



Optimal Fixed-to-Mobile Interconnection Charges

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Background



- ❑ Regulators increasingly interested in the level of mobile call termination charges
- ❑ Significant difference between termination charges and LRIC taken as indication that regulation might be needed
- ❑ Proposed regulation based on LRIC + EPMU

What are the problems?



- ❑ Call termination is not a stand-alone service, but part of a cluster of services
 - ❑ The question whether 'competition in the supply of call termination is effective' is rather meaningless
 - ❑ LRIC not necessarily a relevant benchmark where there are considerable fixed and common costs
 - ❑ LRIC + EPMU might seriously harm welfare
- ❑ What are socially optimal termination charges?
 - ❑ Is there a problem?
 - ❑ If so, what should be done?

The socially optimal benchmark •econ

- Ramsey prices as the relevant benchmark
 - Minimise distortions from the inevitable need to price services above MC
 - Take account of demand interrelationships
- Calculating Ramsey prices requires good information about demand conditions, but it is possible to give indications of the order of magnitude of socially optimal mark-ups

What are the priors?



- Ramsey prices may be very different from LRIC+EPMU (or FAC) prices in markets where penetration is growing because of superelasticities across services
 - Increase in the price of mobile originated calls and subscriptions has an impact on subscriber numbers
 - This in turn has a knock-on effect on total mobile call volumes as well as fixed-to-mobile call volumes

Approach



- ❑ Looking at the mobile sector as a whole and taking fixed penetration and prices as given
- ❑ Ignore impact of call termination rates on retail competition in the mobile sector
- ❑ Use UK data to estimate demand equations for:
 - ❑ Fixed to mobile minutes
 - ❑ Mobile originated minutes
 - ❑ Mobile 'subscriptions' (which include both pre-paid and post-paid customers)
- ❑ Make assumptions about LRIC/marginal cost
- ❑ Solve numerically for Ramsey prices calibrating the demand model with current prices/volumes
- ❑ Bootstrap Ramsey prices to see what might be consistent with the limited data available

Demand assumptions



- ❑ Mobile subscriptions

f(average bill)

- ❑ Mobile originated calls:

f(number of subscribers, ARPU)

- ❑ Fixed-to-mobile calls

f(number of mobile subscribers, price)

- ❑ Gompertz specification for subscriptions, log linear demand specification for calls

❑ Fixed-to-mobile calls

- ❑ Data from BT on call minutes and headline prices as well as total number of handsets by operators and time (day/evening/week-end) on a monthly basis over 2 years

❑ Mobile users

- ❑ Data from Oftel Market information on mobile subscribers and total expenditure on calls and fixed charges on a quarterly basis

❑ Mobile originated calls

- ❑ Data from Oftel Market Information on mobile originated call minutes on a quarterly basis by operator

Summary statistics for bootstrap parameters



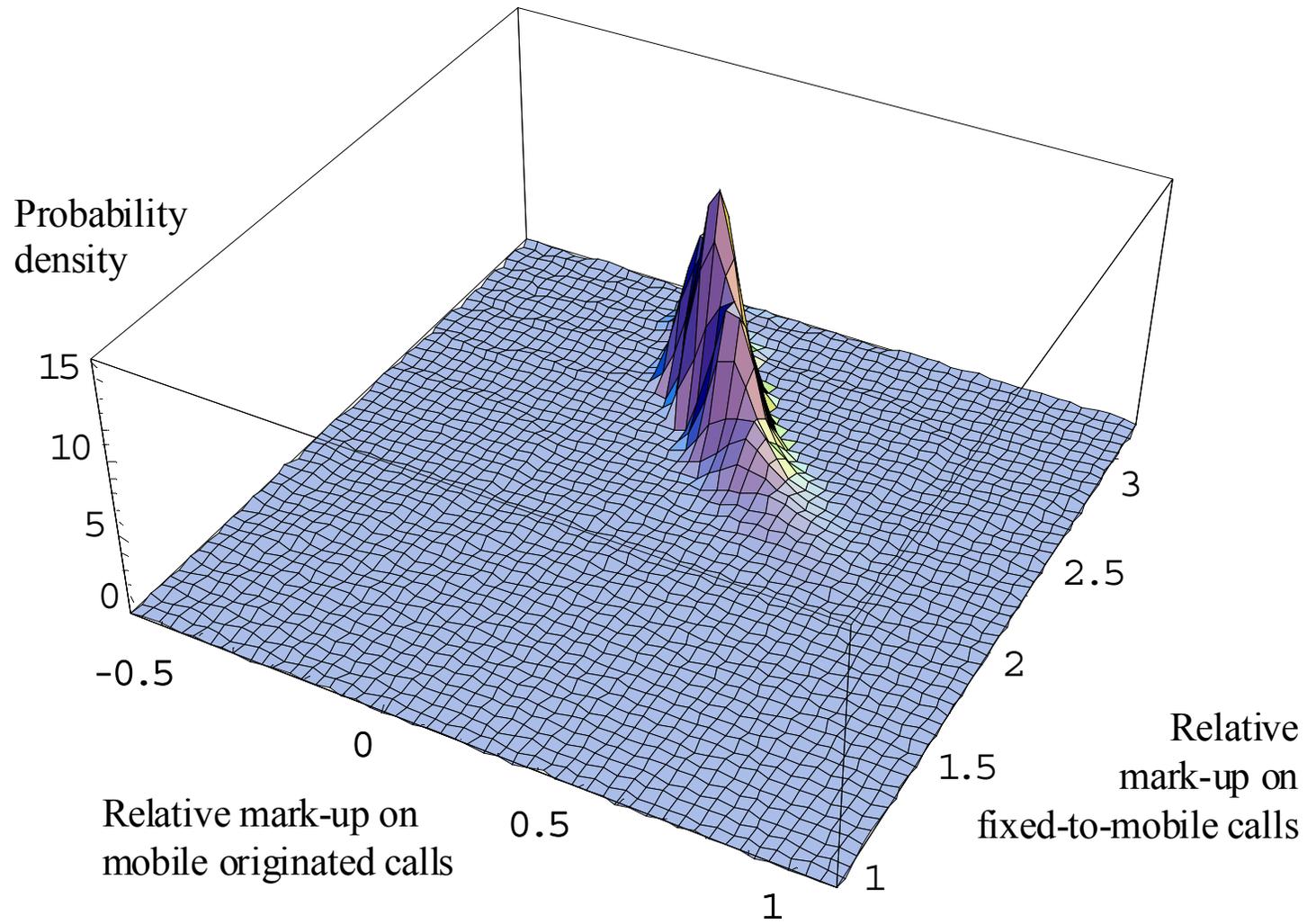
<i>Coefficient</i>	<i>Mean</i>	<i>Median</i>	<i>StdDev</i>	<i>90% Confidence Interval</i>	
<i>Mobile originated calls</i>					
ln(P)+Ln(ALTP)	-0.411	-0.400	0.150	-0.178	-0.668
ln(SUBSCRIBERS)	0.765	0.768	0.059	0.859	0.668
<i>Mobile subscriptions</i>					
ln(BILL)	2.532	2.412	0.744	3.683	1.740
<i>Fixed-to-mobile calls</i>					
Price elasticity	-0.407	-0.409	0.141	-0.170	-0.637
Mobile subscriber number elasticity	0.586	0.583	0.057	0.684	0.497

Results

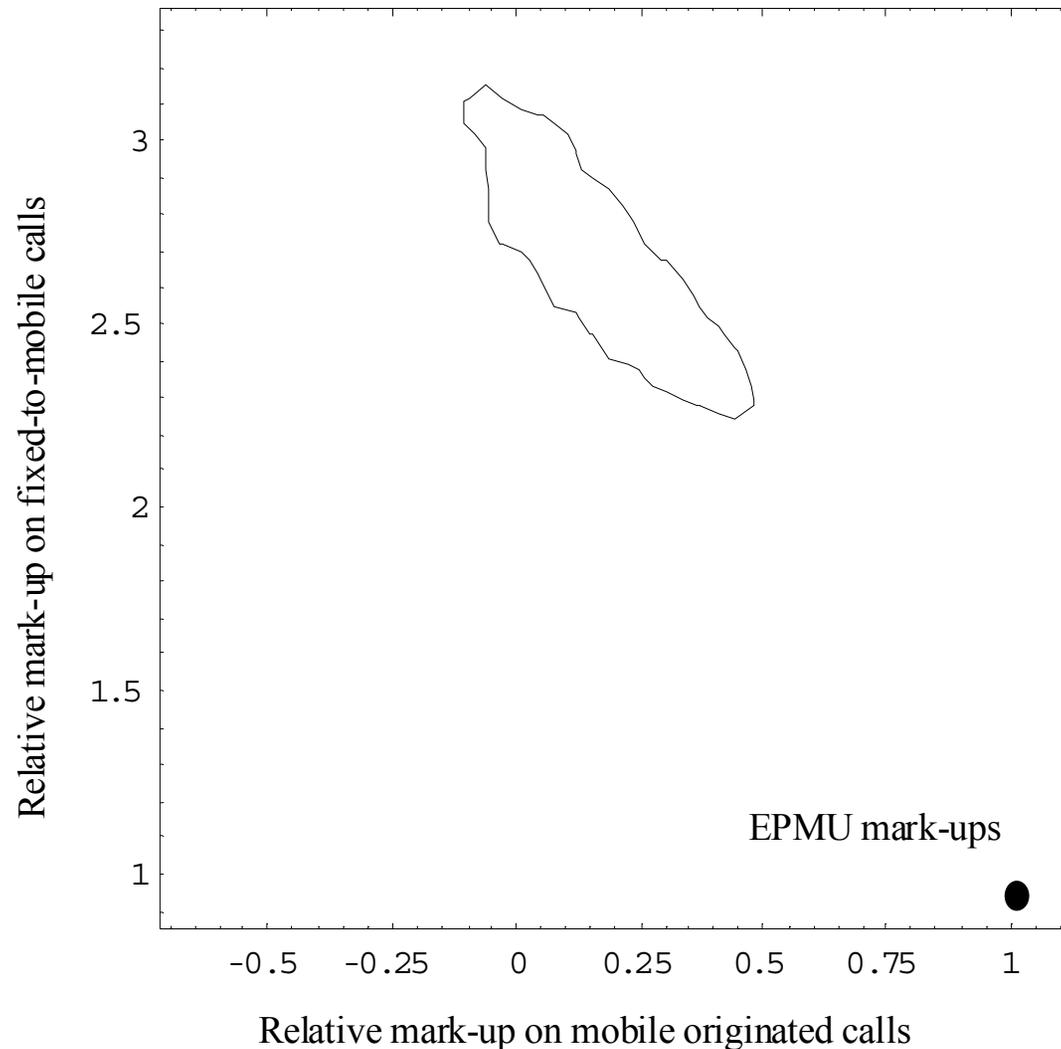


	<i>Mean</i>	<i>Median</i>	<i>StdDev</i>	<i>90% Confidence Interval</i>	
Ramsey Prices					
Subscription	20.232	20.852	4.350	25.247	12.686
Mobile Originated Call	0.068	0.067	0.014	0.085	0.054
Fixed to Mobile call	0.276	0.268	0.065	0.394	0.189
Ramsey Mark-ups					
Subscription	7.9%	11.2%	23.2%	34.6%	32.3%
Mobile Originated Call	48.1%	46.6%	30.5%	83.7%	16.4%
Fixed to Mobile call	689.3%	665%	185.9%	1027.0%	441.1%
Mark-up Differences					
Fixed – Subscription	681.4%	652.0%	207.3%	1058.2%	411.1%
Fixed – Call	641.2%	617.4%	204.0%	1007.6%	362.7%
Call – Subscription	40.2%	37.9%	31.9%	72.8%	17.7%

Ramsey prices are significantly different from EPMU prices



Ramsey prices are significantly different from EPMU prices



Caveats and extensions



- ❑ No call or option externalities considered
 - ❑ Call externalities are relevant for both fixed-to-mobile and mobile originated calls and should be to some extent internalised
 - ❑ Option externalities would indicate a further loading of costs on fixed-to-mobile calls
- ❑ Call-back may limit extent to which prices can diverge (and may act as a further constraint)
- ❑ Not addressed how such prices could be sustained given the interaction between mobile operators
- ❑ Absolute numbers for socially optimal prices may be different – but the general structure should not change