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Technological affluence and subjective well-being

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ABSTRACT

This study measures the welfare effects of technological goods using a recent European pooled cross-sectional dataset. We find that fixed and mobile phones, music players and personal computers, including those with an Internet connection, are associated with significantly higher levels of well-being measured by individual self-reported life satisfaction. Further controlling for mobile and broadband country penetration levels, we provide evidence suggesting that the latter matters for life satisfaction, especially for the users who already possess the relevant devices. Keeping life satisfaction constant, we subsequently derive substantial GDP per capita estimates equivalent to a 10 percentage point increase in broadband and mobile phone penetration.

1. Introduction

Technology is now an integral part of everyday life. While the economic dimensions of technological amenities have been studied extensively, the literature has largely neglected the individual welfare effects from their existence or lack thereof. Not long ago, before the invention of the television, being able to watch movies or other programmes through a simple device in your living-room was considered absurd, even more so being able to make and receive calls via a wireless device from wherever one may be, or 'surf' the internet.

Following Scanlon (1993) we study whether an individual's well-being is enhanced due to the ownership of such technological amenities, which in this setting can be viewed as substantive goods. Scanlon himself purposefully avoids determining the characteristics of such a good, which is defined as anything that humans desire and are given to be 'good things'. Thus, a substantive good is "anything that makes people's lives go better" given their own or other people's perceptions and experiences (Harsanyi, 1997). In addition, the purchase and ownership of technological amenities may be mirroring a desired status effect for the individual, as noted by Veblen (1899).

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Given some of the inadequacies of revealed preferences and contingent valuation methods (Luechinger & Raschky, 2009), we use cross-national individual life satisfaction data obtained from the Eurobarometer over the period 2005–2008 and relate it to the ownership of several technological appliances. These include televisions, digital videodiscs, compact disk players, personal computers, internet connections, fixed and mobile phones. Besides this level of comparative ownership, several network technological products and services are related to their stock and usage in each country. Mobile and fixed phones are useful if each person's peers own a device, whereas a television set is unrelated to this phenomenon. Analog or digital fixed internet access is also related to the overall country penetration that allows for tele-work, e-banking and e-shopping activities, among others. We thus additionally incorporate controls for network amenities and draw inferences on the well-being effects of increased participation.

By focusing on the under-researched link between increased participation in digital networks and subjective well-being (SWB), we find a significantly higher degree of life satisfaction for individuals who possess relevant amenities and reside in countries with higher penetration rates (i.e. digital network participation in a country). We further estimate that the GDPC equivalent of a 10 percentage point increase in mobile and broadband penetration on SWB is 2.36% and 2.89%, respectively. By further computing the annual broadband subscription costs incurred by the average consumer as a percentage of GDP per capita, we find a welfare surplus calculated as the differential between the implied monetised benefits and actual costs. The results pose some interesting links that may directly or indirectly affect public policy debates on net neutrality and the European Parliament's acknowledgment of internet access as a fundamental right. [1]

The remaining of this study is organized as follows: Section 2 introduces the key literature related to the economic impact of technology together with an overview on the economics of SWB. Section 3 describes our data and the econometric methodology. Section 4 presents the results of our model. Section 5 offers some discussion on the implications of our results, policy impacts and limitations. Section 6 concludes.

2. Literature review

2.1. Technology, innovation and growth

The economics of technology literature has primarily focused on the measurable returns of public or private technological infrastructure on economic growth, productivity, country competitiveness, imports and exports. Hardy (1980) was the first to look at the importance of fixed phone ownership on economic development. Using a broader dataset Roeller and Waverman (2001) study the economic impact of fixed telephony on growth and find significant returns for high penetration countries. Cronin, Parker, Colleran, and Gold (1991) look at the impact of fixed phones on productivity in the US and find that 'the amount of US telecommunications investment at any point in time is a reliable predictor of the level of US economic activity at a later point in time'.

Lehr, Gillett, Osorio, and Sirbu (2006) present a first attempt to measure broadband's impact by applying controlled econometric techniques to national-scale data. After controlling for community-level factors that affect broadband availability and economic outcomes (income, education, and urban vs. rural character) they find that broadband access enhances economic growth and performance. Koutroumpis (2009) measures the compound annual returns from broadband infrastructure in OECD countries' economic growth using a simultaneous equations model that accounts for the existence of reverse causality. He finds significant returns on economic growth for high penetration countries and identifies the existence of critical masses in broadband network technologies. Greenstein and McDevitt (2009) measure the economic value of broadband in terms of revenue and consumer surplus for a US sample between 1999 and 2006. They find that broadband accounted for $28 billion of the internet access revenue with households generating $20–$22 billion of this revenue.

The effects of mobile networks have recently been the theme of micro focused studies. Using survey data, Jensen (2007) shows that the adoption of mobile phones by fishermen and wholesalers in South India 'was associated with a dramatic reduction in price dispersion, the complete elimination of waste and near-perfect adherence to the Law of One Price', resulting in increases in consumer and producer welfare. In another study, Muto (2008) focuses on the effects of mobile network coverage on farmers' market participation in Uganda. He suggests that increased information flow decreases crop-marketing costs especially for perishable goods (bananas) in remote areas. The study finds strong effects on market participation for remote farmers due to the expansion of the mobile networks' coverage.

2.2. The economics of subjective well-being

SWB includes measurements of cognitive judgements individuals make regarding the way they live, including perceptions about their happiness, life satisfaction (LS), morale, job satisfaction, etc. (Diener, 1984). The economics literature has

[1] Peter Kramer (European Business Review, 02/12/2009): "Under the new EU rules, national telecoms authorities will furthermore have the power to set minimum quality levels for network transmission services so as to promote "net neutrality" for European citizens... A new internet freedom provision, included in the package at the insistence of the European Parliament, makes clear that in view of the fundamental rights that EU citizens enjoy ... national authorities cannot restrict internet access for public policy reasons unless there has been a prior, fair and impartial procedure and effective and timely judicial review".