



# The Internet Neighborhoods: A Geospatial Analysis of Internet Adoption

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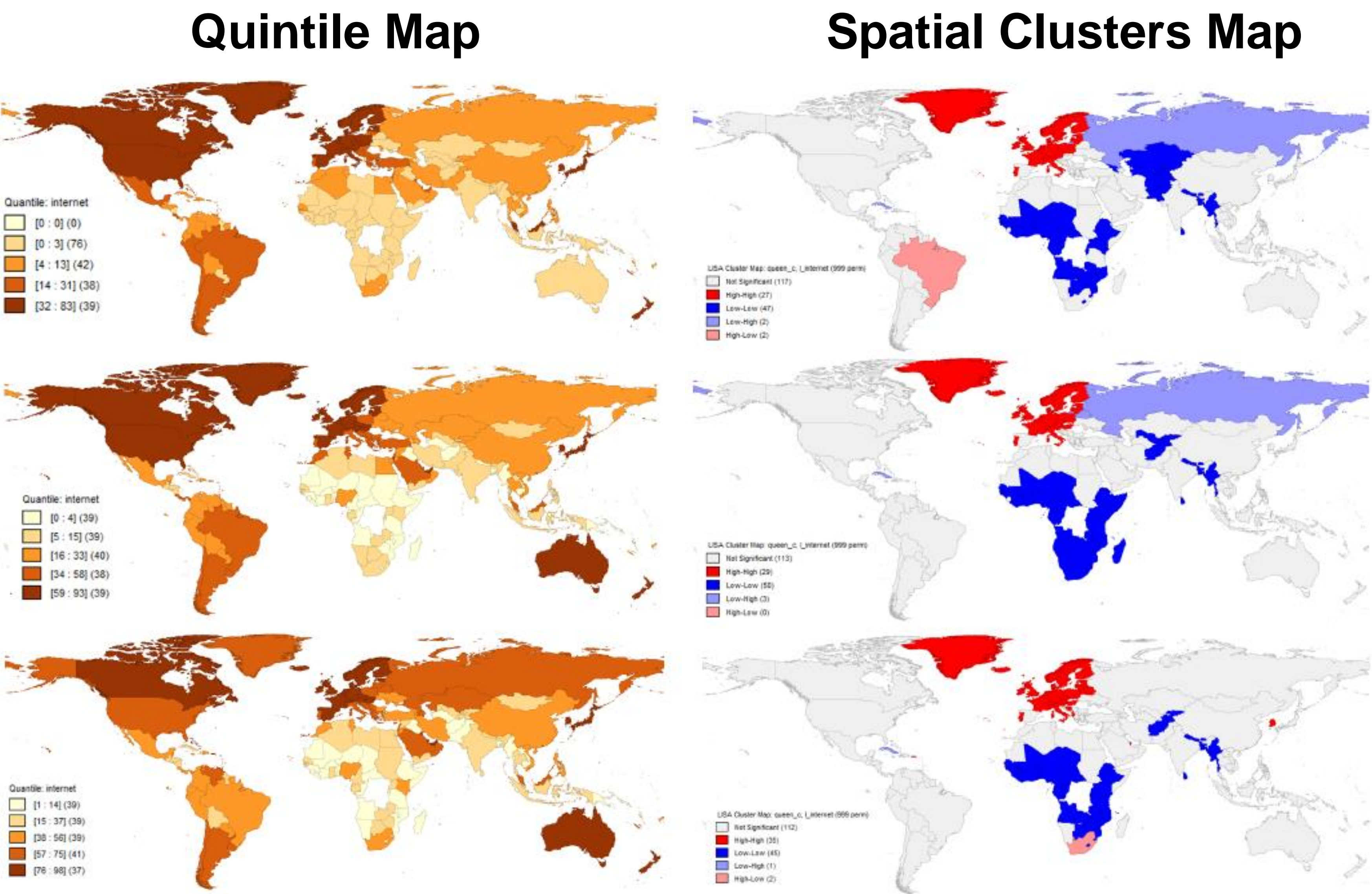
## Background

Opposing the optimistic outlook of the Internet becoming a leveler for global income inequality, the internet may be widening the existing the chasms by improving productivity, communications and enabling new possibilities only in developed countries. While scholars have attempted to identify the determinants of internet adoption, most of the literature has overlooked the possibilities of spatial spillovers in the process of internet adoption. This oversight in the literature is surprising as macro-geographic neighborhood effects have been well-established in the literature of development economics and knowledge spillovers. Examining global internet adoption data, this paper investigates the role of location in internet adoption with a spatial econometric methodology and identifies good and bad neighborhoods with spatial clustering techniques. The findings suggest that there is a growing importance of location in internet adoption globally and imply that in order to promote internet adoption, development aid and international policies may be more effective if they target clusters of countries than single countries.

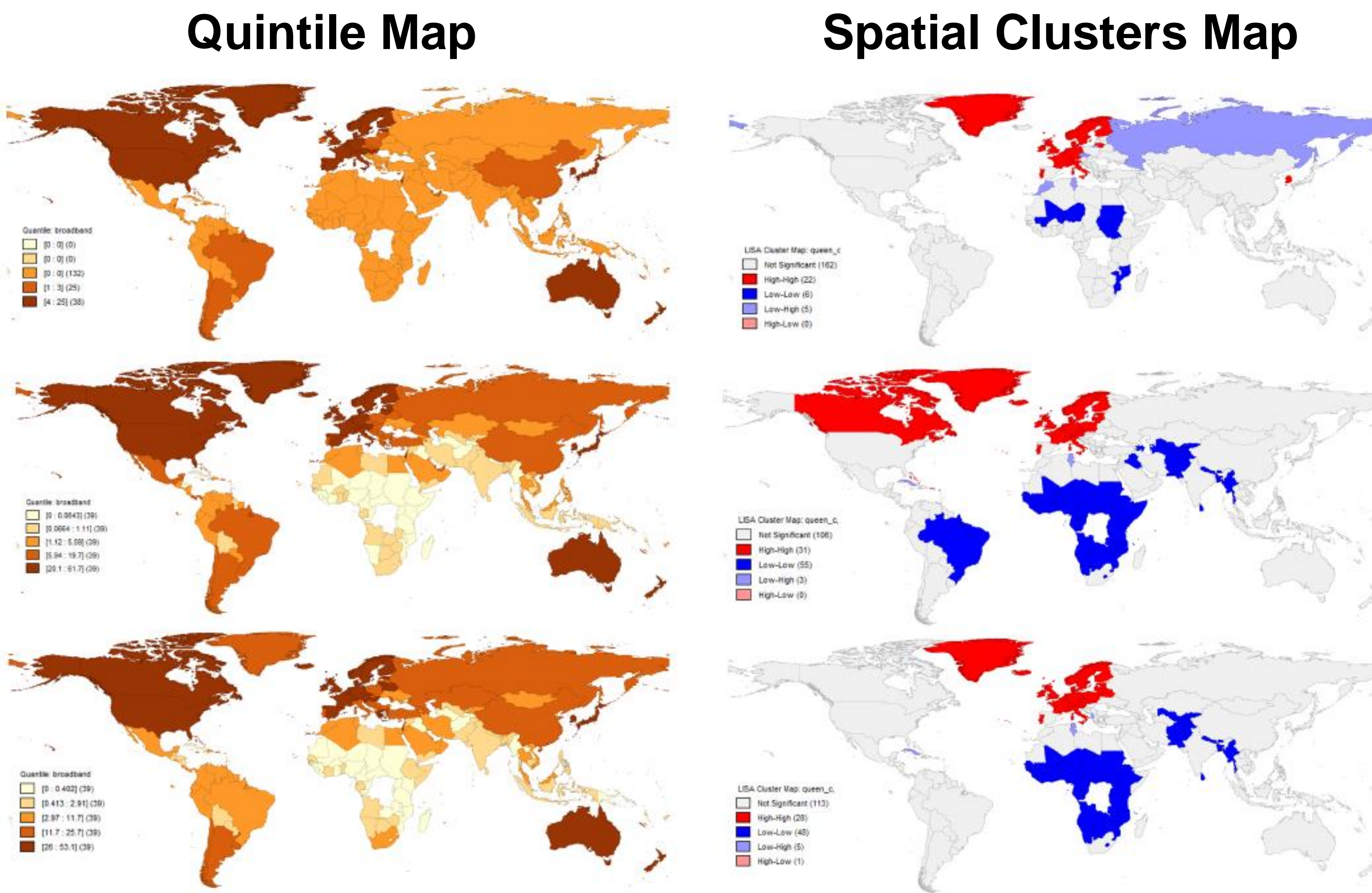
## Specific Aims

Methodologically, the presence of spatial spillovers will point to a misspecification in previous models of internet adoption. Practically, the presence of spatial spillovers provides a new perspective in development aid distribution.

## Internet Users (per 100 people)



## Fixed Broadband Subscriptions (per 100 people)



## Spatial Econometric Model

Considering the presence of spatial autocorrelation, our model is specified with a spatial lag:

$$Y_i = \alpha + X\beta + WY_i + \varepsilon_i$$

where Y is the percentage of internet users in a country,  $\alpha$  is a constant for all observations, X is a vector of control variables and  $\beta$  is its estimated parameter, WY is the spatial lag of dependent variable, and  $\varepsilon$  is the error term.

| internet       | 2014                       | 2009                      | 2004                     |
|----------------|----------------------------|---------------------------|--------------------------|
| Constant       | 1.37<br>(2.94)             | -6.686***<br>(1.877)      | -4.579***<br>(1.383)     |
| W_internet     | 0.405***<br>(0.073)        | 0.337***<br>(0.0766)      | 0.248*<br>(0.116)        |
| gdp            | 0.000211***<br>(0.0000444) | 0.000295**<br>(0.0000965) | 0.000410**<br>(0.000129) |
| tele           | 0.318***<br>(0.0812)       | 0.286*<br>(0.136)         | 0.295**<br>(0.123)       |
| urban          | 0.129**<br>(0.0489)        | 0.121**<br>(0.0438)       | 0.0296<br>(0.0362)       |
| old            | 0.272<br>(0.239)           | 0.775**<br>(0.301)        | 0.771**<br>(0.317)       |
| pri_rate       | 0.180***<br>(0.0382)       | 0.100<br>(0.0558)         | -0.0483<br>(0.0757)      |
| bus_days       | -0.0910**<br>(0.0356)      | -0.0134<br>(0.00908)      | -0.0128<br>(0.0139)      |
| developed      | 14.714***<br>(2.787)       | 7.73**<br>(2.44)          | 1.374<br>(1.748)         |
| N              | 195                        | 195                       | 195                      |
| R <sup>2</sup> | 0.8239                     | 0.8345                    | 0.7833                   |

## Conclusion

- Even after controlling for established determinants of internet adoption, internet adoption is positively affected by internet adoption of countries in close proximity.
- Spatial spillovers are present in internet adoption for both metrics of internet adoption – internet users and fixed broadband subscriptions.
- The omission of spatial spillovers in previous models could lead to biased and inconsistent estimates.

## Limitations

Since internet adoption varies geographically within countries as well, a more precise analysis can be conducted with more granular data that specifies internet adoption by agglomerations or sub-regions. This will also allow better definitions of neighborhoods within and across countries.