

***Mobile broadband towards an all-mobile environment: assessing the effects spectrum-bands distribution and management on service penetration***

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Widespread broadband access holds the promise of transforming the way in which people work, learn, communicate, learn and interact among the Knowledge and Information Society. A growing body of research recognizes that availability of broadband connectivity is a critical enabler for economic growth, social inclusion, and even more for sustainable development of countries.

While in the past two decades fixed broadband has been the primary approach for access to high-speed data, in recent years mobile broadband has grown exponentially around the world not only for its capacity to provide mobility and new services but for its flexibility to expand coverage at a lower cost and time (Robles Feijóo ) compared to fixed wireline networks. Additionally, stimulating broadband penetration appears to be a main goal on policy-maker's agenda around the world.

In 2008, the number of global mobile broadband users overtook the fixed broadband service. By 2011 mobile broadband had doubled the number of fixed broadband connections. Since then the growth of both, users and mobile traffic, has been exceptional. At the end of 2015 there were 3,500 million users (six times the number of fixed users) and is expected to double this number by 2019. Meanwhile, the mobile data consumption increased tenfold in the past five years from 237 petabytes per month in 2010 to 2,500 petabytes per month in 2015. This trend is expected to continue and by 2019 it is projected to reach 24,300 petabytes monthly due to higher bitrates services, advanced performance devices, as well as the emergence of the "Internet of Things".

This growth is significantly increasing the demand of radioelectric spectrum, turning its management and distribution in a major challenge for spectrum regulators and policy makers. As such, in recent years, international agencies and national governments have sought to identify, reorganize and make available different spectrum bands for mobile services that results suitable for different needs, depending on zones or markets characteristics.

Considering the benefits of the widespread broadband access, clearly identifying the factors that foster or set back mobile broadband penetration across countries constitutes a major challenge among academics, policy makers and regulators.

Although there are several cross-national studies that examine the effects of economic, social, technological and political factors in broadband penetration by empirical methods, such studies traditionally have been focused on fixed service. Literature addressing the mobile broadband service is still limited and, few of the studies, include the role of spectrum availability and diversity in the growth of the service.

This study aims to assess the effects of using and exploiting different frequency bands on mobile broadband penetration across countries. It is expected to find evidence that distribution of different bands between operators of a country has an impact on the penetration of mobile broadband.

The research will follow a multivariate regression approach. In order to identify whether the availability and diversity of spectrum has an effect on the penetration of mobile broadband, the methodology of multivariable regression (multivariate regression analysis) applied to cross section (which is used by many previous studies to identify factors of adoption broadband), will be followed considering economic, social, technological and regulatory factors with data from 122 countries.

The results will allow to provide some guidelines to establish regulatory and policy measures that foster mobile broadband penetration and service competition.

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