Institution: Imperial College London
Unit of Assessment: 19 Business and management studies
Title of case study: Helping mobile telecom regulators set more appropriate termination rates

1. Summary of the impact (indicative maximum 100 words)

Regulating telecommunications has been difficult for policy-makers, who must balance freedom for business operation with fairness and value for consumers. Termination rates - the cost of ending phone calls using other networks - have been particularly contentious.

Professor Valletti's work helped regulators, including Ofcom, to model the processes involved and thereby improve regulatory pricing guidelines.

By developing a new theory of regulation - how dynamic incentives price regulation - his research has influenced policy in both UK and international telecommunications markets.

2. Underpinning research (indicative maximum 500 words)

Valletti's work, conducted at Imperial College London during 2003-12, analysed the interaction between competition and regulation, in terms of both market and regulatory failures, with particular reference to the telecommunications market. This work has been at the forefront of understanding interconnection issues in telecoms, which have both strategic and normative implications.

Not only does interconnection bring huge benefits from network externalities – by joining a network the benefit to existing members is enhanced - it also induces dependencies between firms that alter the way competition develops. Valletti developed the theory of how wholesale deals (invisible to consumers) affect retail prices, and deduced the consequences for consumer welfare and social surplus. Empirically testing these theories for the first time, he also found evidence of a "waterbed effect": regulation of one price (e.g. termination charges) leads mobile operators to raise *other* prices instead.

The contribution of the underpinning research was three-fold:

- ***A theory of interconnection regulation***. How should such rates be regulated? Can simple (non-intrusive) rules achieve social efficiency? For each operator, interconnection rates are both a cost (for outgoing calls) and a revenue (for incoming calls). Valletti developed models of two-sided markets recognising this dual role, highlighting the impact such wholesale prices have on retail subscription fees and, more generally, on the intensity of competition in the market. This research also derived the conditions under which simple rules, such as reciprocity of interconnection rates, can be used by regulators without the further need to intervene in a more intrusive way [2, 4];
- ***Effect of dynamic incentives*** (e.g., investments in capacity, entry by new operators). This is relevant for the new generation of broadband investment. This research identified two concerns brought about by high interconnection fees. First, they are an entry-deterrence strategy adopted by incumbents when facing potential entry. Second, they provide less incentive to invest in new capacity, since an operator does not want to create costly traffic imbalances (i.e. if it sends out more traffic than in receives) [1, 3];
- ***An empirical assessment of the impact that regulation has on prices*** (the waterbed effect). The waterbed effect is predicted by many theoretical models but had never been tested before with empirical data. This research showed that, as termination rates are increasingly regulated, fixed telephony users benefit.

In their 2003 report *How mobile termination charges shape the dynamics of the telecom sector*, Bomsel, Cave *et al* estimate that the excess of termination charges over costs - just in France,

Germany and the UK - amounted to €19bn from 1998 to 2002 [A, p. 7]. However, as excess termination charges are reduced, competition among mobile operators is relaxed, inducing an increase in mobile subscription fees. Employing a uniquely constructed panel of mobile operators' prices and profit margins across more than twenty countries over six years, Valletti's research showed that a 10% reduction in termination rates causes a 5% increase in mobile fees [5].

3. References to the research (indicative maximum of six references)

The key publications frequently cited in the policy contexts are:

[1] Valletti, T., Cambini, C. 'Investments and network competition', 2005, *RAND Journal of Economics*, Volume 36, n. 2, 446-467, [26, 126]

[2] Valletti, T., Cambini, C. 'Information exchange and competition in communications networks', 2008 *Journal of Industrial Economics*, Volume 56, n. 4, 707-728, [9, 37];

[3] Valletti, T., Calzada, J., 'Network competition and entry deterrence', 2008, *Economic Journal*, vol. 118, issue 531, 1223-1244, [11, 66];

[4] Valletti, T., Houpis, G., 'Mobile termination: What is the "right" charge?', 2005 *Journal of Regulatory Economics*, Volume 28, n. 3, 235-258, [10, 40];

[5] Valletti, T., Genakos, C., 'Testing the "waterbed" effect in mobile telecommunications', 2011, *Journal of the European Economic Association*, vol. 9 issue 6, 1114-1142 [4, 64];

[6] Valletti T., Genakos, C. Regulating prices in two-sided markets: The waterbed experience in mobile telephony', 2012, *Telecommunications Policy* vol. 36 issue 5, 360-368.

Evidence of the excellence of this research

Valletti's research has been published in peer-reviewed journals of high international esteem, many of which are the leading international outlets for research in this field.

4. Details of the impact (indicative maximum 750 words)

Impact with Ofcom

Ofcom is the independent regulator and competition authority for UK communications industries. Valletti was a member of its Panel of Academic Advisors and its Spectrum Advisory Board (2007-11). Decisions have frequently been based on his research.

In its *2011 Statement*, Ofcom decided *to cut mobile termination rates (MTRs),* adding 'the impact of lower MTRs on the level of mobile prices will mostly arise from the potential impact of a decline in MTR payments from fixed communications providers. *'This is in line with the empirical findings of a Genakos and Valletti's recent paper'* [B, point 7.54]. The Chief Executive of Ofcom has attested to the influence of Professor Valletti's research, stating that "the policy implications of the two papers [5 and 6] featured prominently in our final decision on this policy matter' and that his work "deals with relevant (and complex) policy questions…[which are] highly relevant to organisations such as Ofcom where policy making is based on a rigorous assessment of the available evidence" [C].

Can we value the benefit of this impact? According to the 2011 "Communications Market Report: UK" issued by Ofcom UK, the volume of calls to mobile phones was 45bn minutes. The regulator decided to cut the mobile termination rates from 4.18 ppm (rate at 01/04/11) to 0.69 ppm (from 1/04/2014). Therefore, without even considering that lower prices will cause a higher number of calls, this reduction *will cut costs to mobile phones by more than £0.5bn per year, every year.* This is a lower bound to the estimated benefits for UK consumers.

Ofcom made this decision having full regard to the indirect adverse consequences that it was likely to have:

> 'In addition for 'post-pay customers (who, by definition, are willing to pay subscription charges), we consider that the greatest impact will be an increase in subscription charges rather than in usage charges (which should decrease).... *This view is consistent with the empirical evidence in a recent paper in which Genakos and Valletti assessed the effect of reducing MTRs on different tariff structures. They found that, for post-pay customers, there was a strong waterbed effect, and that this mainly came through the fixed component (i.e. the subscription fee) rather than the variable component (i.e. usage charges)*.' [D, points 7.70 & 7.71].

Ofcom also cited Professor Valletti's work in *Wholesale Mobile Voice Call Termination, Preliminary Consultation on Future Regulation, Consultation* (2009) [E]:

> 'There is scarce evidence about the magnitude of the waterbed effect. Recent academic papers have reached mixed conclusions. *Genakos and Valletti (2007)54 looked at whether a reduction in Mobile Call Termination charges by regulation led to an increase in retail prices, and found that the waterbed effect is large, but not complete*'....*Consequently 'given the lack of conclusive evidence, Ofcom decided not to rely heavily on any assumption of an incomplete waterbed effect.'* [E, Points 5.12 & 5.13, 2009].

A similarly worded paragraph also appears in *Wholesale Mobile Voice Call Termination, Market Review Volume 2 – Main consultation* [F, point 5.29].

This work is also cited in the Ofcom report *Mobile Call Termination, Annex 6, Relevant Empirical Studies, 'Genakos and Valletti test whether the waterbed effect in mobiles exists and, if so, its significance. They consider whether the introduction of regulation on fixed-to-mobile termination charges has affected the structure of prices but not the overall profitability of mobile operators*.' [G, point 20, May 2009]

Impact at the Competition Appeals Tribunal

Valletti was a witness during a BT appeal against Ofcom regarding Termination Charges, held on 14 April 2011, where his research was used extensively, and decisively, during the case. Describing him as *'an expert economist'*, the final judgement report confirmed that '*Dr Valetti [sic] – as the author of the only detailed study of the waterbed, was clearly best placed to comment on the likely size of the Mobile Tariff Package Effect.... As an expert, he was very properly identifying for us the limits of expert knowledge in this area'*. The report concluded that '*basing ourselves mainly on the evidence of Professor Valletti, we find that the waterbed effect in the present case would be significant, but otherwise impossible to quantify'* [H, Points 363-364].

Valletti also submitted evidence and acted as a witness to a second appeal in October 2011. The case is ongoing at present so no public documents / transcripts are currently available.

Membership and Advice

Valletti's work on regulation of interconnection rates and long-run 'bill and keep' system is cited extensively in UK and EU documents. He is a member of the UK Competition Commission Academic Panel who 'act in an advisory capacity to staff. These individuals have been invited to sit on the panel because of their particular experience and research in the area' [I]. His expertise has been recognised by his appointment in October 2013 to the European Commission's Economic Advisory Group on Competition Policy.

He has also acted as an expert advisor to the EU Commission on the definition of remedies for potential market failures in mobile markets (2004), and redefining the list of relevant markets potentially subject to ex ante regulation (2006).

5. Sources to corroborate the impact (indicative maximum of 10 references)

[A] Bomsel, Cave et al 'How mobile termination charges shape the dynamics of the telecom sector';

[B] Ofcom 2011 Statement on Wholesale mobile voice call termination;

[C] Letter from the Chief Executive, Ofcom, 1 March 2012;

[D] Ofcom 2011 'Communications Market Report: UK':

[E] Ofcom (2009), 'Wholesale mobile voice call termination, Preliminary consultation on future regulation';

[F] Ofcom (2010), Wholesale mobile voice call termination Market Review Volume 2 – Main consultation';

[G] Ofcom (May 2009), 'Mobile call termination, Annex 6, Relevant Empirical Studies';

[H] Competition Appeals Tribunal, April 2011;

[I] Membership of UK Competition Commission academic panel (archived link available here).