UNIVERSIDADE NOVA DE LISBOA BUSINESS ECONOMICS

Welfare Analysis of Regulating Mobile Termination Rates in the UK (with an Application to the Orange/T-Mobile Merger)

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- Almost everywhere sectoral regulators have imposed a cap on MTRs, often (but not always) equal for FTM and MTM calls - why?

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    - Linear / pre-paid tariffs: high MTRs reduce competitive intensity
    - Two-part / post-paid tariffs: low MTRs reduce competitive intensity
- In practice most MNOs set high MTRs

Economic Effects of High MTRs

- FTM calls:
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  - Inefficiency in fixed market through high FTM prices
- MTM calls:
  - Inefficiency in mobile market through high MTM off-net prices
  - Transfer of surplus from MNOs to subscribers (two-part / post-paid tariffs)
  - Transfer of surplus from subscribers to MNOs (linear /pre-paid tariffs)
  - Transfer of surplus between asymmetric networks

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- EU recommendation of May 2009: MTRs should converge to LRIC, where "increment" is mobile termination as additional service
- Means MTR target in the 1 – 2 Eurocent range

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  - LRIC or LMRC
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- Our paper: Calibrated model of UK mobile and fixed markets in order to disentangle effects and compare options

The Model

- Based on multiple network competition model of Hoernig (2010), CEPR Discussion paper 8060
- 5 or 6 asymmetrically-sized mobile networks competing directly against each other
- Two-part tariffs with on/off-net discrimination
- Call externalities
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- Sorry, no formulas this time (they are in the paper)

Calibration

- Ofcom (2009) information on subscribers, demand
- Calibrated linear demand function
- Real market shares (held constant for short-run effects)
- Own estimate of marginal costs
- Calibration of network differentiation parameter and stability check
- Consider different levels of call externality β

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- Consider different levels of call externality β
- All results are
  - in millions of pound sterling per year
  - in comparison to status quo
- Fixed and mobile markets considered separately and in aggregate

Total Welfare in Mobile and Fixed Markets

Aggregate Change in Welfare

	$\beta = 0$	$\beta = 0.25$	$\beta = 0.5$	$\beta = 0.75$	$\beta = 1$
LRMC	367	648	1023	1537	2272
Recip	366	675	1086	1651	2459
B & K	360	674	1091	1665	2485

- Low call externalities: MTR at cost socially optimal
- High call externalities: MTR **below** cost socially optimal
- Social welfare predicted to increase by between £0.3bn and more than £2bn, depending on the strength of the call externality

Consumer Surplus in Mobile and Fixed Markets

Aggregate Change in Consumer Surplus

	$\beta = 0$	$\beta = 0.25$	$\beta = 0.5$	$\beta = 0.75$	$\beta = 1$
LRMC	29	217	464	800	1276
Recip	-31	174	443	810	1328
B & K	-51	157	429	800	1326

- Low call externalities: MTR below cost reduces CS
- High call externalities: MTR **below** cost increases CS
- Consumer surplus increases less than total welfare
- Implies that networks also gain on aggregate

Fixed Market

- Changes do not depend on call externalities

Change in Fixed Market Values

	Welfare	Consumer Surplus	Profits
LRMC	541	473	68
Recip	676	592	84
B & K	712	623	88

- Welfare in fixed market increases due to lower FTM prices
- Consumer surplus increases due to lower FTM transfers
- Profits increase due to higher FTM quantities
- Both consumers and the fixed network benefit

Welfare in Mobile Market

Change in Mobile Welfare

	$\beta = 0$	$\beta = 0.25$	$\beta = 0.5$	$\beta = 0.75$	$\beta = 1$
LRMC	-174	107	481	996	1731
Recip	-310	-1	410	975	1783
B & K	-352	-38	380	953	1773

- Welfare decreases: reduced transfers from fixed market
- reases: lower off-net prices
- The second effect dominates with medium to high call externalities

Consumer Surplus in Mobile Market

Change in Mobile Consumer Surplus

	$\beta = 0$	$\beta = 0.25$	$\beta = 0.5$	$\beta = 0.75$	$\beta = 1$
LRMC	-444	-256	-9	327	802
Recip	-623	-418	-149	218	736
B & K	-674	-467	-194	177	702

- Mobile CS decreases strongly:
  - Reduced transfers from fixed market (Waterbed effect)
  - Higher fixed fees due to smaller tariff-mediated network effects
- Mobile CS **increases with high call externalities** due to lower off-net prices
- Even mobile consumers may gain from reduced MTRs

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- Orange/T-Mobile predicted cost savings of about £400m
- The European Commission cleared the merger in March 2010
- Our question: How does the merger affect consumers **under different MTR scenarios**?
- Following tables show changes in £m

Merger under 2010/11 MTRs

- Let's for a start keep MTRs where they are

Merger with 2010/11 MTRs

	$\beta = 0$	$\beta = 0.2$	$\beta = 0.4$	$\beta = 0.6$	$\beta = 0.8$	$\beta = 1$
W	24	6	-56	-210	-573	-1,465
CS	-1,821	-1,883	-1,982	-2,142	-2,418	-2,932
π	1,845	1,889	1,926	1,932	1,844	1,467

- Merger increases welfare with low call externalities!

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- Merger increases welfare with low call externalities!
  - Absurd result?
  - No, merger brings many previous off-net calls on-net
  - Increase due to existing distortion through high MTRs
- In any case, consumers suffer and profits increase

Merger under B & K, constant market shares

- Now assume Bill & Keep as the most extreme change
- Keep market shares constant for now

Short-run Effects of Merger under B & K

	$\beta = 0$	$\beta = 0.2$	$\beta = 0.4$	$\beta = 0.6$	$\beta = 0.8$	$\beta = 1$
W	2	2	1	-1	-8	-29
CS	-1,983	-2,065	-2,171	-2,309	-2,491	-2,743
π	1,985	2,067	2,172	2,308	2,483	2,715

- Small welfare effect (similar call prices)
- Similar large reduction in consumer surplus
- Profits increase by same amount

Merger under B & K, symmetric market shares

- Bill & Keep might lead to more similar market shares in the long run
- So let's check symmetric market shares right away

Merger under B & K with Symmetry

	$\beta = 0$	$\beta = 0.2$	$\beta = 0.4$	$\beta = 0.6$	$\beta = 0.8$	$\beta = 1$
W	1	1	1	0	-1	-2
CS	-1,220	-1,270	-1,335	-1,420	-1,533	-1,689
π	1,221	1,271	1,336	1,421	1,533	1,686

- Again, only a small welfare effect
- Consumer surplus reduction is smaller but still large
- Profits continue to increase by same amount

Conclusions

- Ofcom's proposed MTR reductions have multiple effects
  - Fixed market participants gain in welfare and surplus
  - Mobile welfare increases, but mobile consumers may lose due to lower transfers and reduced competitive intensity
  - Mobile consumers may still gain overall due to lower off-net prices if call externalities are important

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- Bill & Keep can be optimal

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- Results do not much differ between Ofcom's proposals
- Bill & Keep can be optimal
- Orange/T-Mobile merger
  - Lower MTRs reduce adverse welfare effects of the merger
  - But consumers lose out anyway (and MNOs gain)

Thank you!