



## The Relationship between Local Content, Internet Development and Access Prices

### Main Findings and Conclusions

Societies have a rich heritage and knowledge base that should be recognised, recorded and shared for the benefit of people throughout the world. Much of the world's content remains inaccessible even to the local population, not to mention at a broader level.

The content that is most important to people is typically in their own language and is relevant to the communities in which they live and work. These communities may be defined by their location, culture, language, religion, ethnicity or area of interest and individuals may belong to many communities at the same time. Further, communities evolve so what is relevant will change over time. This relevant content is often referred to as "local content".

Technology can help support the recognition, creation, preservation, dissemination and utilisation of local content and there have been several important technological advancements in recent history. Technological developments such as the printing press, the phonogram, telephony, radio, television, photocopying machines, recording media, mobile phones and personal computers, among others, have greatly increased our ability to create and disseminate content.

The Internet represents another historical advancement in the development and dissemination of content. It has, first and foremost, helped empower users as content creators. The Internet has provided a platform for crowd-sourced content creation and community-developed and peer-reviewed knowledge bases such as Wikipedia. It has also allowed individuals to exercise greater choice and control over the content they consume in contrast to the limited channels of traditional broadcasting. It plays a key role in all steps from content creation to its distribution but perhaps its largest contribution is the potential it gives to creators to disseminate their content widely and nearly instantaneously at a very low cost.

Policy makers around the world in ministries of culture look for ways to promote the creation and preservation of cultural heritage, including elements that are oral, tangible and intangible. At the same time, policy makers in communication ministries focus on ways to ensure that information and communication technologies and services, such as Internet access, are available and accessible to the population. This research confirms that the goals of these two important government entities are intertwined.

This empirical research shows that **there is a strong correlation between the development of network infrastructures and the growth of local content**, even after controlling for economic and demographic factors. The statistically significant relationship is evident using several different measures of local content (the number of visible top-level domains in use per country code, per capita; Wikipedia articles per language per capita; and blogs per capita) and several measures of Internet development (broadband penetration rates, autonomous systems per capita, international bandwidth per capita and routed IPv4 addresses per capita).

In addition, this research finds a significant relationship between the development of international bandwidth and the price of local Internet access. The results indicate that **more developed local Internet markets tend to report lower international prices for bandwidth** and vice versa: **markets with more intense international Internet traffic tend to report lower local prices**. A similar relationship was detected between the degree of development of local Internet networks and the level of international prices in developing economies. In particular, countries with a more developed local market also tend to report lower prices for international Internet connections. This relationship is not visible in developed economies that tend to have a much more developed infrastructure.

## Policy considerations

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The empirical analysis in this paper shows a strong correlation between local content, infrastructure development and access prices but it is not able to positively determine the direction of causality due to data constraints and complex mutual dependencies. What is most likely is that the three elements are connected and feed into each other in a virtuous circle. The inter-linkages between the different elements lead to three key lines of policy considerations evolving out of this research: fostering content development, expanding connectivity and promoting Internet access competition.

### *Fostering content development*

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There are two observable trends with respect to the local content variables that were examined for this analysis. First, local content is growing very fast in volume, often at astonishingly high rates across the different measures analysed in this study. Second, its composition is changing and local content is no longer dominated by developed countries. Various measures show that developing countries are quickly becoming important sources of content and their share of global content creation is increasing. The growth of local content varies across countries and is tied to enabling factors such as the level of Internet infrastructure development.

Creating local content, recording and distributing it benefits from a specific set of skills and tools. Governments should evaluate the level of multiple skills, such as ICT skills, knowledge and attitudes which would lead to the critical mass of competences existing at local level. Key steps include improving basic literacy (*e.g.* drafting, language, etc.), critical thinking ability, as well as media and digital literacy skills. Policy steps to improve ICT literacy should include both the formal educational system and lifelong learning. Targeted programmes aimed at certain segments of the youth and adult population can also teach necessary skills to members in a community who can then help others create, record and disseminate local content.

In addition to Internet connectivity, ICT equipment such as computers, mobile phones, cameras, scanners and audio/video recorders are important tools for digital content creators. Any trade barriers, taxes or levies that limit the development, production and importation of these devices, or increase their cost, could have a negative effect on local content creation and distribution at the local level.

Software is an important component of digital content creation but its cost can mean that it is beyond the reach of many users. Open software and free online tools are an increasingly important way for users throughout the world to access sophisticated software that can help in all steps of content creation. The amount of interoperability among software and media will likely be an important factor for wide-spread dissemination of content.

Some of the key components of content development are the collection, localisation and preservation of content to be disseminated. Anything that helps reduce the price of recording media for content creators and distributors can help promote the recording and dissemination of local content. Some countries have chosen to impose levies on blank media (*e.g.* CDs and DVDs) as a way to help compensate artists for illegal copying of their work. These levies may benefit certain content creators receiving compensation as part of a licensing collective but the blanket nature of the levies means that many other content creators outside the collective must pay more to record and distribute their original content. Governments with these levies in place may wish to re-evaluate their effectiveness and the impact of these levies on overall content creation.

Policy makers could examine the development of domestic content hosting services and look for ways to promote the development of a local content hosting as a way to reduce international transit costs and increase the speed of content storage and delivery.

Governments collect and distribute information that is both relevant to communities and local in nature and should be role models for local content creation. Previous work such as the OECD's Council Recommendation on Public Sector Information can help provide guidance. For example, policy makers should look for ways to make more public-sector information available via new media. This will increase the amount of available relevant local content and help increase demand for Internet connectivity as a way to access this newly provided content. Examples of public data projects and platforms include Microsoft's Open Government Data Initiative and Google's Public Data Explorer.

Governments should embrace the idea of openness where public sector data is deemed to be available for use free of charge unless specifically exempted for protection of national security interests, personal privacy, the preservation of private interests or where protected by copyright, or the application of national access legislation and rules. When public sector information is not provided free of charge, it should be priced in a way that is fair, that facilitates access and re-use, and ensures competition. Where possible, costs charged to any user should not exceed marginal costs of maintenance and distribution, and in special cases extra costs for example of digitisation.

Governments should make public-sector information available to as much of the population as possible. This includes provisions for those with special needs, including the elderly, persons with disabilities, the vulnerable, or with gender or cultural differences. Steps to introduce more inclusiveness will help promote the take-up of services and the potential for content creation and distribution.

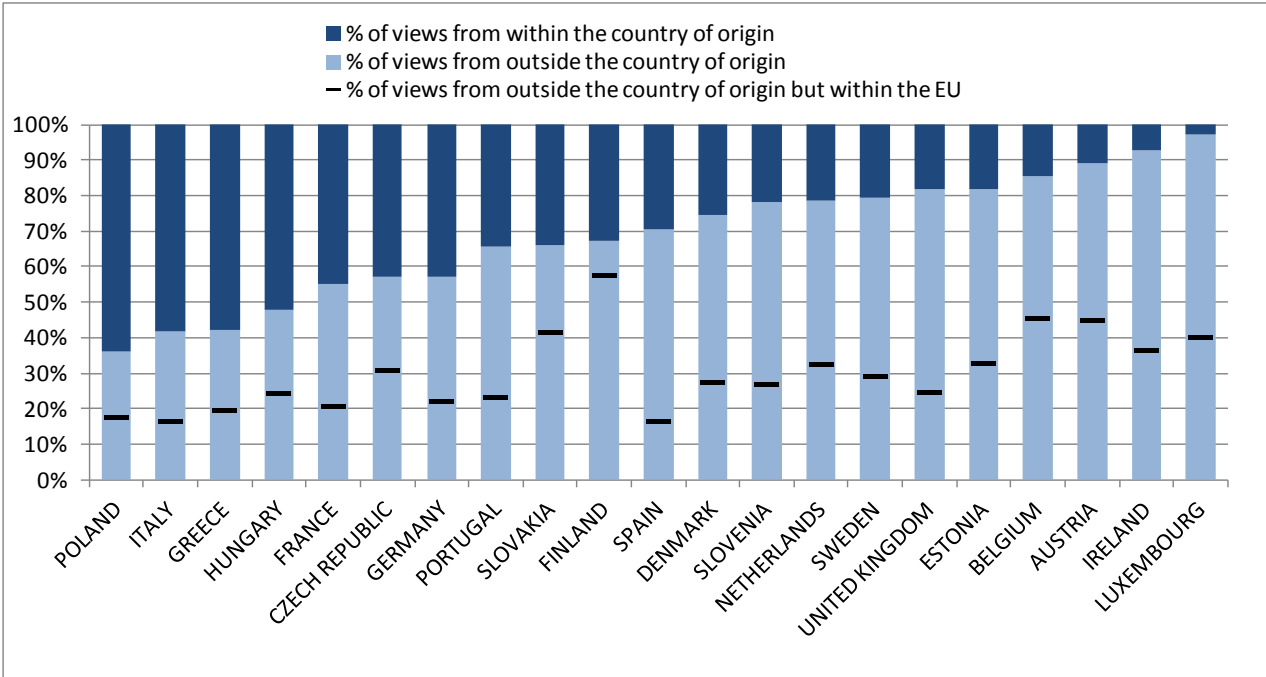
Policy makers should take the necessary steps to foster an innovative environment for content creation. Creative ecosystems often evolve around educational institutions and areas with inexpensive connectivity.

*Expanding connectivity*

The findings of the research highlight the significant relationship between infrastructure development and local content creation. There are a number of steps policy makers can take to improve connectivity and support the development and dissemination of local content. In certain cases this may require a renewed focus on policy coherence to ensure that promoting the growth of a national firm in a developed country is not tied to maintaining monopoly power in another.

Mobile networks are the most prevalent Internet platform in the world, and are often the main telecommunication networks in developing countries. Efficient spectrum policy will be an important tool to help improve communications capacity and create a platform for local content development. Policy makers could re-examine their existing allocations and look for spectrum that could be available to the market, particularly as the value of certain frequency bands is growing as a result of more mobile broadband usage.

**YouTube: National vs. international viewing of domestically uploaded content**  
 % of views of domestically uploaded content viewed from within and outside of the country of origin.  
 Selected countries in Europe, first half of 2011



Source: YouTube (Google).

An important area for focus is international Internet connectivity. This research finds that broadband prices are lower in countries that have more international Internet connectivity, even after controlling for other demographic factors. Governments should look at existing international capacity conditions and consider ways to increase international capacity into their country. Steps that lower the costs and barriers of delivering international bandwidth are particularly important. International bandwidth is both a mechanism for delivering local content out to the world and a means of making global knowledge available on a local level. The characteristics of local content, however, mean that much of the content that is created and distributed is domestic in nature and should be distributed locally without paying for expensive international data transit.

The development of local Internet exchanges can promote the local distribution of content in a cost-effective way. Previous research shows that, when allowed to do so, market participants will self-organise efficient Internet exchange points, producing Internet bandwidth to the benefit of the economy. Governments should take necessary steps to promote the development of local Internet exchanges as a way to minimise distribution costs.

Policy makers may need to evaluate the impact of network rollouts in areas connected to new telecommunication networks and those which may be bypassed or underserved. In some cases the marginal cost of extending a backhaul connection to an additional community could be much lower than the benefit it could potentially provide. Any government investment in road construction or electrification should consider installing the infrastructure for fibre-optic networks at the same time to save on the significant digging costs. These backhaul networks can support both fixed and mobile Internet connectivity over the last kilometre.

### *Promoting competition*

Policy makers should focus on improving competition as this lowers prices in markets and lower prices are correlated with more developed Internet infrastructure. The following steps focus on ways to promote competition in markets with a goal of promoting Internet growth and local content development.

Internet connectivity is expanding in almost all countries around the world. Many countries have been able to reduce the digital divide but the divide can also widen in areas with a lack of competition or those without regulatory liberalisation.

First, research has shown that liberalisation of telecommunication markets has generally led to better services and lower prices as it introduces competition into markets for the supply of Internet access and services. The progress of effective liberalisation should continue, particularly in countries that still maintain a monopoly incumbent fixed-line provider. Competition and efficiency should be introduced into markets as a way to increase Internet adoption and help foster the creation and dissemination of locally-produced content.

Government policy should look to reduce barriers to entry in telecommunications, and the supply of Internet access in particular, as a way to promote competition. Complex licensing requirements, foreign direct investment restrictions and other barriers to entry will tend to limit competition and increase the prices that consumers and businesses pay for Internet access.

One of the key areas where governments can improve competition is via spectrum allocations. Countries with more mobile operators in a competitive market typically have lower prices than those with fewer options. Governments can help promote the rollout of multiple Internet-capable mobile networks throughout their countries.

Some governments have used telecommunication monopolies or taxes on telecommunication markets as a key source of government funding but this research highlights that there could be significant costs to that approach related to the development of local content and culture. Unnecessary taxes on telecommunication services reduce adoption, particularly if the collected revenues are not reinvested in network development. Policy makers should minimise the prices that people pay for Internet access as a way to stimulate uptake and promote the development of local content. As the Internet becomes an important foundation of the economy, further research could look at the impact of various taxation schemes surrounding telecommunications on economic growth.

Policy makers in most OECD countries have mandated infrastructure sharing of the incumbent's telecommunication lines as a way to foster Internet competition. Infrastructure sharing can be an effective way to improve competition, either on existing networks or as a way to mutualise the cost of new network rollouts, provided it is done in a way that does not discourage network investment.