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Defending Mail Markets against New Entrants:

An Application of the Defender Model to Postal Markets

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Agenda

- Introduction: The defender model
- Preferences and market shares
- Model assumptions
- Simulation results
- Conclusion

Introduction

The need for postal incumbents to adjust prices due to competitive entry (and still being restricted by Universal Service Obligations) has been studied before, cf. e.g. Cohen et al. (2007):

> "The primary response of incumbents when confronted with significant competition will be to embark on a stringent cost reduction program, establish cost and volume based prices, and compete vigorously for large customers through aggressive negotiated prices"

There is also a vast literature on the interaction between competition and (Universal Service) regulation , cf. e.g. Crew and Kleindorfer (2001, 2007), Dietl et al. (2005), Jaag (2007), Gautier and Paolini (2010)

Contribution of this paper

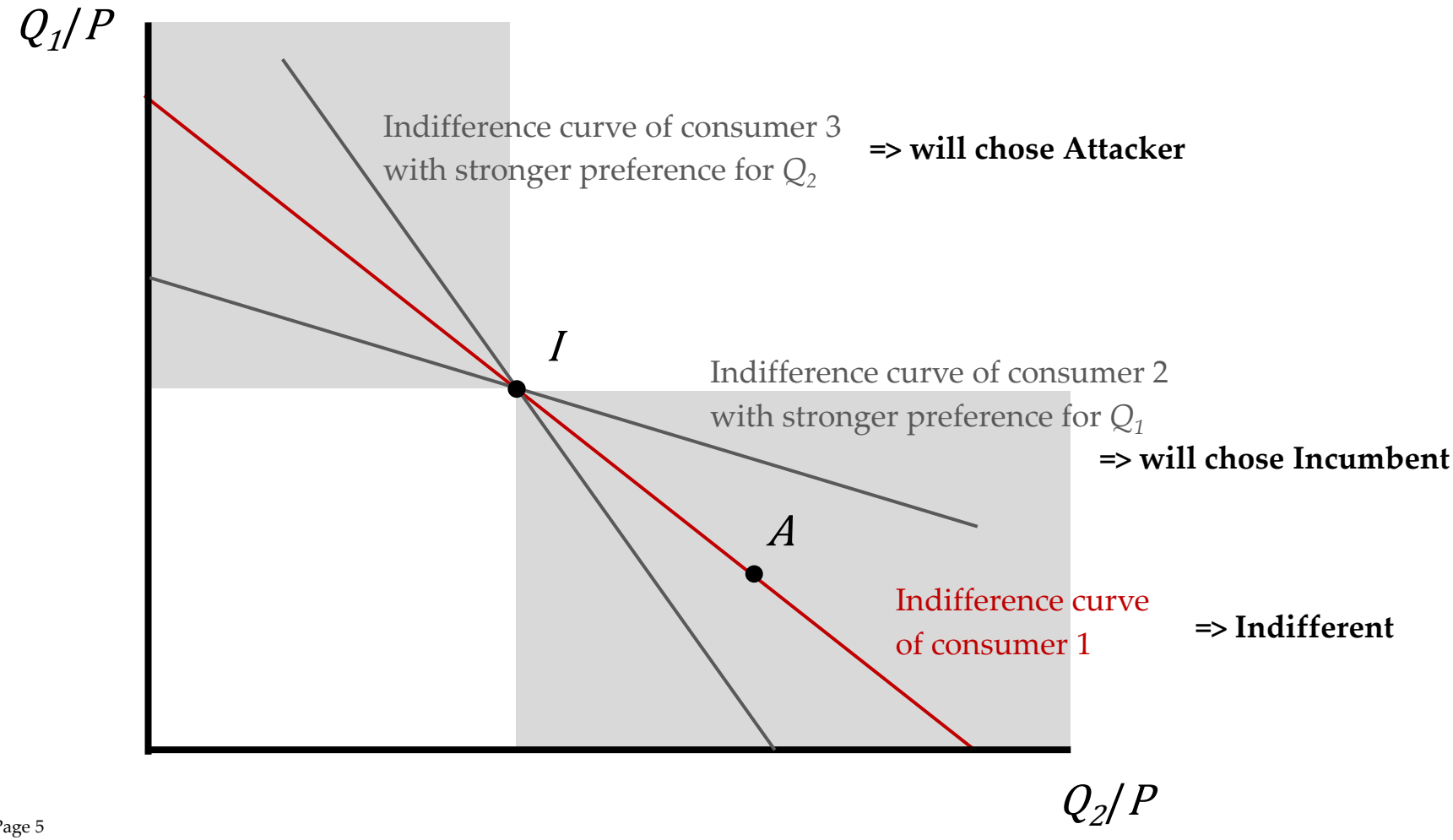
We assess the possibility of a USP to react by adjusting its value proposition accordingly – using the defender model applied in the marketing literature.

The defender model in a nutshell

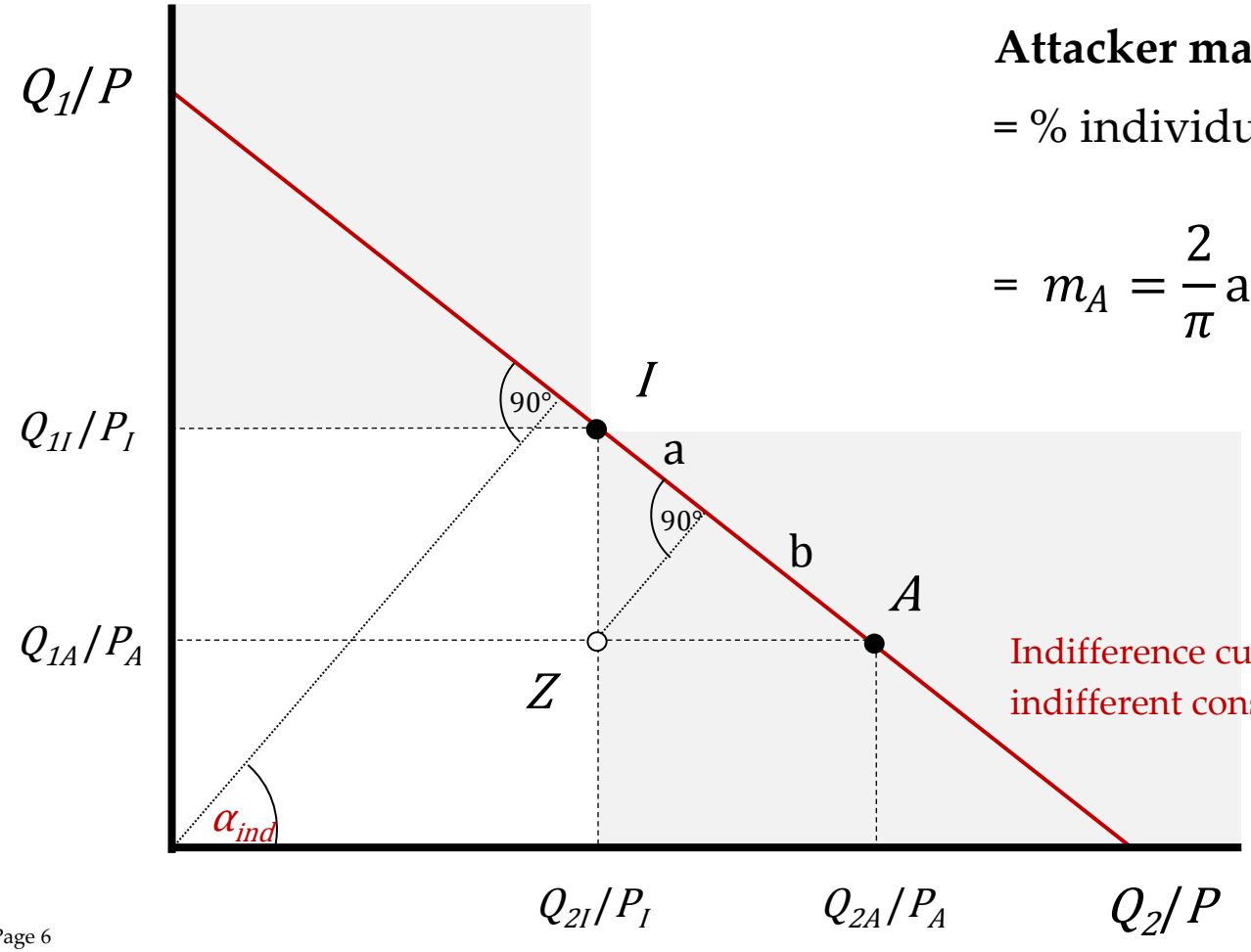
- Pioneered by Hauser and Shugan (1983)
- Standard model: Two quality dimensions (substitutive in nature)
- Several brands
- Heterogeneous consumers
- Competition in price/quality bundles - per-dollar measure of utility
- First application:
  liquid dish washing detergents
  quality attributes: efficacy vs. mildness

→ **Ideal model for postal markets**

Preferences



Market shares



Attacker market share

= % individuals with $\alpha < \alpha_{Ind}$

$$= m_A = \frac{2}{\pi}\arctan\left(\frac{\frac{Q_{2A}}{P_A} - \frac{Q_{2I}}{P_I}}{\frac{Q_{1I}}{P_I} - \frac{Q_{1A}}{P_A}}\right)$$

Indifference curve of indifferent consumer

Model assumptions

Sequence of decisions

Choice variables:

Q_1 **end-to-end speed**

Q_2 **coverage**

P **price**

Operator profit function:

$$\pi = \underbrace{m * N * P}_{\text{revenue}} - \underbrace{F}_{\text{fixed cost}} - \underbrace{f{Q_1}^d}_{C(Q_1)} - \underbrace{m * N * \left(c + g{Q_2}^b\right)}_{C(Q_2,m)}$$

Simulation results I – Optimal quality choice

Regulatory restrictions for incumbent's reaction

Price freeze: $P_I = 2$, Quality floor: $Q_1 \geq 0.8$, $Q_2 \geq 0.4$

	Attack			Optimal Positioning			After Entry				
	Q_{1A}	Q_{2A}	P_A	**Q_{1I}**	**Q_{2I}**	P_I	m_I	NmP_I	TC_I	π_I	$\Delta\pi_I$ (monopoly)
Monopoly	-	-	-	**0.80**	**0.4**	2	1.00	200.00	111.67	88.33	-
Competition	0.5	0.5	1.9	**0.88**	**0.4**	2	0.89	177.39	108.60	68.79	-19.54
Competition	0.4	0.6	1.9	**0.92**	**0.4**	2	0.82	164.74	106.75	57.99	-30.34
Competition	0.2	0.8	1.9	**0.91**	**0.4**	2	0.72	143.33	98.05	45.28	-43.05
Competition	0.1	0.5	1.9	**0.80**	**0.4**	2	0.97	193.60	109.24	84.36	-3.97
Competition	0.7	0.7	1.9	**1.00**	**0.4**	2	0.89	170.00	117.20	52.80	-35.53

- Incumbent's repositioning towards its own strength.
- With a price cap it can be optimal to increase coverage.
- The more intensely the entrant attacks the incumbent's strong attribute, the more intense will also be the incumbent's reaction.
- Q_2 always binding (i.e. causing net costs)

Note: The simulations were carried out using stylized data

Simulation results II – Optimal pricing

Regulatory restrictions for incumbent's reaction

Qualities: $Q_1 = 0.8$, $Q_2 = 0.4$

	Attack			Optimal Positioning			After Entry				
	Q_{1A}	Q_{2A}	P_A	Q_{1I}	Q_{2I}	P_I	m_I	NmP_I	TC_I	π_I	$\Delta\pi_I$ (monopoly)
Monopoly	-	-	-	0.8	0.4	**2.000**	1.00	200.00	111.67	88.33	-
Competition	0.5	0.5	1.9	**0.8**	**0.4**	**1.942**	0.87	169.19	101.89	67.30	-21.03
Competition	0.4	0.6	1.9	**0.8**	**0.4**	**1.913**	0.79	151.37	95.84	55.53	-32.80
Competition	0.2	0.8	1.9	**0.8**	**0.4**	**1.993**	0.64	128.28	84.63	43.65	-44.68
Competition	0.1	0.5	1.9	**0.8**	**0.4**	**3.099**	0.70	217.38	89.02	128.36	40.03
Competition	0.7	0.7	1.9	**0.8**	**0.4**	**1.700**	0.93	158.23	106.42	51.81	-36.52

- Harms of a low-price attack on the variable cost attribute (Q_1) can be dampened both by lowering prices or product differentiation towards one's own strength.
- This depends on the possibility of the incumbent to actually react on the quality margin
- Price responses appear more costly than quality responses (depends on calibration)

Note: The simulations were carried out using stylized data

Conclusion

- Defender models seems to be an interesting framework to assess entry and defending strategies in postal markets.
- Comparing the scenarios with quality repositioning and price adjustment indicates that the former seems to be superior to pricing in terms of minimizing lost profits.

Outlook:

- Work in progress: Simultaneous optimization
- Simulation with real data
- Extension to other definitions of the USO
- Model can be applied to estimate the net cost of variations in the USO

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Thank you.

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