Competitive Mobile Targeting

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What's location-based mobile targeting?

- Pinpoint consumers' locations and provide location-specific advertisements on their mobile devices.
  - Spending from $2.9 billion in 2013 to $4.9 billion 2014.
  - Top two categories: restaurants and retail
  - Push (e.g., SMS) or Pull (mobile apps); Opt-in or Opt-Out

Geo-fencing around one's own store(s)

- Starbucks, Toys R Us, Talbots, Peets Café, Kohls

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BEST BREW
HOUSE BLEND
Best Brew:
House Blend,
8 oz
$12.99
add to list
ON THE SPOT DISCOUNT!
Don't move! Claim this coupon within the next 30 seconds and save 50% on Best Brew House Blend 8 oz.
claim coupon
:28
SECONDS LEFT
PRESENT COUPON AT CHECKOUT
ing bags in our pantry since it is out of stock so
often. Pick some up. There is a good change
you'll like it as much as we do. Also, look for "on

Geo-conquesting example

- The Outback campaign used 5 and 10 mile geofences around various competitor restaurant locations

- Dunkin donuts

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General effects of targeting

- Expand demand
- With competition: intensifies price competition within each consumer segment (e.g., at each location)
- Net effect often negative (e.g., Thisse and Vivies 1988, Shaffer and Zhang 1995)

Related literature

- Competitive targeting
  - Often backfires (e.g., Thisse and Vives 1988, Shaffer and Zhang 1995)
  - Lal and Rao (1997) multidimensional targeting strategies
  - Shaffer and Zhang (2002) one-to-one promotions with asymmetric firms

- Behavior-based pricing (BBP)
  - Prisoner's dilemma (Fudenberg and Tirole 2000, Villas-Boas 1999, Zhang 2011)
  - Benefits of BBP (Pazgal and Soberman 2008, Shin and Sudhir 2010)

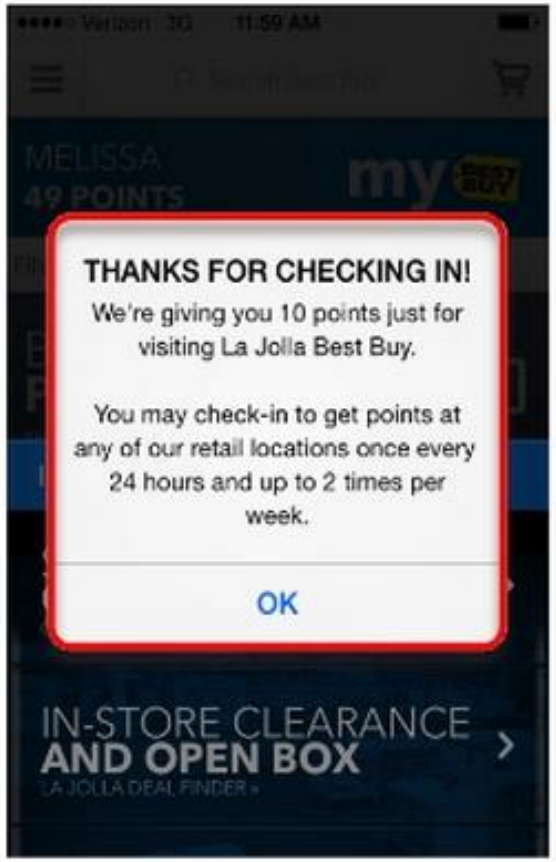
- Mobile marketing
  - Ghose, Goldfarb and Han (2013)
  - Luo et al. (2014), Fong, Fang and Luo (2014)

How is mobile different?

- Price/discount is based on real-time locations
- A consumer can change his/her “segment” by moving across different locations
- Firms need to think about how to “guide” such movements by balancing prices across locations ➔ reduced competition ➔ increased profitability of targeting

Are consumers strategic?

- 54% have used mobile coupons
- 60% of coupon users travelled to obtain a coupon
- Would you be willing to travel to a particular location to obtain such a coupon?
  - Yes (28%)
  - It depends on the value of the coupon and the distance I have to travel (62%)
  - No (10%)



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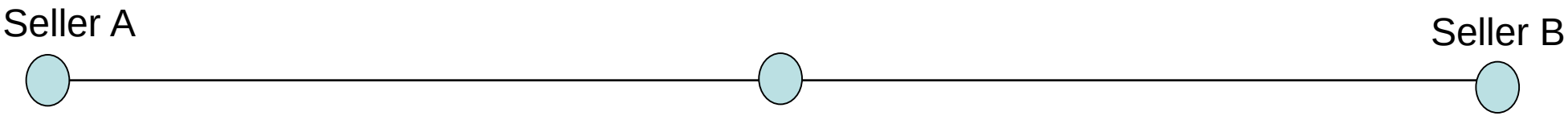
A model of mobile targeting



$u_A^i = V - sy_A^i - td_A^i - p_A^i$

$u_B^i = V - s(1 - y_A^i) - td_B^i - p_B^i$

- Sellers A and B located at the two ends of the Hotelling line
- 3 unit masses of consumers, one at each end of the line and one in the middle
- Preferences are uniformly distributed between the two sellers with mismatch cost *s* within consumers at each location. Consumers incur travel cost *t* per unit distance travelled

- Firms can offer a different price at each of the three locations under mobile targeting

Table 1: Consumers' Total Cost of Buying under Mobile Targeting

	Consumers at location 0	Consumers at location ½	Consumers at location 1
Firm 1's price: Cost of buying from Firm 1	p_0 $p_0, p_{1/2}+t, p_1+2t$	$p_{1/2}$ $p_0+t, p_{1/2}+t, p_1+2t$	p_1 $p_0+2t, p_{1/2}+2t, p_1+2t$
Firm 2's price: Cost of buying from Firm 2	p_1 $p_0+2t, p_{1/2}+2t, p_1+2t$	$p_{1/2}$ $p_0+t, p_{1/2}+t, p_1+2t$	p_0 $p_0, p_{1/2}+t, p_1+2t$

Assumptions

- Existence of pure-strategy equilibrium w/ mobile targeting: $t<4s$
  - Otherwise firms fight over middle consumers very aggressively
- Cherry-picking option matters: $2s<t$
  - Otherwise prices are too similar across locations for consumers to cherry pick
- Local monopolies under uniform pricing: $V<2t+s$
- Possibility of geo-conquesting: $V>2t$

- Combined: $2s<t<4s$, $2t<V<2t+s$

What happens under uniform pricing?

- Each firm remains a local monopoly and all local consumers are served. Price and profit are both V-s

- If mobile targeting technology is available for free, uniform pricing equilibrium breaks down
  - If uniform price is high, charge lower price at middle to increase demand
  - If uniform price is low, charge higher price at base to increase margin

Avoiding consumers' cherry picking under MT

- If consumers cannot travel, optimal prices are *2t-s* at distance 1 and *s* at distance ½. At these prices, consumers at 0 have an incentive to cherry pick.
  - Firm can increase profit by preventing travel and pocketing their travel cost

- At least one cherry-picking constraint has to bind
  - Firm fights competitor out of its home base: $p_1 = 0$ and $p_0 = 2t - s$
  - $p_0 = p_{1/2} + t$ is binding

Equilibrium outcomes

- MT Prices: 2t-s, t-s, 0 to consumers located at distance 0, ½, 1; profit (5t-3s)/2.
  - The reason why mobile is more profitable than coupons: t-s>s in the middle

- All consumers are served in equilibrium.

- *A firm's equilibrium price and profit under mobile targeting increase with t and decrease with s.*
  - When t increases, harder for consumers to cherry pick and firms increase prices.
  - When s increases, firms lower home prices to keep all local customers

Profit comparison with uniform pricing

- *Mobile targeting increases profit from uniform pricing if* $V < (5t - s)/2$
  - Profit under UP is low when V is low
  - When t is high and s is low, price on mobile is higher
  - Fits restaurants and movies
  - "Since demand goes up by 50%, profit goes up as long as price drops less than 33%." – David Soberman

- *Consumers are strictly better off under mobile targeting than under uniform pricing. (more buy, lower price everywhere)*

Extension I: naïve consumers

- When many naïve consumers are unaware of offers outside of their home locations, intra-firm competition is weaker and prices are closer across locations → informed residents travel to the middle to make a purchase in equilibrium

- Profit may decrease with the fraction of informed residents in early stages of MT

- The general intuition that MT could outperform UP for low WTP categories continues to hold

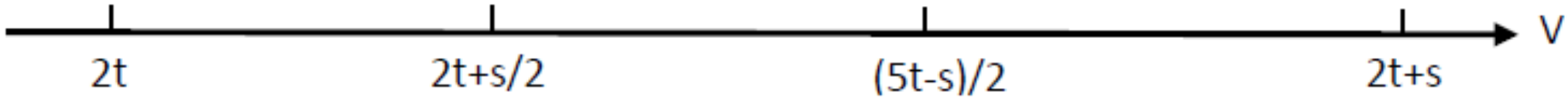
Extension II: consumers travel for external reasons

- Prices at 0 and 1 increase and become higher than the price at the middle location
  - Poaching at distance 1 is too damaging to home-base profit
  - Price lowest at the middle to accommodate travel cost

- Equilibrium profit under MT is weakly higher than under UP
  - If all consumers travel for external reasons, we are back to UP

Extension III: tracing down consumers' base locations

Uniform<Tracing<Mobile Tracing<Uniform<Mobile Tracing<Mobile<Uniform



Note: the third region above (T<M<U) appears only if t<3s.

Summary

- Mobile targeting may increase profitability when compared with coupon targeting and uniform pricing
  - Consumers' real time location is a new dimension to price discriminate
  - Firms benefit from consumers' strategic behavior
  - Firms' incentive to limit intrafirm competition has a positive impact on interfirm competition
- Profitability depends on
  - Fraction of strategic consumers; distribution of consumers across locations; category willingness to pay; consumers' preference strength and transportation costs

Thank you!