

Statement of Professor Martin Cave

I have been invited by Avantel to make some observations concerning a section of a paper published by the CRC entitled REVISIÓN Y ACTUALIZACIÓN DE CONDICIONES PARA EL ROAMING AUTOMÁTICO NACIONAL. My brief curriculum vitae is attached. I rely in writing this report on information placed at my disposal by Avantel.

My comments have been invited on a passage at pp. 81-86 entitled ‘7.2. Escalera de la inversion,’ which considers the implications for the matter under discussion in the document of a hypothesis concerning the transition from service to infrastructure competition in fixed networks, entitled the ‘ladder of investment’. This hypothesis is associated with my name because I have popularised it in a number of publications¹. It was widely adopted within the European Union in the last decade.

In brief, in my current understanding, the ladder of investment can be interpreted in either of two ways. The first is as a description of how entry is as a matter of practice effected in fixed networks. Such networks are characterised by very substantial capital costs of constructing a local access network. Those fixed costs are also sunk, in the sense that, if the investment fails, the costs cannot be retrieved. And the costs are ‘lumpy’ in the sense that, in a local area a substantial investment has to be

¹ ‘The ladder of investment in Europe: retrospect and prospect’, *Telecommunications Policy*, 2014, vol 38 (8-9) pp. 674-683. ‘Snakes and ladders: unbundling in a next generation world’ *Telecommunications Policy*, 2010 pp 81-6. “Encouraging infrastructure competition via the ladder of investment”, *Telecommunications Policy*, April 2006, pp 223-237.

undertaken before the access network can be deployed. These factors render the duplication of an incumbent's fixed network a risky and expensive investment.

In these circumstances, it is likely that an entrant will prefer to limit its risks by entering the market by combining some of its own self-supplied activities with the use of assets provided by an existing firm – the fixed incumbent. For example, the entrant may begin by reselling the incumbent's product, then it will add some more of its own assets, choosing initially those which are more easily replicable (such as a core network). And so on until it has replicated all the assets required except, probably, the local loop.

In the second interpretation, the ladder of investment can be invoked expressly as a regulatory policy. Thus a regulator persuaded that end users are better served by infrastructure than by service competition can direct its network access policies (the number of incumbent's assets to which access by entrants is mandated and the price at which such access is available) to the goal of encouraging entrants to make further investments in fixed infrastructure as they acquire more retail customers.

In the era of fixed networks based on copper (in Europe up to about 2010), competition conformed roughly to the pattern described above, as a result of a combination of regulatory policy and firms' strategy. Thus access based competition by 2010 had largely taken the form of leasing the incumbents' local loops – the entrant performing all the other functions.

The subsequent challenge of encouraging investment in fibre networks, capable of providing data transmission at higher speeds, introduced a major new aspect into fixed access regulation: the need to provide incentives for both the historic monopolist and other firms to build expensive new networks. After a period of mixed policies in Europe, the focus is moving increasingly towards encouraging firms in more densely populated areas to compete by constructing of their own fibre networks going right to the customers' premises, using where necessary the passive assets, particularly the ducts and poles, of the historic monopolist (or of another organisation). In more sparsely populated areas, either more comprehensive access products are made available or competing firms may invest jointly (co-invest) in a fibre network.

I note that the CRC invokes the ladder of investment in its discussion of roaming arrangements for the mobile sector. It does so in a context in which it remarks that mobile services fall in life cycle terms into two categories – voice and SMS, which are in a stage of maturity and decline, and mobile internet, which is in a marked growth stage. It also suggests that there is an analogy between investment in 4G mobile networks and in fixed fibre or NGA networks. It then goes on to apply the 'ladder of investment' notion to the situation, in order to draw conclusions concerning roaming prices.

However, there are significant differences between fixed and mobile networks in cost structure. As noted above, a fixed local access network is highly capital intensive; most of the investment is sunk; and a local area has to be fully invested before revenue comes in. On the other hand, a radio access network is less capital intensive; probably contains a lower

proportion of sunk investment; and is scalable, by adding base stations as traffic increases.

Thus barriers to entry are fewer, and there is less need of an express and complex policy to promote infrastructure competition, such the ladder of investment. The dominant (and effective) policy instruments to influence market structure are control of mergers (to prevent lessening of competition by acquisition or combination) and purposive use of spectrum policy via new awards, including spectrum caps in auctions.

In these circumstances it may be more fruitful to consider the issue of roaming within the context of competition policy rather than in the context of a regulatory policy which was developed for another set of circumstances.

In a fully competitive mobile market, firms would be prepared to consider making commercial arrangements to meet the demands of both wholesale and retail customers. Indeed, competitive prices at both the wholesale and the retail level will best promote end user welfare. This outcome is illustrated by the numerous agreements in other jurisdictions between mobile network operators (MNOs) and mobile virtual network operators (MVNOs), which may be taken as a partial indicator of the degree of competition in the market.

The reverse is illustrated in jurisdictions where MNOs engage in tacit collusion in order to raise retail prices, either by offering wholesale prices which are excessive or prohibitive or by refusing in a tacitly co-ordinated way to make any such wholesale offering.

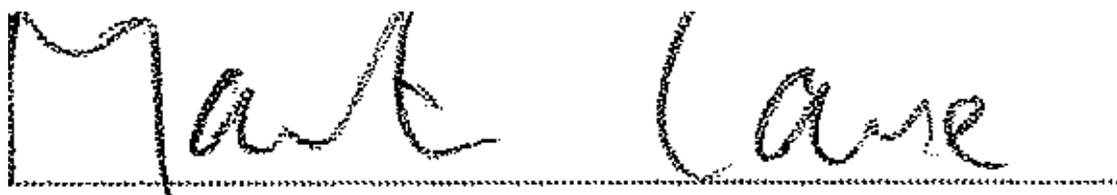
I have not made a study of the degree of competition in the Colombian mobile market. But clearly any departure from an effectively competitive

wholesale market places at particular risk an existing specialist operator like Avantel, seeking a market niche, and requires regulatory intervention in respect of roaming arrangements.

I have also been asked to comment upon the CRC's pricing proposals. My view follows from my remark above that I consider that a policy to promote further infrastructure competition requires careful justification: the analogy with the complex process in Europe of eliciting second and subsequent fixed networks is not strong enough to furnish a reliable basis for action.

On this reasoning, I cannot see much merit, either generally or in the particular circumstances of Colombia, in using high access prices as a means of encouraging more infrastructure investment in the mobile sector.

I note that the end state of the CRC's proposal for voice roaming is a price based on incremental cost - LRIC, and I can see a long term justification for such a pricing approach. But given my conclusion above that the case for using access prices to promote more infrastructure investment is not strong, it may be appropriate to move immediately to incremental cost - LRIC pricing for both voice and data roaming.

A handwritten signature in black ink that reads "Mark Cave". The signature is written in a cursive style and is positioned above a horizontal dotted line.

1 February 2017

