The Demand for Residential VoIP Services:
Summary of Recent Research

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Agenda

- Overview
- Size of Market
- Demand for VoIP
- Simulations/Results
- Discussion/Cautions

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Overview

- What is VoIP?
- Who Wants to Buy VoIP?
- Market Factors

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What it is not

- Circuit Switching
  - Direct connection, opening a circuit.
  - Hang up, circuit is closed
  - Ten minute conversation
    - 9.4 Megabytes
    - Transmitted data wasted -- over 75%
    - One talks the other listens

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Packet switching - VoIP

- “Voice over IP (VoIP)
  - Protocols that transport real-time voice and signaling via Internet Protocol (IP)
  - Allows the user to place a call over IP networks

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

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- What is VoIP?
- Who Wants to Buy VoIP?
  - Forrester Research Consumer Panel, 10 January 2005

VoIP Market Off to a Slow Start

- Adoption limited
  - Only 23% of HH aware of VoIP
  - Less than 1% pay for VoIP
- Weak Interest
  - Less than 10% “interested” in VoIP

Forrester Research Consumer Panel, 10 January 2005

Profile of Current Users

- Technically Proficient Users
- Users Younger & Mobile
- Users – Bargain Hunters

Forrester Research Consumer Panel, 10 January 2005

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- Who Wants to Buy VoIP?
- Market Factors
  - Relatively small market
Overview

- What is VoIP?
- Who Wants to Buy VoIP?
- Market Factors
  - Relatively small market
  - Distribution of Telephone Bills
    - The Higher the Bill, the Larger the VoIP Benefit

Key Driver: Broadband Growth

- Broadband Availability
  - Only for Best Practice VoIP
Key Driver: Broadband Growth

- Broadband Availability
  - Only for Best Practice VoIP
- Broadband Growth Drivers?
  - Content – Gaming – Entertainment – Shopping
  - Multimedia and video

Key Driver: Broadband Growth

- Broadband Availability
- Broadband Growth Drivers?
- Price
  - Discounting
  - Bundles
    - Triple Play (Voice – Video – Data)
    - Multimedia + Call Management

Distribution of Income & Broadband

Outline

- What is VoIP?
- Who Wants to Buy VoIP?
- Market Factors
- Modeling Demand for VoIP
  - Willingness to pay

Modeling Demand for VoIP

- Focus on the Price
  - Economic value bounded
- Estimation of Price Elasticities

Lognormal Demand Curves

- Let:
  - $p_{io}$ be the tolerance price of the $i^{th}$ household
  - $p$ be the actual market price
- Then
  - $q_i = 1$ if $p_{io} > p$
  - $q_i = 0$ otherwise
- Assuming that $p_{io}$ is distributed as a lognormal with parameters $\mu_p$ & $\sigma_p^2$
We have:
\[ P(q_i = 1|p) = P(p_i > p) = 1 - \Lambda(p; \mu_p, \sigma_p^2) \]

Let \( Q \) represent the proportion of buyers we have:
\[ Q(p) = 1 - \Lambda(p; \mu_p, \sigma_p^2) = \Lambda(1/p; \mu_p, \sigma_p^2) \]

**Lognormal Demand**

**Data**

- Sample of over 50,000 households from March, 2004
- Centris random digit dialing (RDD) omnibus survey
- Incorporated Willingness to Pay questions

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**Willingness to Pay for Voice-Over-IP**

<table>
<thead>
<tr>
<th>WTP</th>
<th>Broadband Households</th>
<th>Non Broadband Households*</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1-10</td>
<td>-0.20</td>
<td>-0.80</td>
</tr>
<tr>
<td>$11-20</td>
<td>-0.59</td>
<td>-1.12</td>
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<td>$21-30</td>
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<td>$31-40</td>
<td>-1.37</td>
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<td>$41-50</td>
<td>-1.76</td>
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<tr>
<td>$51-75</td>
<td>-2.54</td>
<td>-2.72</td>
</tr>
</tbody>
</table>

* Assuming $20 month for broadband

**Elasticities**
Market Potential I
- Price (WTP)
  - Telephone bill
  - <$40 12 million households
  - >$40 about 41 million households

Market Potential II
- Price (WTP)
  - Telephone bill
  - <$40 12 million households
  - >$40 about 41 million households

Market Potential III
- Price (WTP)
  - Telephone bill
  - <$40 12 million households
  - >$40 about 41 million households

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Discussion/Cautions
- Price Matters
- Broadband Penetration Matters

Discussion/Cautions
- Price Matters
- Broadband Penetration Matters
  - Focusing simply on "interest in VoIP" leads to significant over estimation of market size
Price Matters

Broadband Penetration Matters
- "interest in VoIP" leads to overestimation of market size
- Relationships between "price" & the distribution of telephone bills & between "price" & the distribution of income important

Quality of service not addressed

Potential regulatory rulings not incorporated into WTP

Focus only on VoIP delivered over the Internet

RBOC responses not incorporated (e.g. Verizon’s Freedom plan)

ALL OF WHICH WILL LEAD TO LOWER ESTIMATES