Forecasting Demand for internet Services Willingness-to-pay for VoIP

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Experts Dialogue:
Adjusting Forecasting Methods to the Needs of the Telecommunications Sector

International Telecommunication Union

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Outline

- Objectives
- What is VoIP?
- Market Size for VoIP
- Demand for VoIP
- Discussion
- Future Research

Objectives

1. What is VoIP?
2. Identify “Drivers” of VoIP
3. Use Variation of Contingent-Valuation Procedures to Estimate Demand for VoIP
4. Estimate Elasticities
5. Comment on Market Size and Market Potential

Consider

- Market for VoIP small
- No Historical Demand or Price Series
- Business vs Residential Demand
- Surveys have been used to:
  - Identify level of awareness
  - Identify level of interest
- Goal – to estimate VoIP price elasticity

VoIP – Killer Application?

Or, are we simply looking at a phone call?

Packet Switching

- Circuit Switching
  - Connection made between your telephone and the other party's line, opening the circuit.
  - You talk for a period of time, hang up. At that point the circuit is closed, freeing your line.
  - A 10 minute conversation consumes about 9.4 megabytes. Much of the transmitted data is wasted (one talks the other listens, dead air etc) -- over 75% wasted

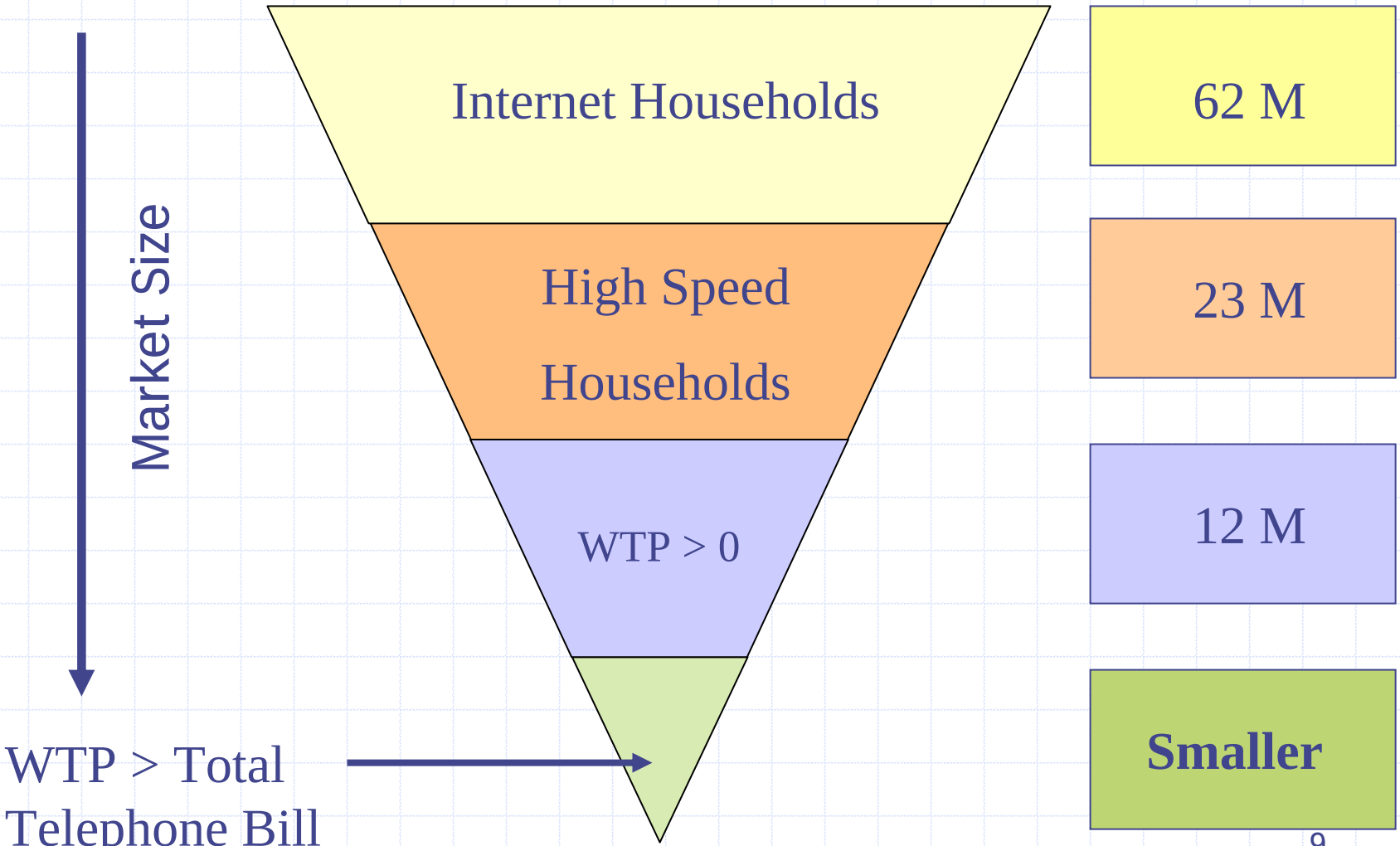
Voice over IP Protocol*

- “Voice over Internet Protocol (VoIP) is a common term that refers to the different protocols that are used to transport real-time voice and the necessary signaling by means of Internet Protocol (IP). In another word, it allows the user to place a call over IP networks.“

http://www.personal.psu.edu/users/f/x/fxz122/project/voip.html

VoIP Forecast

How Large is the VoIP Market?



VoIP “Drivers”

Telephone Bill

$42

Average local & LD bill

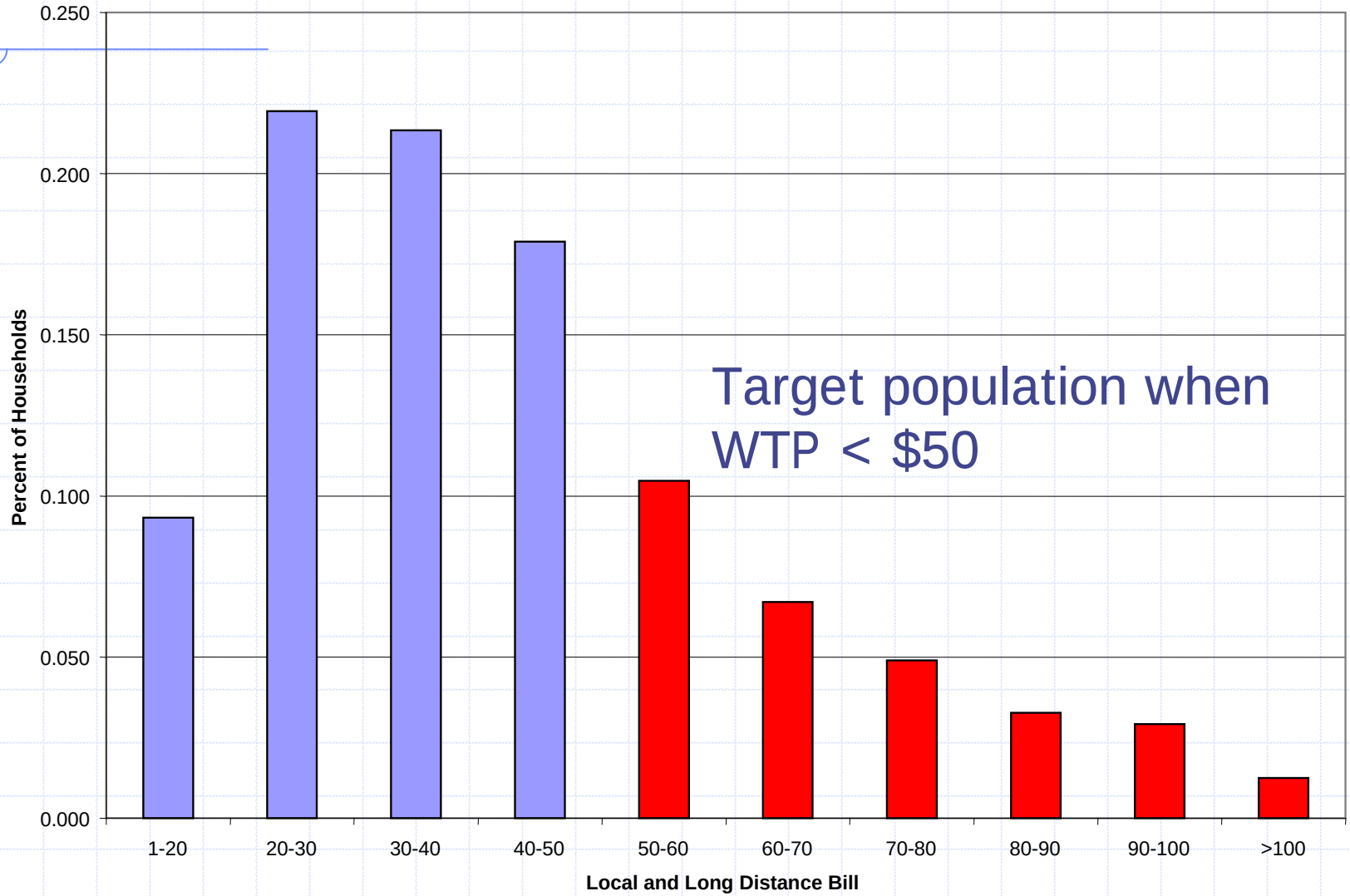
Broadband Penetration

(23-24)%

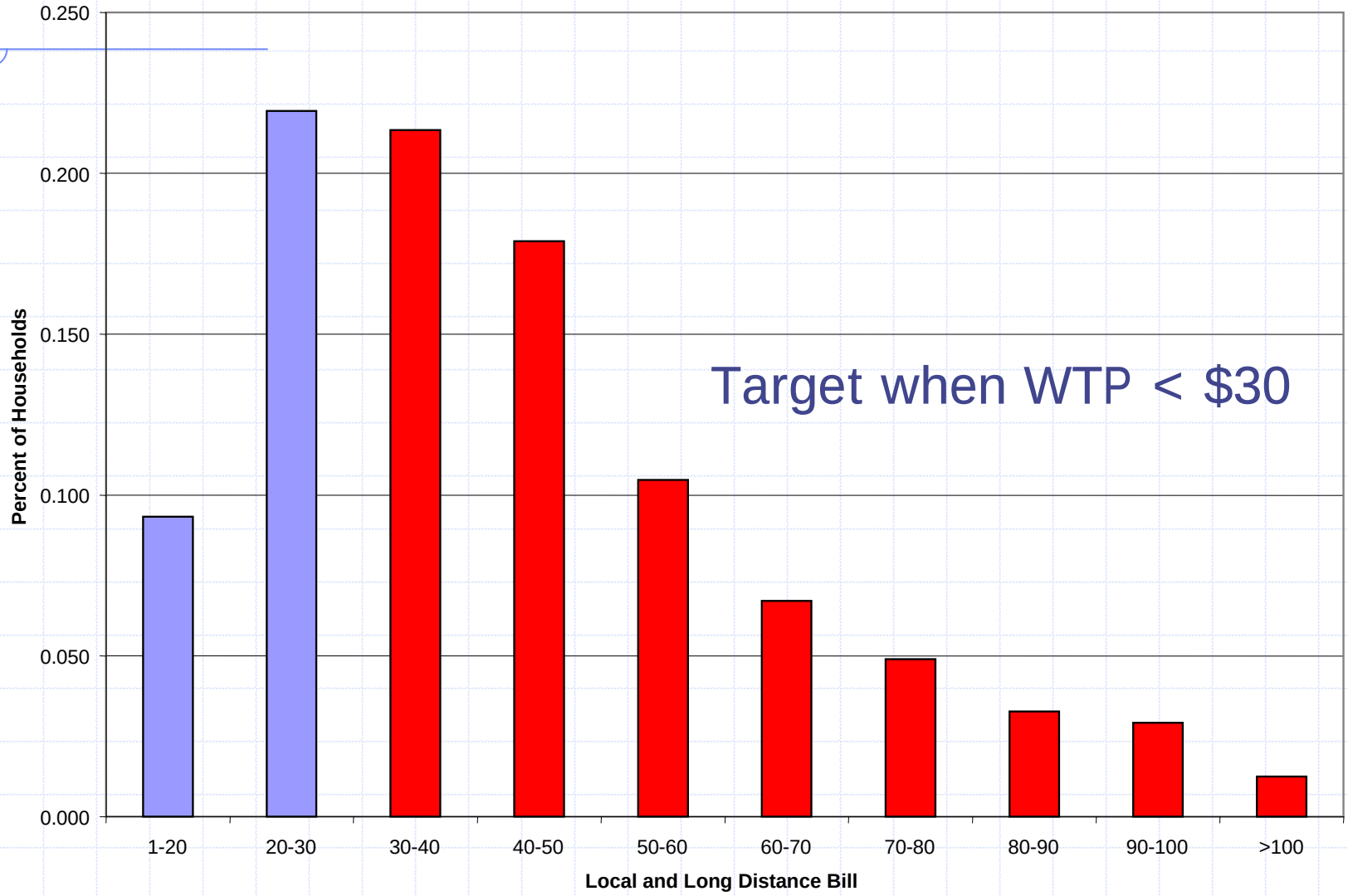
Broadband % of households

Distribution of Telephone Bill

Distribution of Total Telephone Bill - I



Distribution of Total Telephone Bill – II

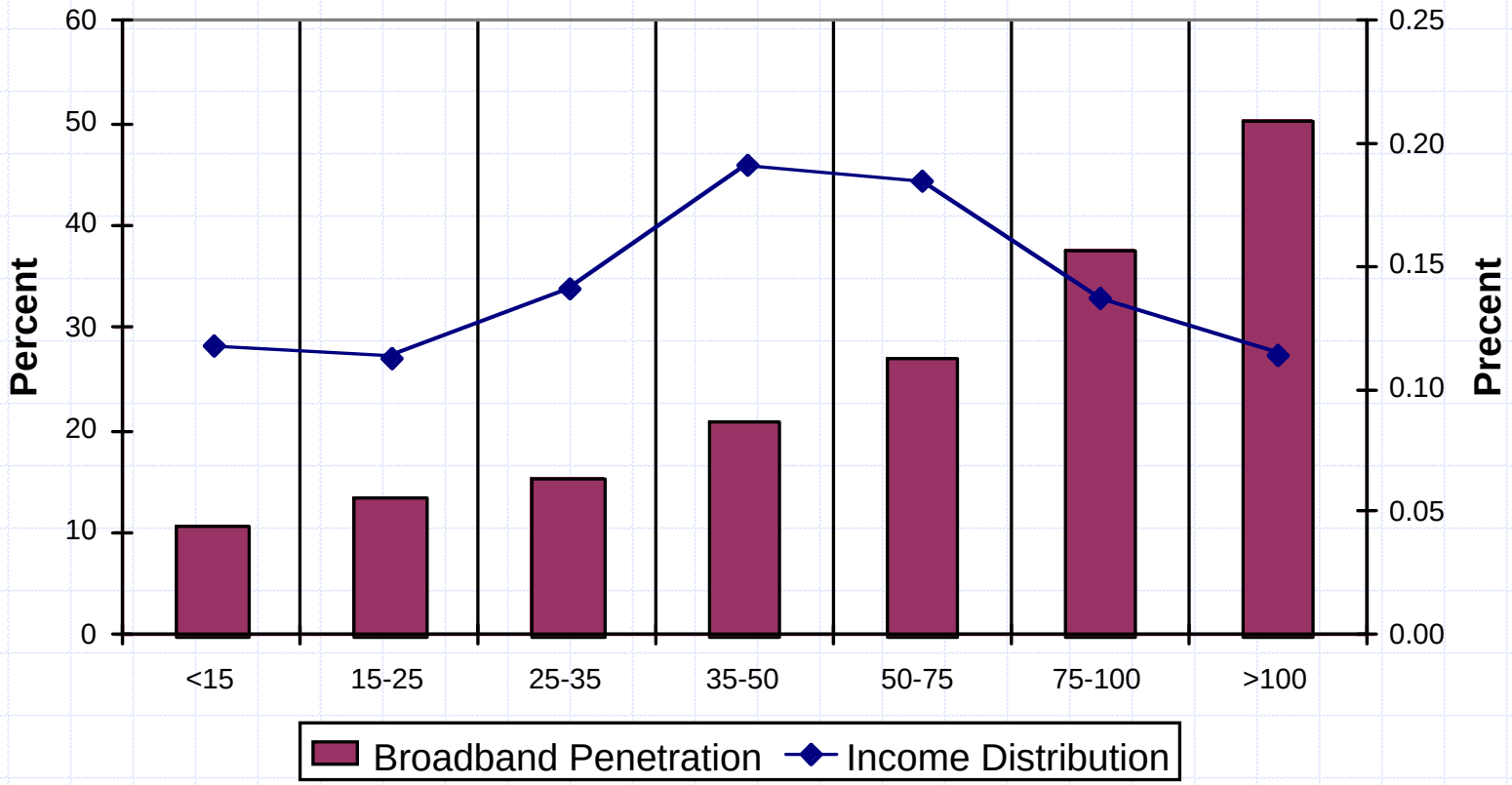


Broadband Demand

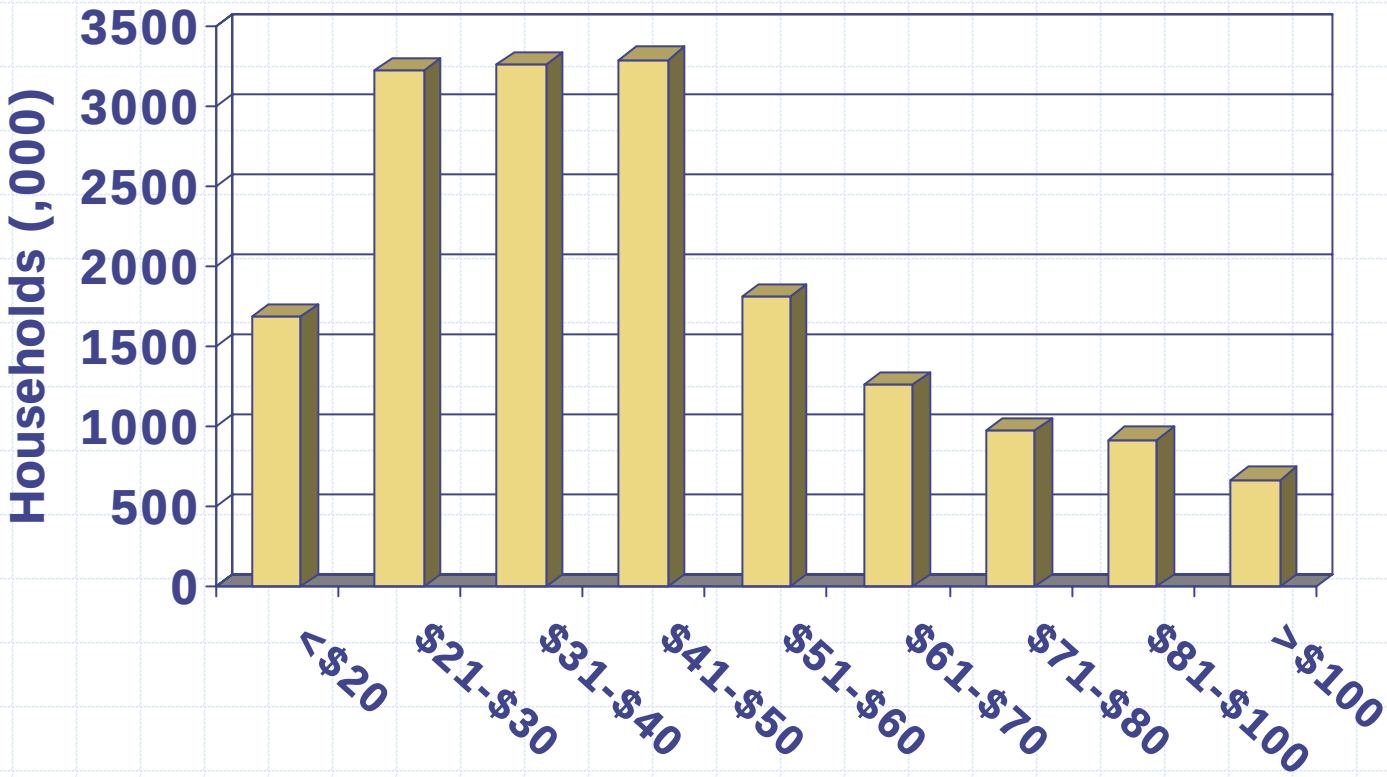
Key Driver: Broadband Growth

- Broadband Availability
  - An issue only for Best Practice VoIP
- What will Drive Broadband Growth?
  - Content – Gaming – Entertainment -- Shopping
  - Multimedia and video
- Price
  - Discounting
  - Bundles
    - Triple Play (Voice – Video – Data)
    - Multimedia + Call Management

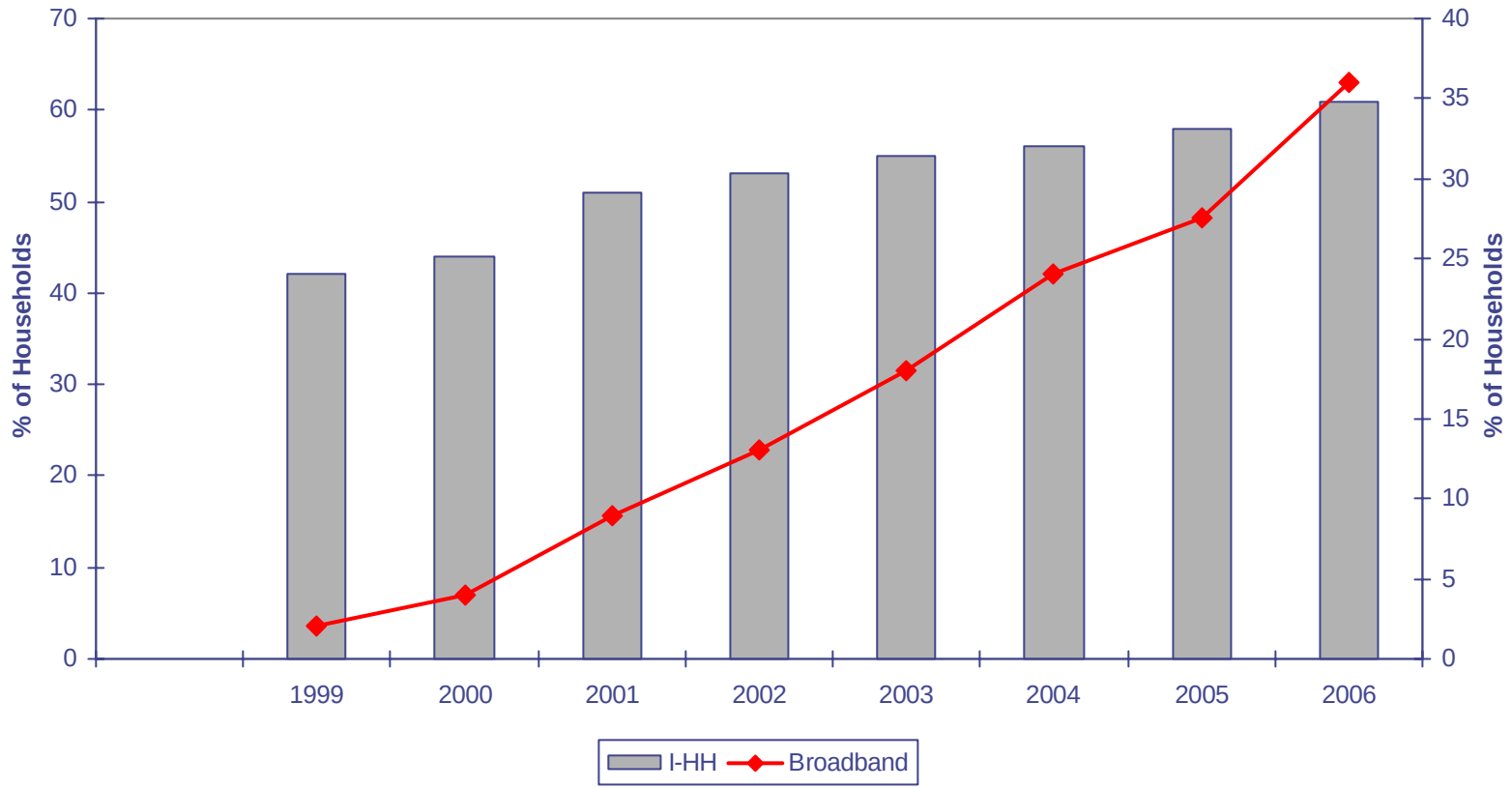
Distribution of Income & Broadband



Broadband and the Telephone Bill



Broadband Forecast



Source: CentrisPlus

The Demand for VoIP

Willingness to Pay

Demand for VoIP Service

- Focus is on the price of the service – thus economic value associated with a service is generally bounded
- Application is directed towards the estimation of price elasticities

Lognormal Demand Curves

- Let p_{oi} be the tolerance price of the ith household

  p be the actual market price

- Then $q_i = 1$ if $p_{oi} \geq p$

  $q_i = 0$ otherwise

- Assuming that p_{oi} is distributed as a lognormal with parameters μ_p and σ_p^2

Lognormal Demand

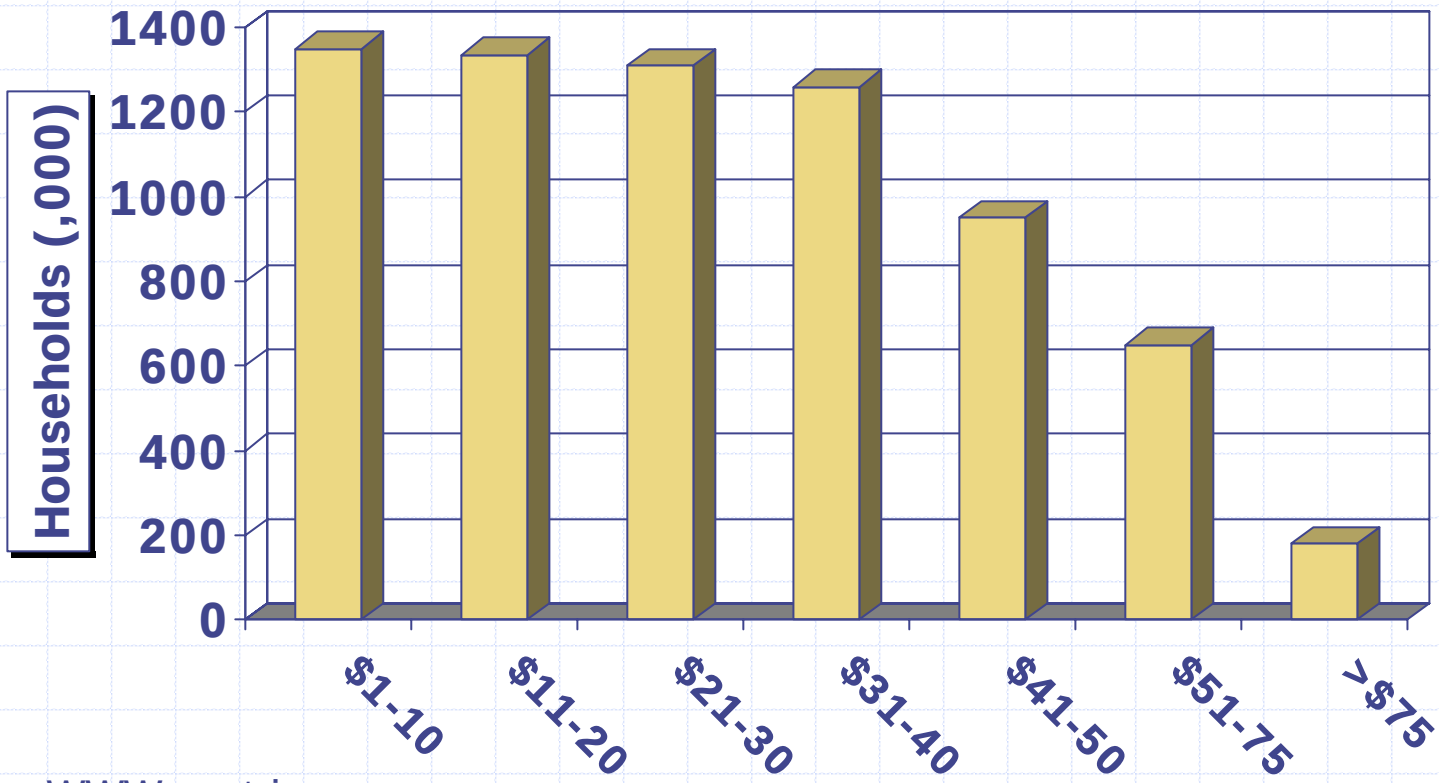
We have:

$$\mathrm{P}(q_i = 1 \mid p) = \mathrm{P}(p_{oi} \geq p) = 1 - \Lambda(p; \mu_p, \sigma_p^2)$$

Let Q represent the expected proportion of buyers we have:

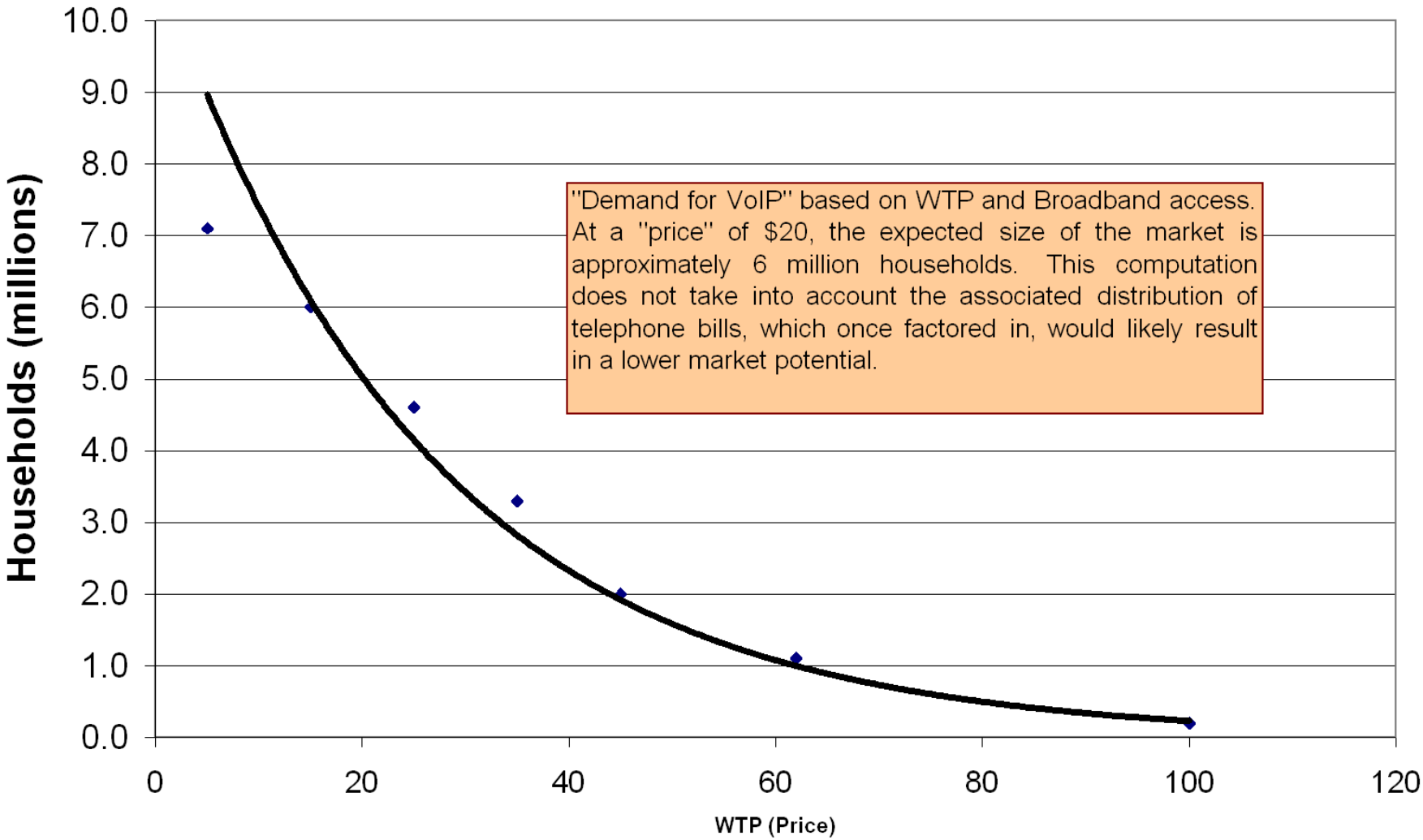
$$\mathrm{Q}(p) = 1 - \Lambda(p; \mu_p, \sigma_p^2) = \Lambda(1/p; -\mu_p, \sigma_p^2)$$

Willingness to Pay Given Broadband

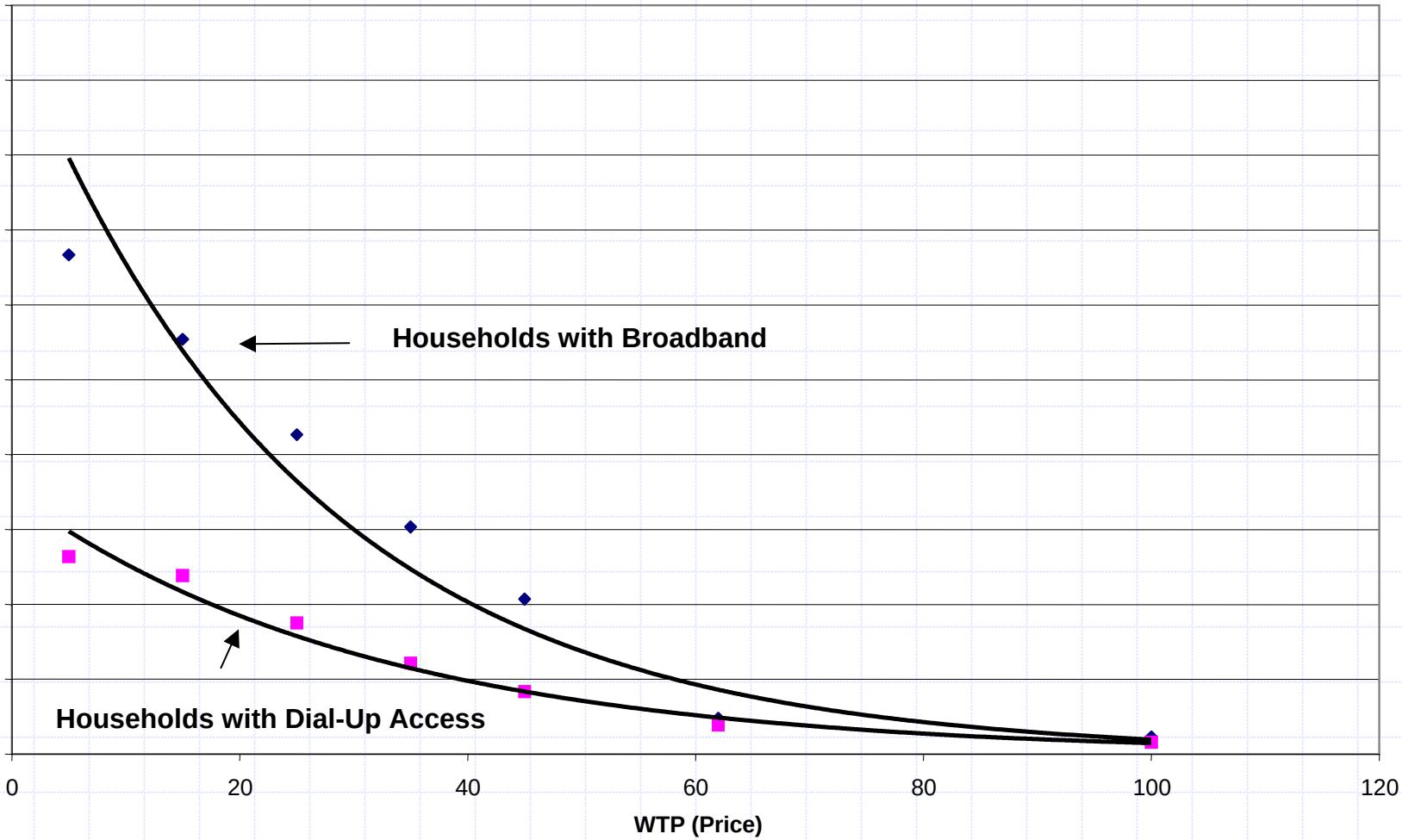


Source: WWW.centris.com

Willingness to Pay for Voice-Over-IP



Willingness to Pay for Voice-Over-IP



Sample

- 8,000 survey responses for from Q1, 2004
- Based on CENTRIS^{SM} Omnibus survey
  - National RDD sampling
  - CENTRIS^{SM} tracks over 75 communications, entertainment and technology areas on a daily basis, at the household level

www.Centris.com

VoIP Elasticities

WTP	Broadband Households	Non Broadband Households*
$1-$10	-0.20	-0.80
$11-$20	-0.59	-1.12
$21-$30	-0.98	-1.44
$31-$40	-1.37	-1.76
$41-$50	-1.76	-2.08
$51-$75	-2.54	-2.72

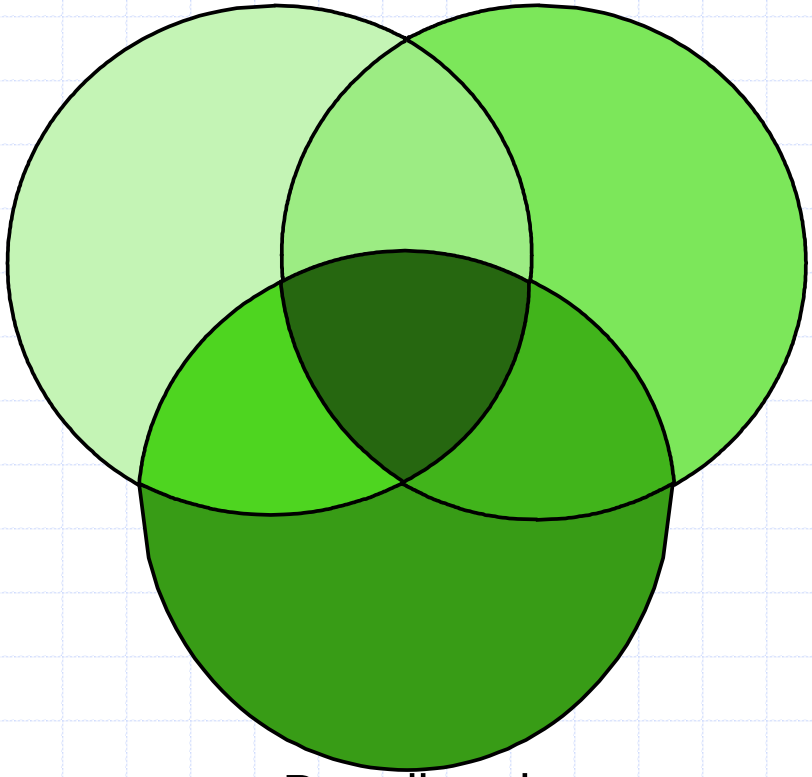
* Assuming $20 month for broadband

Market Simulations

Market Potential - I

Price (WTP)
<$40 12 million households

Telephone bill
>$40 about 41 million households

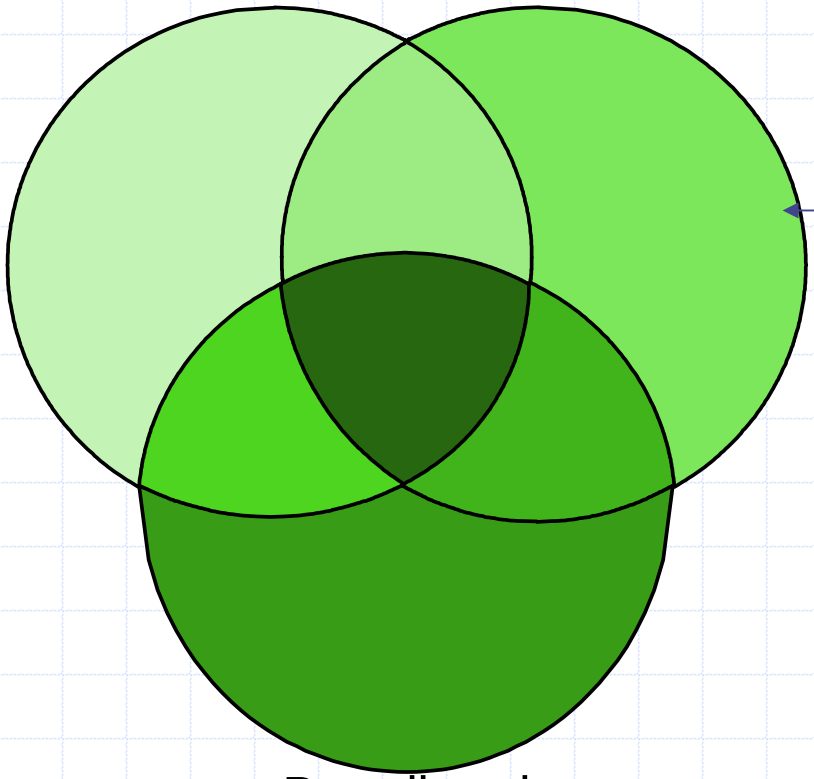


Broadband
24 million households

Market Potential - II

Price (WTP)
<$40 12 million households

Telephone bill
>$40 about 41 million households



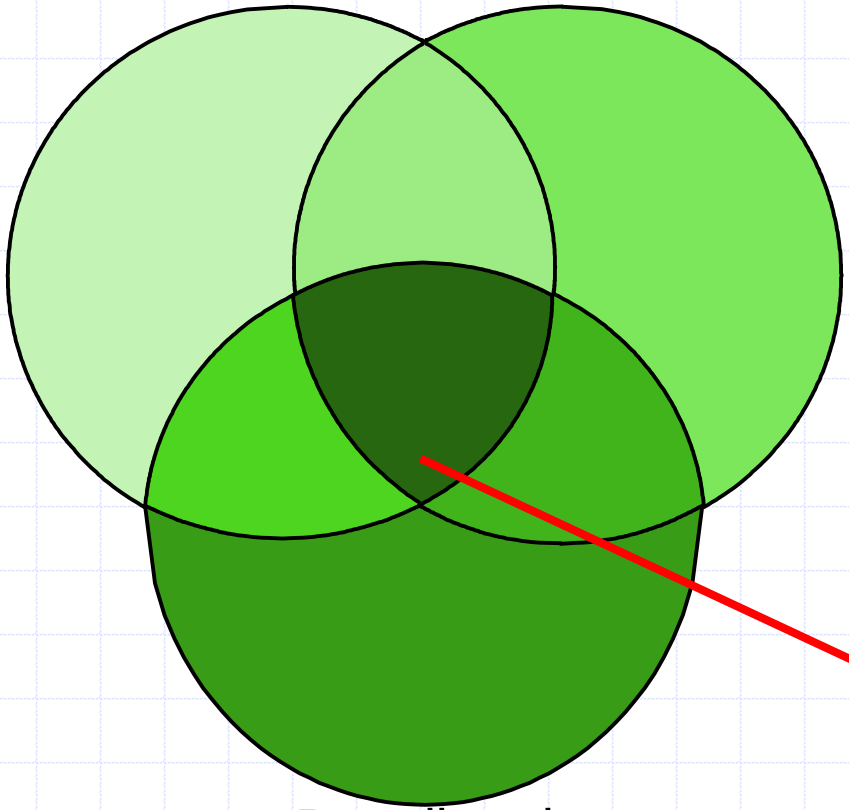
Broadband
24 million households

8,952,000

Market Potential - III

Price (WTP)
<$40 12 million households

Telephone bill
>$40 about 41 million households



2,300,000

Broadband
24 million households

Discussion

- **Price clearly matters**
- **Broadband penetration matters**
- Focusing simply on “interest in VoIP” leads to significant over estimation of market size
- Insight requires understanding the relationships between “price” and the distribution of telephone bills and between “price” and the distribution of income

Discussion

- Quality of service not addressed
- Focus was only on VoIP delivered over the Internet
- Security: Virus, Trojan Horse, Worms and Spam
- Competitive RBOC responses not incorporated into the demand model (e.g. Verizon's Freedom plan)

Discussion

- Regulation
  - Classify VoIP as a telephone service
    - USF obligations
    - Access charges
    - 911 requirement
    - Licensing, taxation policies
  - State and Federal regulation

VoIP References

- **Service Providers**
  - http://www.voip-calculator.com/directory/search.htx?page=1&category=1
  - http://www.voip-info.org/wiki-VoIP+Service+Providers
- **FCC**
  - http://www.fcc.gov/voip
- **General Reference**
  - http://www.voip-info.org/tiki-index.php
  - http://www.voip-info.org/wiki-VOIP+sites
- **Tutorials**
  - http://www.iec.org/online/tutorials/vfoip/
  - http://www.cse.ohio-state.edu/~jain/refs/ref_voip.htm
  - http://computer.howstuffworks.com/ip-telephony5.htm
  - http://www.nact.com/documents/VoIP%20Tutorial.PDF

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