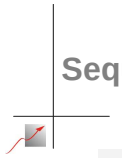
Mobile challengers event
Barcelona – 14 February 2007
TERA Consultants statement

THE VALUE OF BEING FIRST IS A PROMINENT CONCEPT IN ALMOST ALL AREAS OF LIFE,

…, especially when considering an environment where agents are competitive and resources are scarce. In economics, this drive to be first and the understanding of the consequences of entry delays on market dynamics has started to be investigated back in 1934 and for many different good and services.

But strangely enough, very little attention has been devoted by economists to the mobile market until fairly recently, even though they all feature a sequential market entry for 2G networks.



Sequential entry in European 2G mobile markets

	Early entrants	Numeric licence	Entry	Later entrants	Numeric licence	Entry
Austria	Mobilkom	1994	1994	One	1997	1998
	T-Mobile	1996	1996	Tele.ring	1999	2000
Belgium	Proximus	1994	1994	Base	1998	1999
	Mobistar	1995	1996			
Denmark	TDC	1991	1992	Telia	1997	1997
	Sonofon	1991	1992			
Finland	Radiolinja	1990	1991	DNA	1996	1996
	Sonera	1990	1992			
France	Orange	1991	1992	Bouygues	1994	1996
	SFR	1991	1992			
Germany	T-Mobile	1990	1992	E-Plus	1993	1994
	Vodafone	1990	1992	O2	1997	1998
Greece	Vodafone	1992	1993	Cosmote	1995	1998
	STET Hellas	1992	1993	Q-Telecom	2001	2002
Ireland	Vodafone	1993	1993	Meteor	2000	2001
	O2	1996	1997			
Italy	TIM	1994	1995	Wind	1998	1999
	Vodafone	1994	1995			
Netherlands	KPN Mobile	1994	1994	Telfort	1998	1998
	Vodafone	1995	1995	T-Mobile	1998	1999
				Orange	1998	1999
Portugal	Vodafone	1991	1992	Optimus	1997	1998
	TMN	1992	1992			
Spain	Vodafone	1994	1995	Amena	1998	1999
	Telefonica	1995	1995			
United Kingdom	Vodafone	1992	1992	T-Mobile	1993	1993
	O2	1992	1993	Orange	1994	1994

Let me give you only a few examples of recent work on first mover advantage in mobile industries:

- In their study for the Swiss regulatory authority, comparing the development of the Swiss telecommunications market with the rest of Europe, the WIK institute stated that a sequential award of mobile licences can have a negative impact on competition dynamics, because late entrants had disadvantages compared to early entrants
- A study published in 2005 about the early mover advantages in European mobile market by the Tinbergen institute concluded stating that “Depending on the specific conditions of entry, it seems fair to conclude that the first entrant may still gain a large market share, but that subsequent entrants have much more difficulties gaining market share”

- Another study presented by Nakil Sung at the 16th European Regional Conference in 2005, based on 94 mobile operators in 27 OECD countries, found that “a one year increase in the age of an operator leads to an increase of 0,9% (0,7%) in the market share (EBITDA margin), respectively (…).” … and added that “regulators should pay attention to preventing the incumbent’s market power in 2G markets to transferring into 3G markets”

Maybe part of the explanation for this fairly recent interest is that the decision for market entry has not been decided by individual firms but by the Government, and as long as enough candidates where bidding for new mobile licences, why bother…

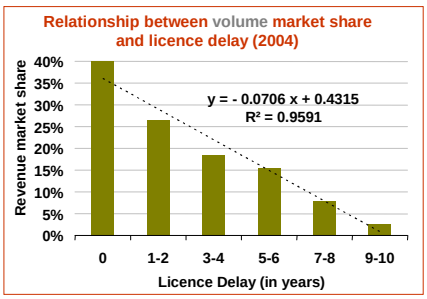
As the name suggests, the economic theory of first mover advantage predicts that a firm who is first to move into a new market, particularly in industries that are subject to network effects, will accrue advantages such that barriers for later entrants become very high, and perhaps even insurmountable. In general, these advantages stems from early adoption by users which allows a firm to capture a large percentage of market share early on. Thus, by the time competitors are able to enter the market, the first mover will, ideally, have already established advantages in brand-loyalty or recognition as well as cost advantages of existing and infrastructure systems

SO LET’S TALK ABOUT FACTS AND HAVE A CLOSER LOOK AT THE MOBILE MARKETS IN EU15 COUNTRIES AND INVESTIGATE IF THERE IS A VALUE IN BEING FIRST

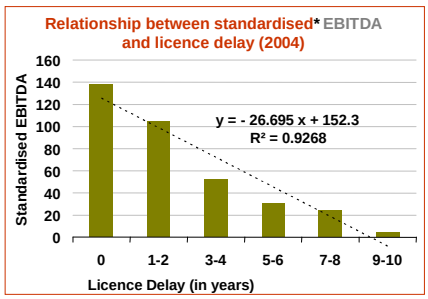
We have collected data on market shares and on EBITDA for 45 operators in EU15 Countries (NB: but Sweden et Luxembourg).

And the results are striking:

An empirical study assessing 45 operators of the EU15 confirms that performances are totally correlated with entry delay



1-year increase in licence delay
⇩
3% decrease in volume market share in 2004



1-year increase in licence delay
⇩
13% decrease in EBITDA in 2004

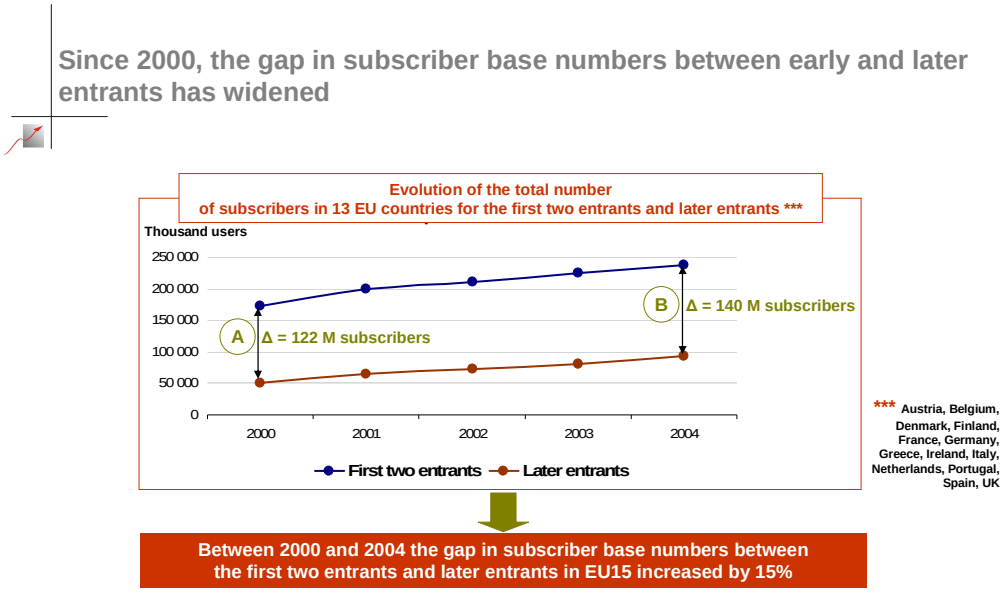
* Standardised EBITDA = EBITDA divided by average EBITDA of all operators in the country

NB: All EU15 countries are considered, except Sweden and Luxembourg

- **1-year increase in licence delay : 3.0-point decrease in revenue market share in 2004**

- **1-year increase in licence delay : 13,3-point decrease in EBITDA in 2004**

Moreover, instead of closing, **the gap in subscribers between early and later entrants has widened since 2000**, with an overall increase by 15% between 2000 and 2004



NB: A per-country analysis gives similar results

If we would take a closer look at individual markets or individual operators, we would find out additional evidence that sequential entry is a key explanation factor for market dynamics in European mobile:

- **The performance of subsidiaries of Pan-European operators is not above average (compared to all other later entrants) when they are Number 3 or Number 4 :** Orange has sold its subsidiary in Denmark to Telia in 2004, it has 13% market share in the Netherlands (small equilibrium), T Mobile has 14% market share in the Netherlands (small equilibrium), etc.
- **Since 2001 (6 years after the last entrant in 2G has entered the market), all 4 mobile operators have had more the 20% market share (threshold above which operators were deemed to be "firmly established").** This is largely due to specific measures taken by the National Regulatory Authority to create a level playing field between earlier and later entrants: ban on direct distribution channel, site sharing, monitoring of on net tariffs since 1998, etc.
- **The only exception of a 3rd entrant becoming market leader in EU15 is Comote in Greece,** which has obviously benefited from synergies with its parent company: in terms of brand awareness ("Cosm – OTE"), in terms of distribution channels, in terms of site sharing, etc.

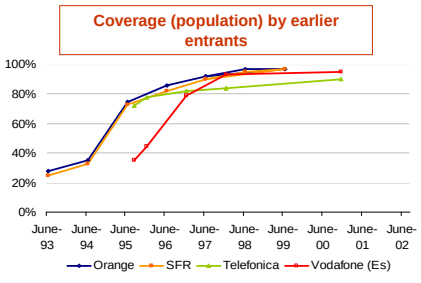
As you may know or fear: economists are very keen on developing "models" so as to understand the economic rationale of market dynamics. So let me very briefly show you, what such a model can learn to us, namely the mechanics that have explain the value of being first in a mobile market. For those who would like to have more details on our work, I invite you to have a look at a forthcoming issue of Telecommunications Policy, as we have submitted our work for publication, or to leave me your visit card so that I can email it to you.

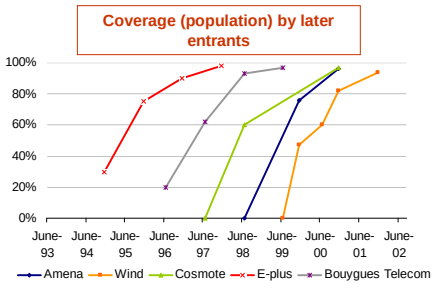
The following model assesses the impact of entry delay on a firm

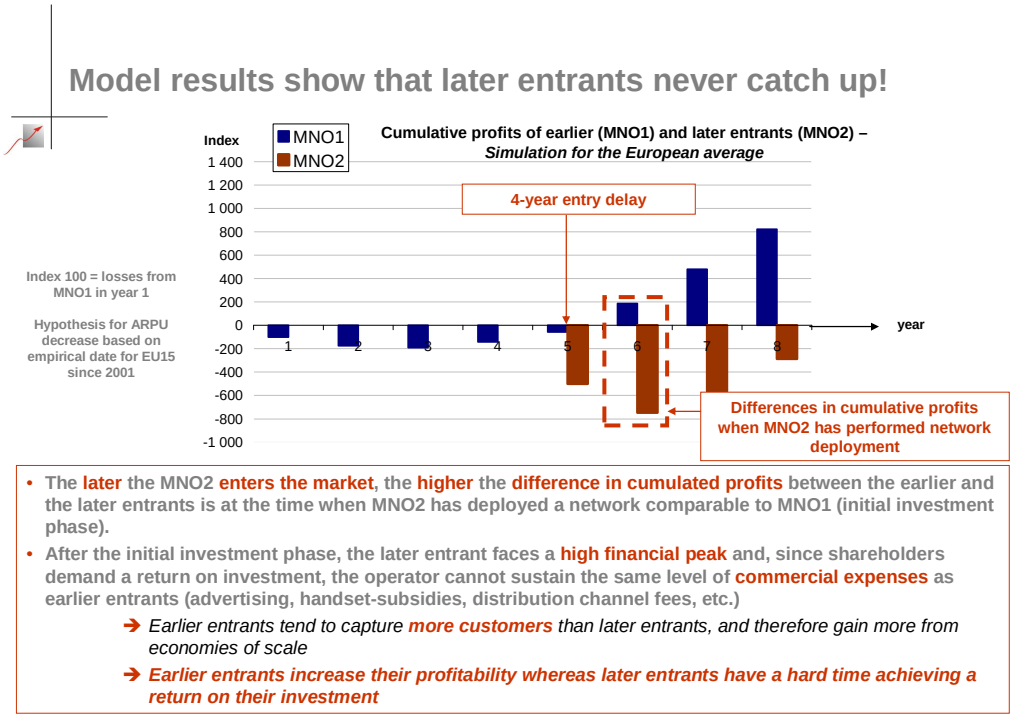
- **Hypothesis: 2 groups of firms enter a market at different times. This market is characterized by high fixed costs and fast growing demand:**
  - *Group 1 enters first at **T0***
  - *Group 2 is obliged to enter at **T+n (n>2)** and Group 1 knows this*
- **Behaviour of earlier entrants (1 or 2 firms in Group 1):**
  - *The subsequent entry of rival firms is a fact and can be anticipated, investments are spread over **n years***
  - *In the initial phase, prices are fairly high and decrease slowly over time: the market expands progressively towards lower-end customers with less propensity to pay*
  - *Slow market development (supply and demand) reduces financing needs (fixed and variable costs) but reduces growth (potential loss of consumer welfare if 'cosy duopoly' when 2 firms enter the market simultaneously)*
- **Behaviour of later entrants (1, 2 or even 3 firms in Group 2):**
  - *In order to be competitive (coverage), firms need to invest roughly the same as Group 1 but in a shorter time frame (**y years, with y<n**)*
  - *Firms need strong sales from day 1, so that prices will go down (the more so as Group 2 does not have established brand awareness and relies on standardized technology, their prices will therefore be below Group 1 prices)*
  - *Group 2 therefore stimulates price competition as well as market expansion*

Running the model on European 2G mobile markets

- **In numerous EU15 markets, Group 1 is comprised of 1 or 2 firms (amongst them the subsidiary of the incumbent telecommunications operator which already holds a 1G license)**
- **On average, the 3rd firm (Group 2) enters 4 years after the first 2 firms (Group 1) ➔ n= 4**
- **Group 2 deploys its network quicker than Group 1: y = 2**







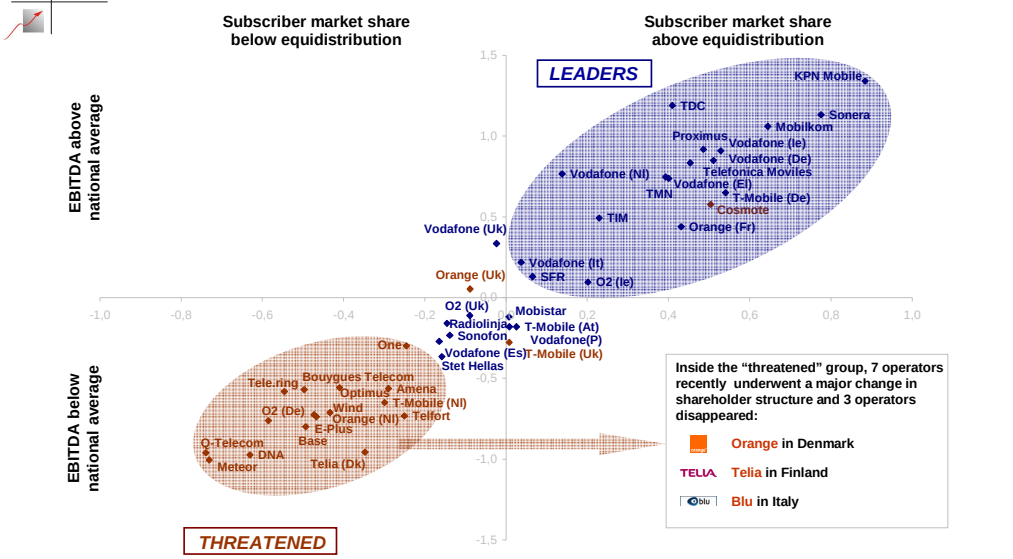
So there is in deed some value in being first, and unless there has been a dedicated regulatory intervention,

THE CONSEQUENCE IS A HUGE GAP IN MARKET POWER BETWEEN EARLIER ENTRANTS AND LATER ENTRANTS

- Let us consider on the horizontal axis how each mobile operator compares to equidistribution. On a market with homogenous goods (similar technology, coverage and quality of service), there are few differentiating factors available, and therefore market shares in volume should converge toward equidistribution, that is to say 100% / Number of mobile operators active on the market. So, if we have 4 operators in the market, the equidistribution is 25%, and it is interesting to note that the threshold of 20% mentioned for the UK mobile market amounts to 80% of the equidistribution. By applying the same rule of thumb, the corresponding value with 3 operators in the market would be 80% of 33%, that is to say 26,5% approximately.
- Let us consider in the vertical axis how the EBITDA per User of each operator compares to the national average. A positioning above or below market average indicates whether it has been more or less costly for the given mobile operator to acquire its customer base.

We observe that later entrants remain structurally week compared to earlier entrants. In most European countries, they cannot be deemed “firmly established”!

Later entrants remain structurally weak



Source: OMSYC (2004)

This calls for specific regulatory attention, provided the expected benefits for the economy and for the consumers of facility-based competition**. It is a shame that the investment ladder approach has not been available in the regulatory toolbox for the mobile market some ten years ago, but we can notice that many of its rungs have been identified (site sharing, roaming obligations, asymmetric interconnection rates, monitoring of on net off net differentiation, mobile number portability, etc.), so why not bring them NOW together into a mobile investment ladder approach.**