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A study of MVNO diffusion and market structure in the EU, US, Hong Kong, and Singapore

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Abstract

Mobile virtual network operators (MVNO's) are emerging as alternative channels for network operators to increase market share and drive traffic over their networks. MVNO's have gained popularity recently in Europe, but have a dismal track record in Asia. In comparing the two regions, this study analyzes how the MVNO market has changed and what opportunities and/or threats network operators and potential MVNO entrants are likely to face. The essential question in next generation MVNO's is how the roles of mobile network operators, service providers and content producers will change current and future value chains. This study conducts an economic assessment of market structure and environment for different countries' MVNO diffusion. The data on market structure is analyzed by means of factor analysis techniques in order to group countries according to their market environments. Then, structural equation modeling is used to investigate the relations of MVNO diffusion and independent variables. The results show that the MVNO diffusion significantly relates to market and industry structure.
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1. Introduction

When SK Telecom, Korea's biggest mobile operator with over 18 million subscribers, established a joint venture in 2004 with Earthlink (ISP provider in the US) to provide the MVNO service (broadband wireless service) in US, several questions were raised. One might wonder why SK Telecom sought MVNO business in the US and not in Asia. This particular question is very compelling because Korea has a well-established infrastructure and dynamics that support ICT development. In addition Korea has a rapid diffusion rate and a high service penetration rate. The simple answer for this question relates recent failures of MVNO's in Asian countries, such as Singapore, Hong Kong, and Malaysia. In Asia, the MVNO market development is not as visible as in Europe. SK Telecom appears to be well aware of the failures of other network operators and is instead seeking ''greener pastures'' in North America where many MVNO's have been successful. This

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example clearly brings forth the scope of this analysis: the determination of where emerging MVNO's will play the biggest role and be the most profitable.

In a similar vein, when Virgin mobile retreated from its Singapore operations in early 2003, the company cited "weak economic and market conditions" in the country as the reason behind the failure of the business (Communications Today, 2002). The failure left some questions as to what market conditions MVNOs would be able to succeed. A cross-national study could shed light on the question as to whether the observable differences are the outcome of a specific set of factors. This research investigates the set of factors influencing MVNO diffusion in order to answer following questions:

- Under what market condition do MVNO's succeed or fail?
- What are the factors affecting the diffusion of MVNO's in the world markets?
- What are the future MVNO business models in next generation networks?

In this research, we analyze four cases for the purposes of answering these questions: two cases for the West (European Union and the US) and two for the East (Hong Kong and Singapore). After collecting data on market and industry, cluster and factor analysis are used to summarize patterns of market structure in the telecommunications industry for these cases. Each factor is characterized by a set of coefficients (factor loadings) expressing its correlations with the observed variables. The variables are assigned to the factor in which they are most loaded. As a result, the market structure indicators are split into disjoint sets with each indicator associated with a single factor. The estimated factor loadings applied to the country-specific market structure indicators make it possible to score countries according to each of the factors, so that rankings of countries can be obtained in terms of factor-specific scores. It is standard practice to retain a number of the factors which cumulatively explain a substantial part of the overall covariance. A multivariate regression model is developed to evaluate the effects of market variables on MVNO diffusion.

The findings of this study reveals that the MVNO diffusion significantly relates to market maturity and industry structure (horizontal or vertical integration). In Asia, mobile operators have predominantly maintained high vertical market integration strategies where they control or own the spectrum, base stations, connecting networks, systems infrastructure, customer service operations, pricing, packaging, billing, branding and points of sale. In contrast, European and US, mobile service is becoming a commodity and network operators are more open to outsourcing parts of the value chain. Operators in these regions increasingly view MVNOs as efficient indirect sales channels that can decrease the focus on price because of fierce brand loyalty, lower subscriber acquisition costs by tapping existing customer bases and increase average revenue per user via differentiated content and services.

This paper is organized as follows: the definition of an MVNO is first briefly introduced followed by a description of how one evolves. The next section reviews previous research on MVNO's. MVNO and their position in the value chain model is discussed in Section 4. Section 5 details the model and data employed in the paper, Section 6 explains the main findings from the regression model and the factor analyses. Vertical/horizontal market structures and implications for MVNO's are discussed in Section 7. The final section details prospects for MVNO's with respect to networks of the future.

2. Definition and evolution of MVNO's

Since its origination in 2000 in Europe, the concept of an MVNO has varied. Regulatory bodies around the world have adopted various definitions and different forms of regulatory intervention depending on the extent to which an MVNO relies on the facilities of a mobile network operator.

The ITU (2001) defined an MVNO as a carrier providing users with mobile services without its own government-issued license for bandwidth. UK's Ofcom (2004) defined it as "an organization providing customers with mobile phone services without owning any airtime". Specifically, OVUM (2000) defined an MVNO as a carrier with the following characteristics: provides customers with a mobile service, has an independent mobile network code (business registration number recorded on the SIM card), issues independent SIM cards, directly operates a mobile communications switch including a home location register and does not own its own bandwidth.