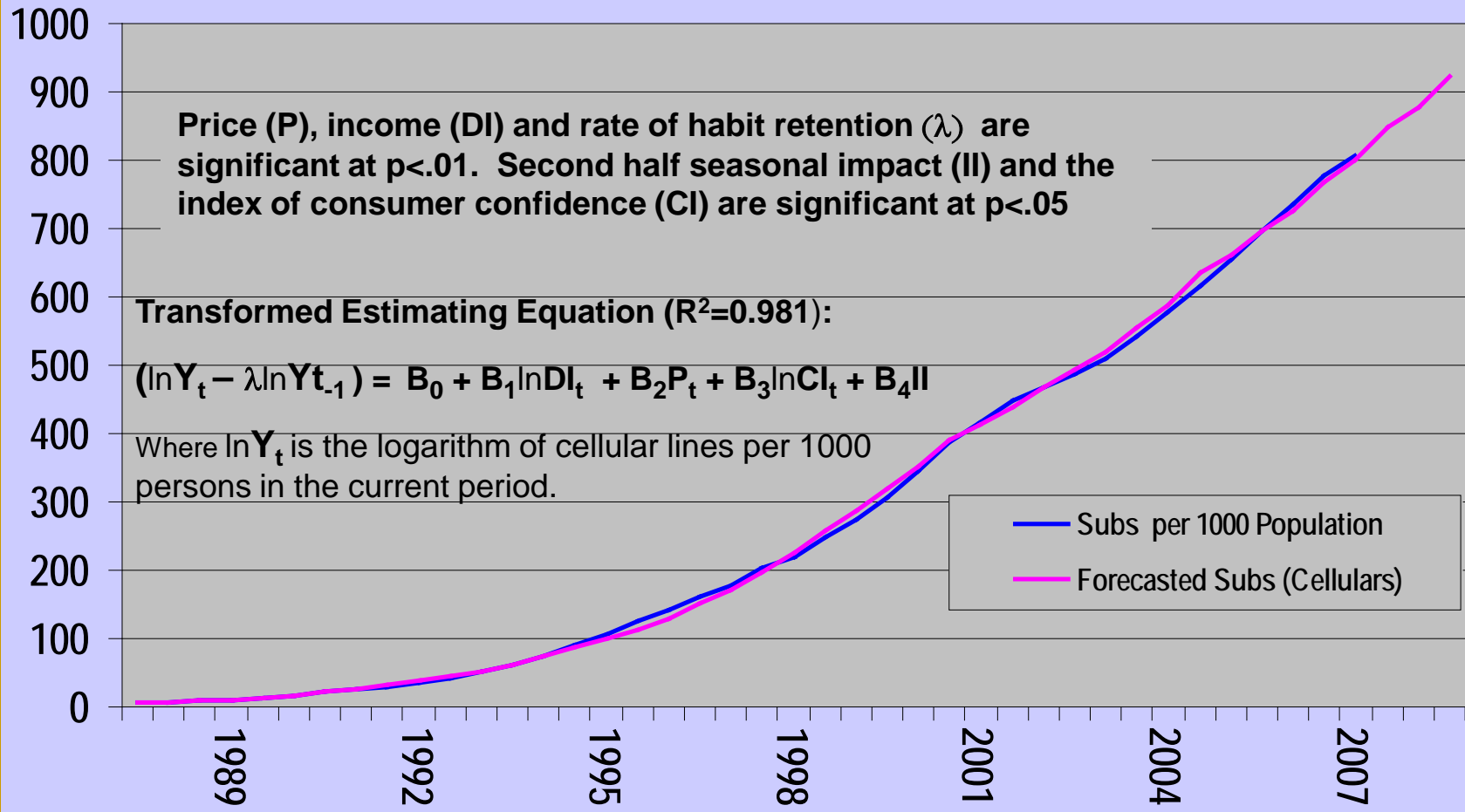
- This hypothesis could be tested based on the limited data available from the U.S. National Health Interview Survey (NHIS)
 - 8 semi-annual observations
- Three phases in test process
- All parameters estimated from independent samples (not NHIS) in Phase I and Phase II (*prior information*)
- *Perceived incentives* ($\ln(K) = \sum b_i \ln(X_i)$). by age cohort derived from NHIS data in Phase III

Phase I: Estimate λ for wireless adoption.

US Cellular Adoption 1987 - 2006

Graphed forecast uses *lagged estimates*.

Parameters estimated from semiannual data through June 2006.

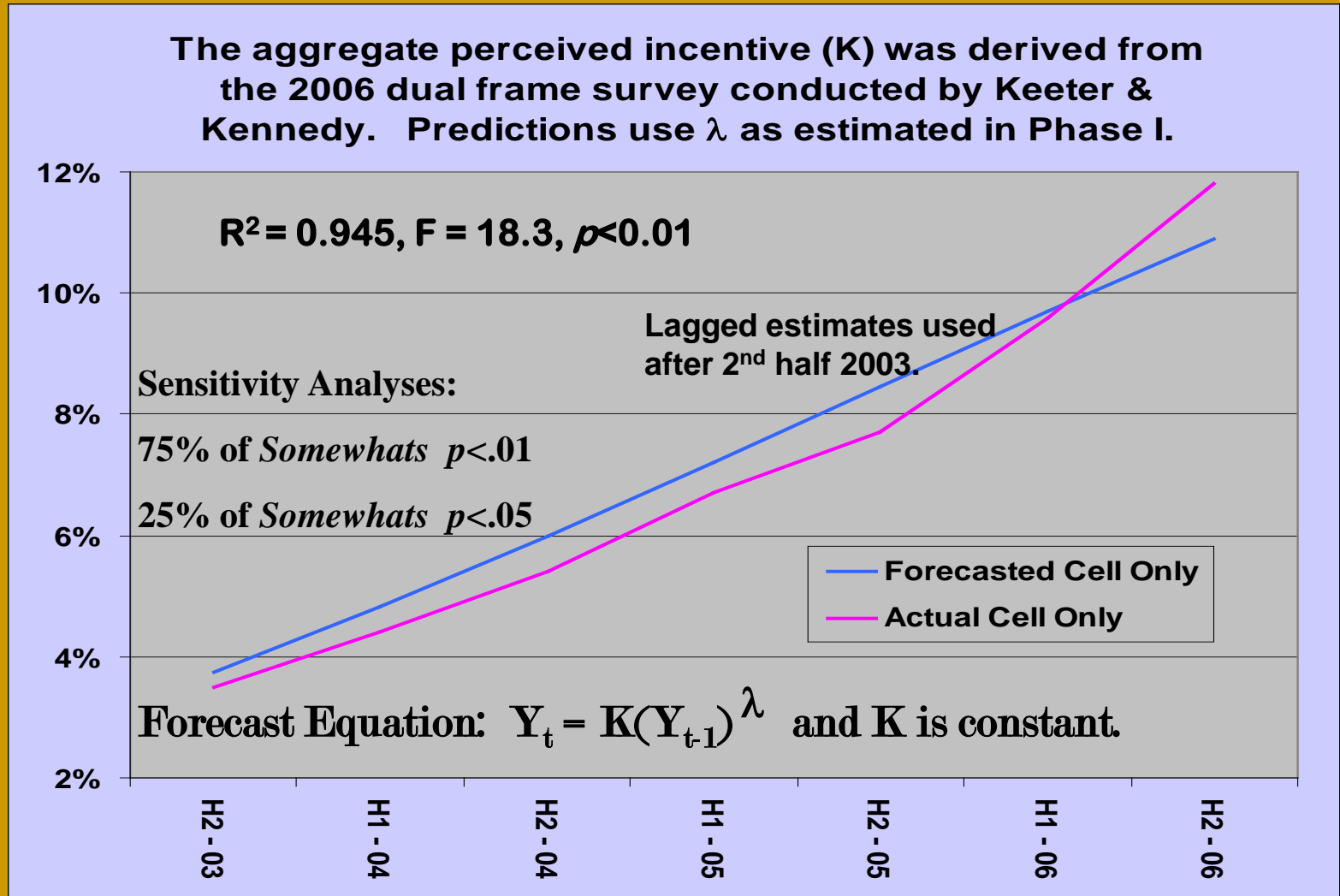


Phase II uses the fact that an aggregate perceived incentive, K , can be derived from data on the proportion of survey respondents (T) who would elect wireless only.

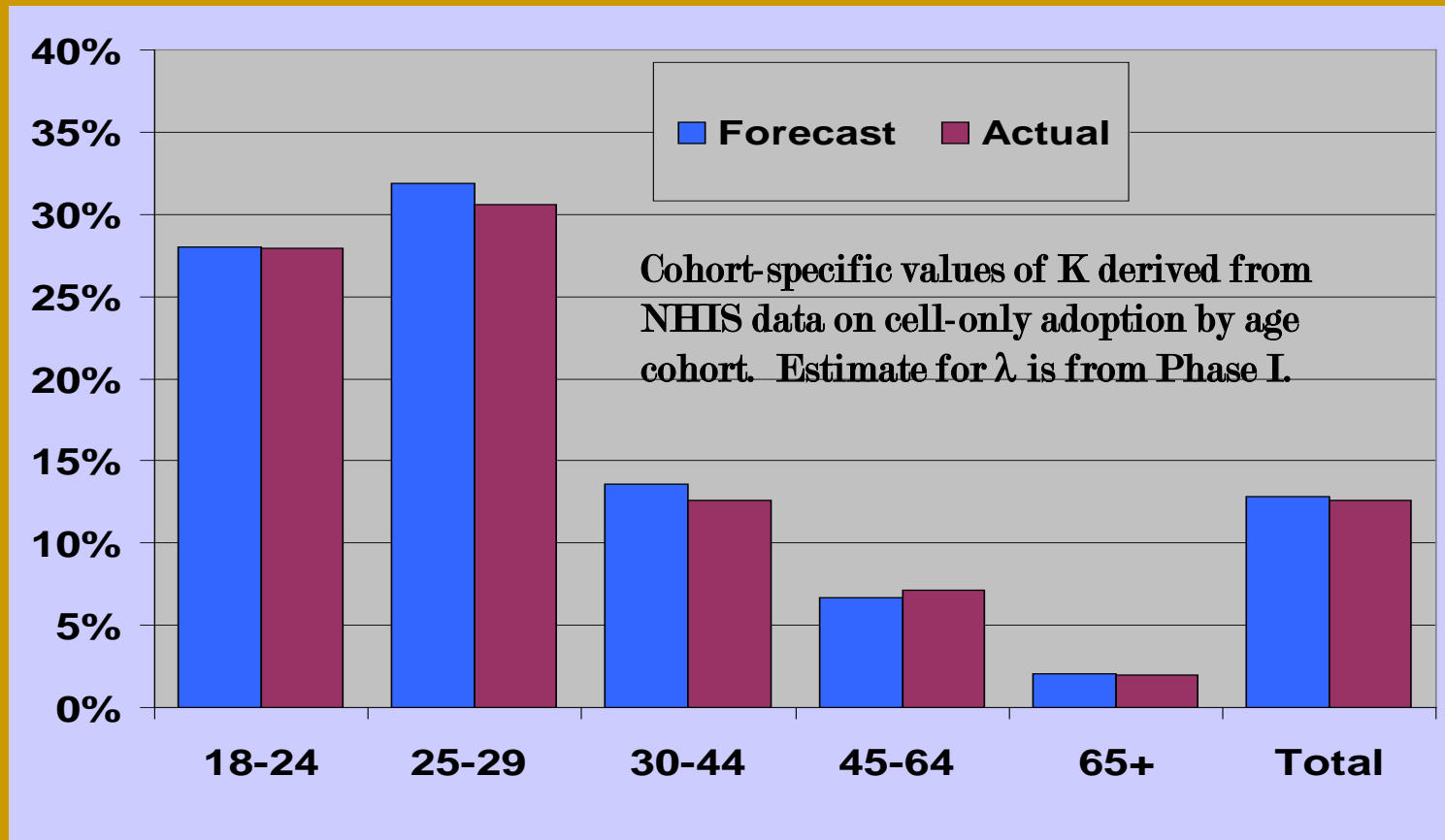
- We can think of the the aggregate perceived incentive as some constant that summarizes the implications of all the individual incentives: $\ln(K) = \Sigma b_i \ln(X_i)$.
- When adoption reaches the equilibrium target, T , it must be the case that $\ln(T) = \ln(K) + \lambda \ln(T)$
- So that the aggregate perceived incentive that describes the dynamic approach path to T given λ can be computed as

$$\ln(K) = \ln(T) - \lambda \ln(T)$$

Phase II: Is the rate of habit retention the same in the adoption of both *wireless* and *wireless only* lifestyles?

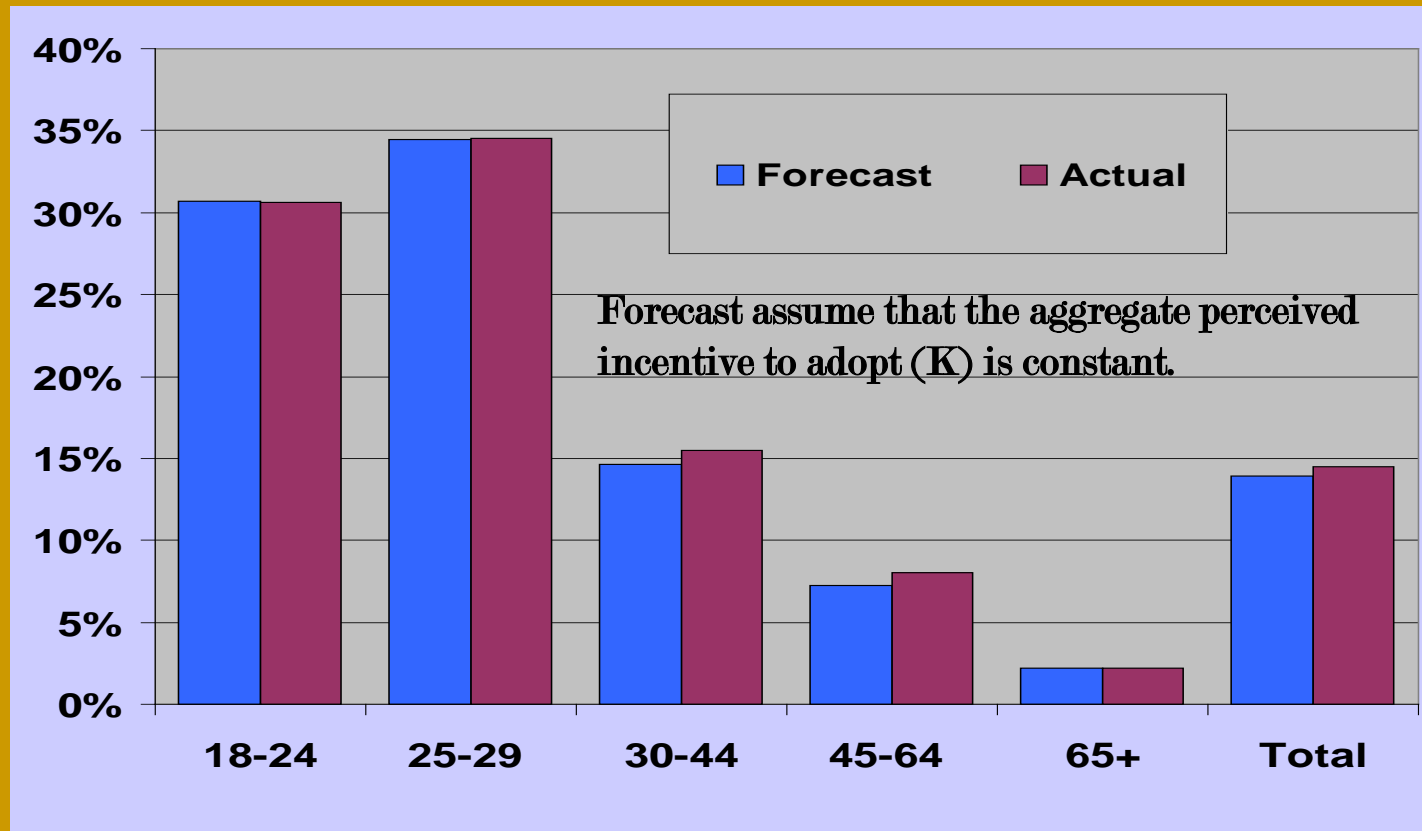


Phase III: We estimate models by age cohort. Tests indicate forecasts should be accurate and forecast results for I 2007 track fairly well...

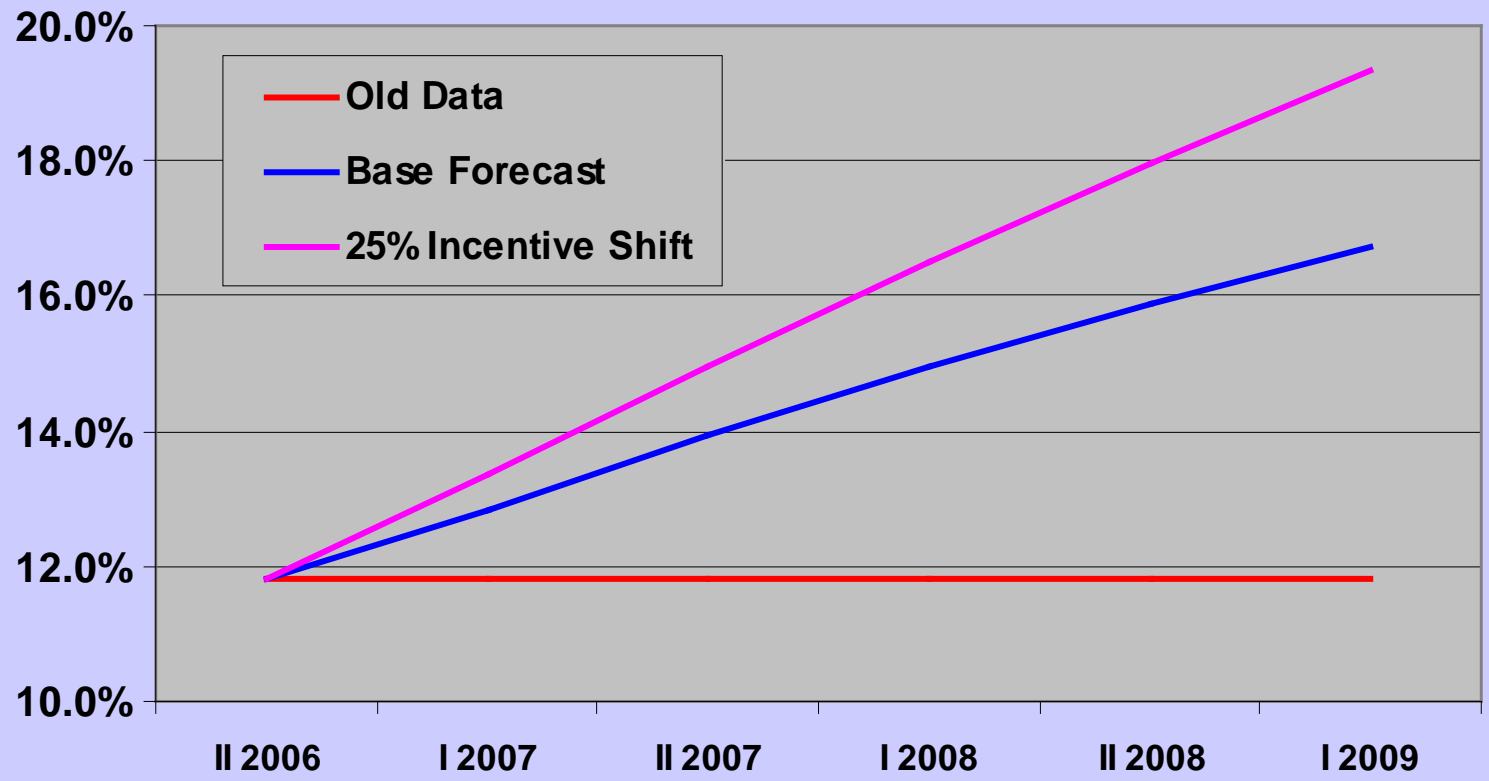


$Y_t = K(Y_{t-1})^\lambda$ and Y_{t-1} is actual percent for 2nd half of 2006.

... and results for H 2007 also track fairly well.



$Y_t = K(Y_{t-1})^\lambda$ and Y_{t-1} is forecasted percent for 2nd half of 2006.



New Research

- Wireline-Only Model
- The Impact of Aging on Communications Lifestyle

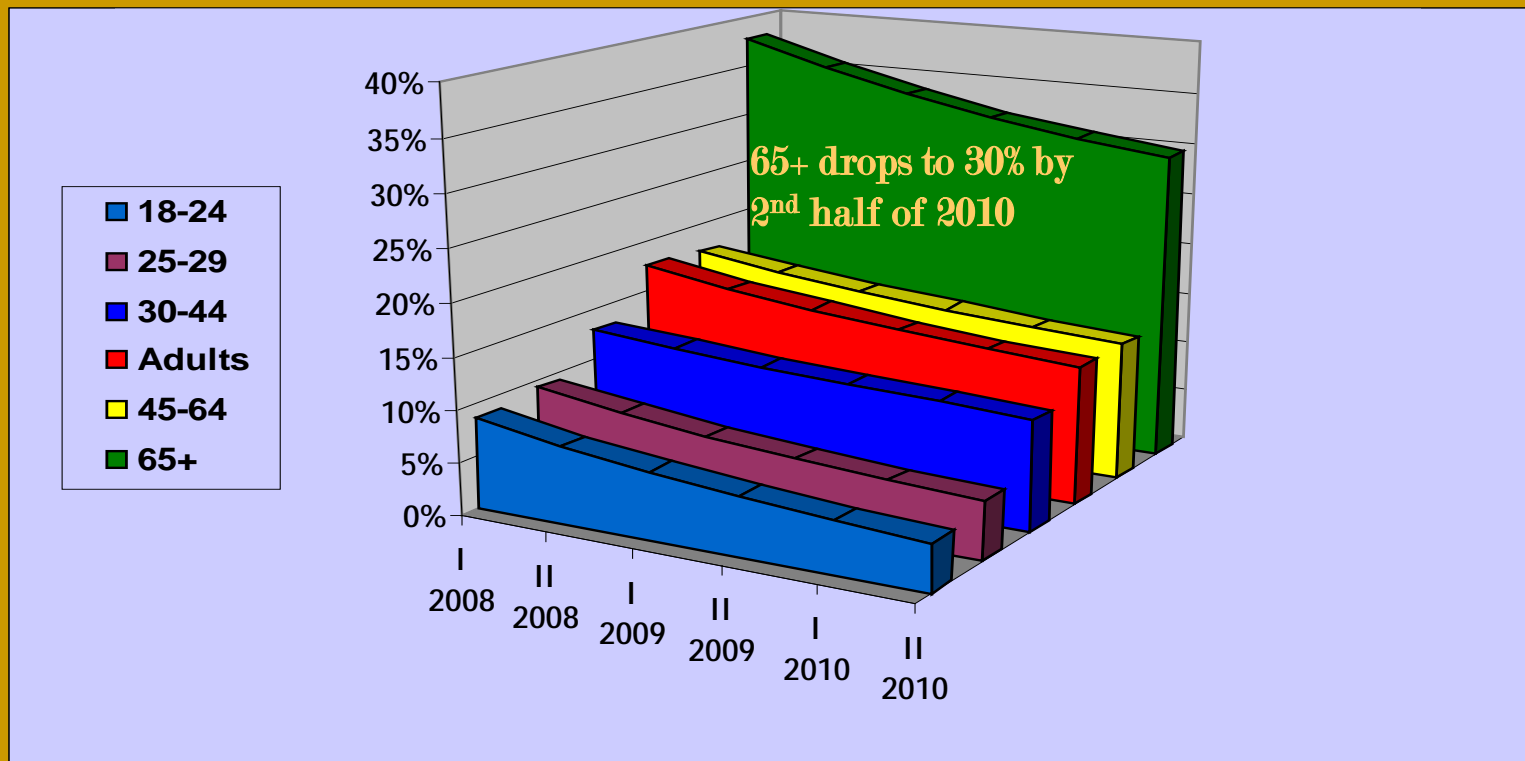
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NHIS changes that improved reporting of wireline status decreased the data available for estimating models of “Wireline Only.”

Report Period	Wireline Only	Wireline and Cell	Wireline with Cell Unknown
II 2006	27.3%	48.1%	10.5%
I 2007	20.8%	63.3%	1.7%

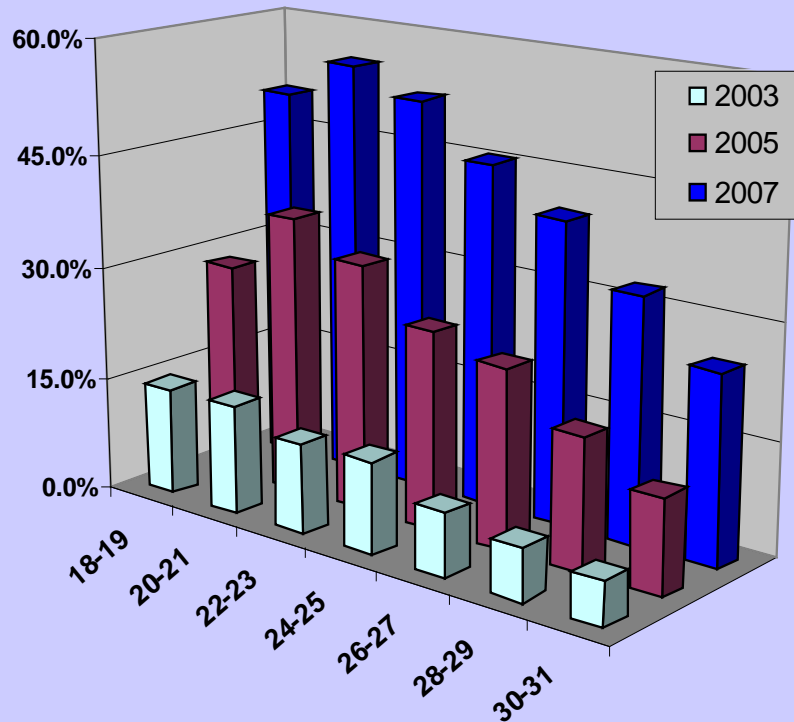
- Efforts to use the earlier data (2003-06) did not succeed.
- Consequently, 2007 quarterly data were used to derive perceived incentives by age cohort.

Model implies that two years from now only about 5% of adults under 30 and 13% of all adults will be “Wireline Only”



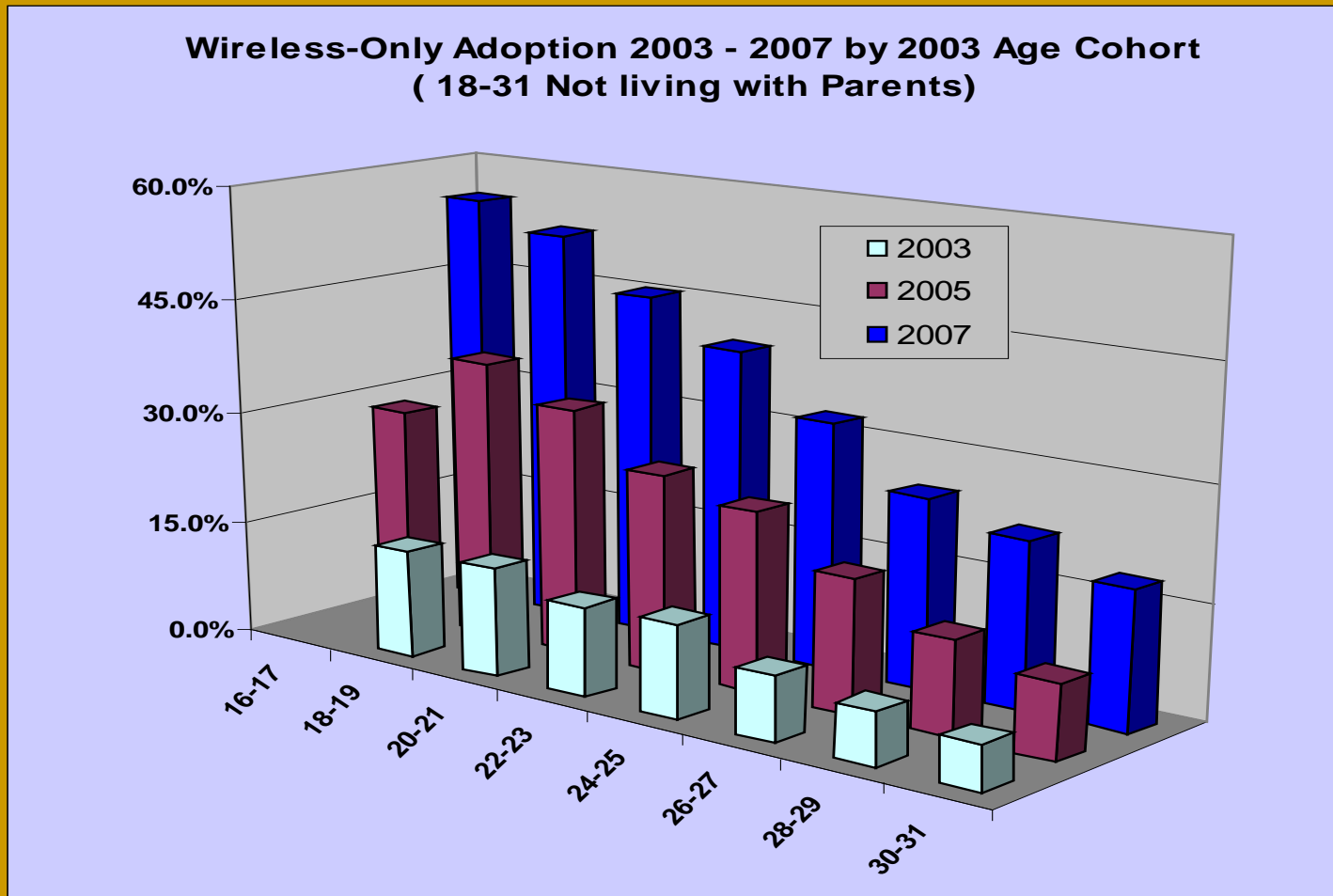
Getting Older: one might conclude from cross section data that the tendency to adopt the cell-only lifestyle peaks at age 20-21.

Wireless Only Adoption 2003 - 2007 by Age Cohort
(18-31 Not Living with Parents)

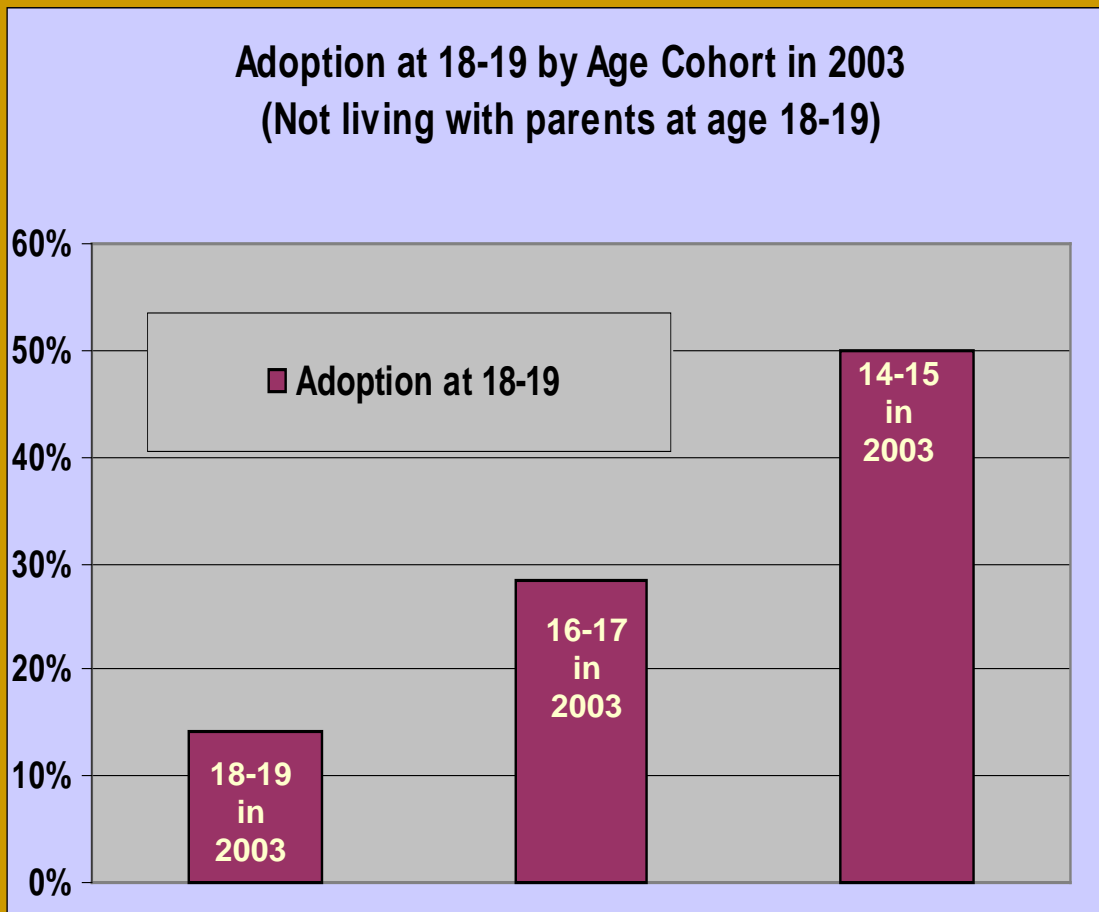


Among those under 30, the statistics for those not living with parents better reflect the choices of that age group. In the 2nd half of 2007 the adoption rate for the 49% of those 18-24 not living with parents was 53% compared to 10% for those 18-24 who were living with parents.

However, the picture over time suggests a different story: the perceived incentive to adopt is strongest among the youngest and is retained given aging.



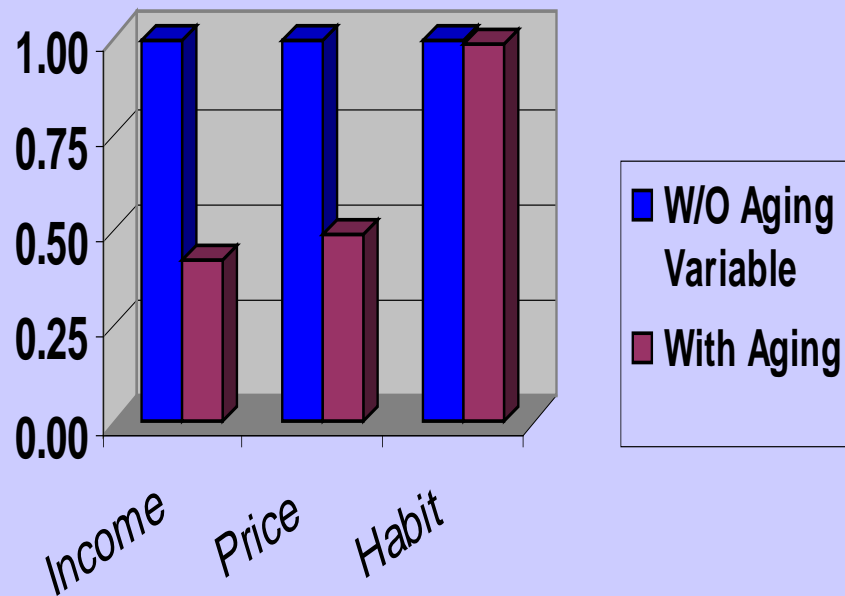
A comparison of adoption levels at age cohort 18-19 for those who were under 18 in 2003 also suggests that enthusiasm increases among younger teenagers.



Vesa Kuusela reports that Finnish cell-only families with children grew from 2% to 40% from 1996 to 2005, a statistic which suggests that Finns retain the preference for cell only as they age. The short history available in the U.S. also implies that the lifestyle is retained as younger adults mature and as teenagers become adults.

The aging effect explains a substantial portion of the increasing incentive to adopt the wireless lifestyle.

Comparison of Absolute Coefficient Values (using indices)



- The inclusion of aging in the model explaining wireless adoption substantially reduces the impact of price and income changes.
- The rate of habit retention changes only slightly.
- The role of *incentive shifts* in wireless-only adoption is smaller than we thought, and we may well be able to predict a substantial part of these target shifts based on the aging of those now in younger age cohorts.

Confirming and using the aging effect: implications and research plan

Implications

- Negligible impact on forecasts through 2009
- Substantial impact on what we would expect over the next ten years
- Restructured model to forecast adoption of baseline age cohorts over time

Confirming the Aging Affect

- Collaboration with Vesa Kuusela on the Finnish experience
- Develop data set on wireless adoption by age cohort from the Consumer Expenditure Interview Survey starting from mid 1990's

Thank you for the invitation and thanks to:

- Paul Lavrakas and three unknown reviewers for their helpful comments and suggestions
- Scott Keeter, Courtney Kennedy and the Pew Center for their 2006 dual frame survey, *The Cell Phone Challenge to Survey Research*, a study that provided us key information for model testing
- Stephen Blumberg and Julian Luke for their patience with all my questions as I worked to develop a detailed summary data set that reconciled to their published data

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