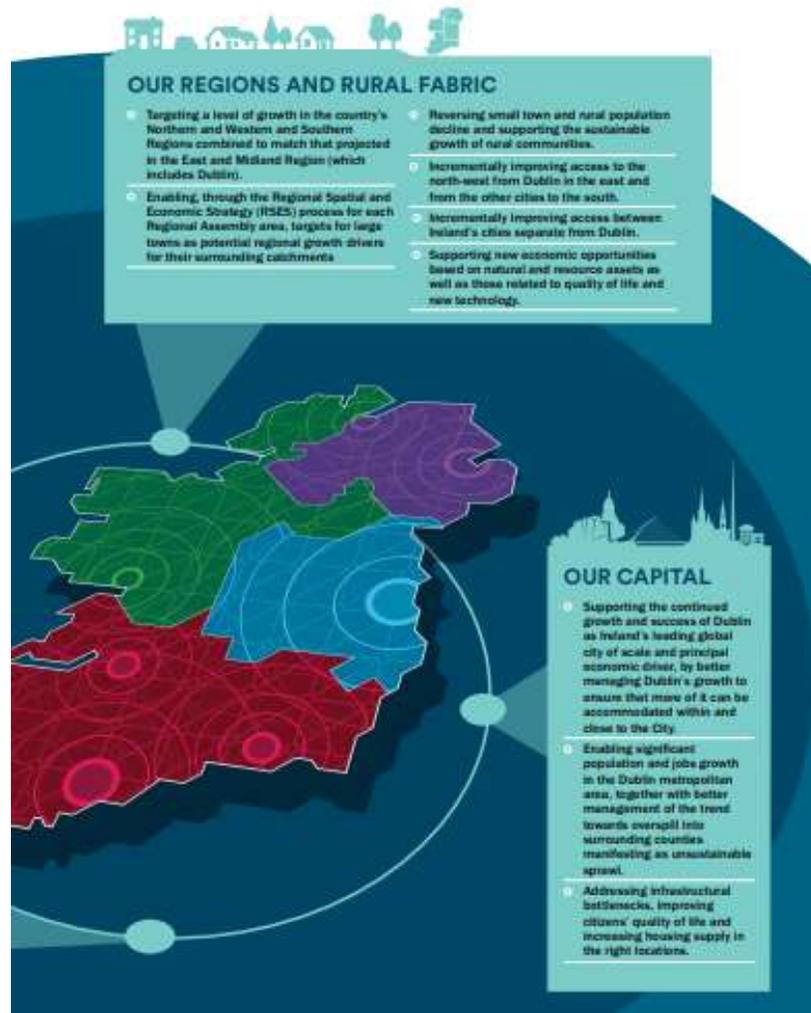


Trickle down effects of Irish Urban Centres

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Context – City-Led Regional Development



Overview of Presentation

- The aim of this paper is to analyse the population growth of rural regions based on their proximity to urban centers.
- Our analysis is framed within the spread-backwash effects literature and it attempts to analyse whether growth processes taking place in urban or intermediate regions positively spread outside the region itself (spread effect), or if they attract resources at the expenses of close by non-urban regions (backwash effect).
- The dependent variable for our analysis is the rate of population growth between 2011 and 2016 at electoral district level.

Spread-Backwash Effects

- This concept was originally introduced in order to study trade linkages (Myrdal, 1957; Hirschman, 1958), but it has been also used to conceptualize and investigate urban-rural interactions (Gaile, 1980; Henry et al., 1997).
- Urban and rural performances are considered to be interrelated through a complex set of linkages, producing a series of positive and negative spatial externalities.

Spread Effects

- A spread effect refers to a general benefit for a place due to its closeness to another well-performing place.
- Transposing this definition to an urban-rural context, a spread effect can be defined as the positive effect that the growth in an urban centre yields in the nearby rural areas.

Backwash Effects

- However, growth in urban areas can have adverse effects on the nearby localities if growth in the core region attracts people and economic activity away from these peripheral areas.
- This growth in urban (core) areas may lead to a decline in rural (peripheral) population and employment (a backwash effect) if rural-to-urban flows weaken rural economies.

Data

- The data used in this paper is derived from the Irish Census of 2011 and 2016.
- The dependent variable is population growth between 2011 and 2016.

Variable Definition

Variable	Description
Population Growth	The growth rate of the population of the rural ED between 2011 and 2016
Distance from Urban Area (km)	The distance in km from the nearest major urban area
Distance from Dublin (km)	The distance in km from Dublin
Population Change Urban	The growth rate of the population of the nearest urban area between 2011 and 2016
Employment Change Urban	The growth rate of employment of the nearest urban area between 2011 and 2016

Control Variable Definition

Variable	Description
Old Age Dependence Ratio	The ratio of those aged over 65 to those of working age
Proportion Employed in Manufacturing	The proportion of those employed in the ED engaged in manufacturing
2011 Deprivation Index	The 2011 Public deprivation index proxying for the income of a region
Population Density	The population density of the rural ED
Proportion of Population with Third Level	The proportion of the ED with third level education

Data – measuring spread and backwash

- We model the relationships with the closest urban region, including its distance and its distance weighted employment and population growth rate.
- We control for basic economic and social characteristics of rural regions at the beginning of the period, such as the deprivation index, unemployment rate, education etc.

Data – measuring spread and backwash

- The distance from the major urban areas has been also included in the quadratic form so as to allow for potential nonlinearities. (There may not be a linear relation)
- In this respect distance may have a negative effect on growth, but decreasing for higher values (positive quadratic term).
- The interaction of distance with the growth of employment and population in the closest urban area is included in the model in order to verify whether and how the spatial spillover effect changes with distance.

Key Variables of Interest

- Distance in km from nearest major urban area – measures pure distance effects. The impact of distance from a major urban area on rural regions population growth rates.
- Distance in km from Dublin - measures pure distance effects. The impact of distance from Dublin on rural regions population growth rates.
- Employment growth rate of nearest urban area – this measures the spillovers from growth of employment in the nearest urban area on the growth in population of rural areas.
- Distance in km from nearest major urban area*Employment growth rate of nearest urban area – measures the extent to which there is spatial decay in the spillover of the impact of growth of employment in the nearest urban area on the growth in population of rural areas.
- Population growth rate of nearest urban area – this measures the spillovers from growth of population in the nearest urban area on the growth in population of rural areas.
- Distance in km from nearest major urban area*Population growth rate of nearest urban area – measures the extent to which there is spatial decay in the spillover of the impact of growth of population in the nearest urban area on the growth in population of rural areas.

Defining Cities

- We include five major urban areas in our analysis.
- These are Dublin, Cork, Galway, Waterford, and Limerick.
- Future work will incorporate other urban areas.
- Note the unit of analysis is NOT these cities but all areas outside of these cities.

Methodology

- The method employed is an Ord. Least Squares estimation (with spatial autoregressive spatial error models also estimated).

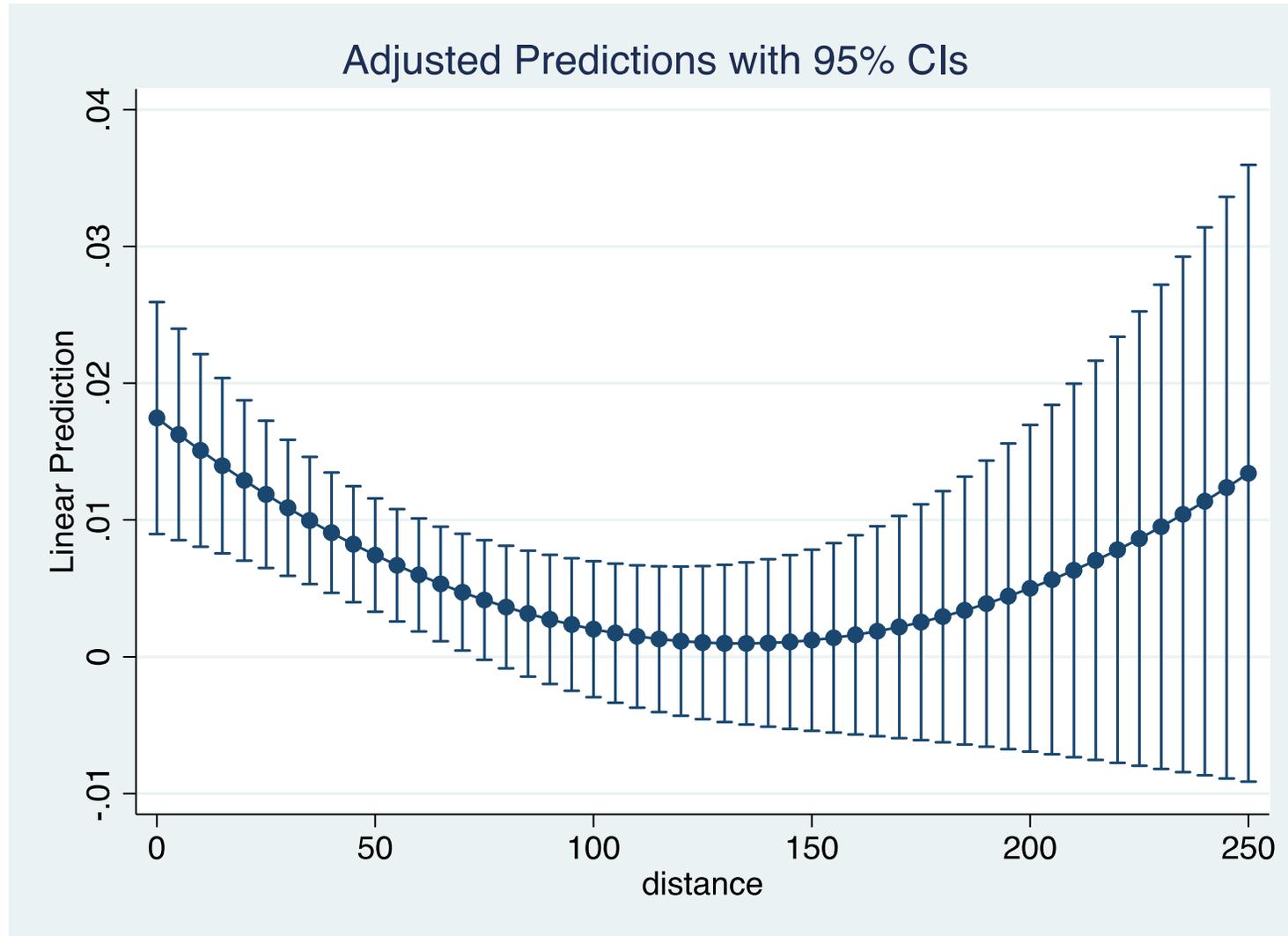
- $$\Delta p_{it} = \beta_0 + \beta_1 dis_{ij} + \beta_2 dis_{ij}^2 + \beta_3 disDublin_{ij} + \beta_4 disDublin_{ij}^2 + \beta_5 \Delta emp + \beta_6 dis_{ij} * \Delta emp + \beta_7 \Delta pop + \beta_8 dis_{ij} * \Delta pop + \beta_9 Z_i + \varepsilon_i$$

- Where

- distance to nearest urban area effects are determined by $\beta_1 dis_{ij} + \beta_2 dis_{ij}^2$
- Dublin effects are determined by $\beta_3 disDublin_{ij} + \beta_4 disDublin_{ij}^2$
- Employment growth in nearest urban areas effects are determined by $\beta_5 \Delta emp + \beta_6 dis_{ij} * \Delta emp$
- Population growth in nearest urban areas effects are determined by $\beta_7 \Delta pop + \beta_8 dis_{ij} * \Delta pop$

- Control effects are included in $\beta_9 Z_i$

Results – Example of Average Distance Effect

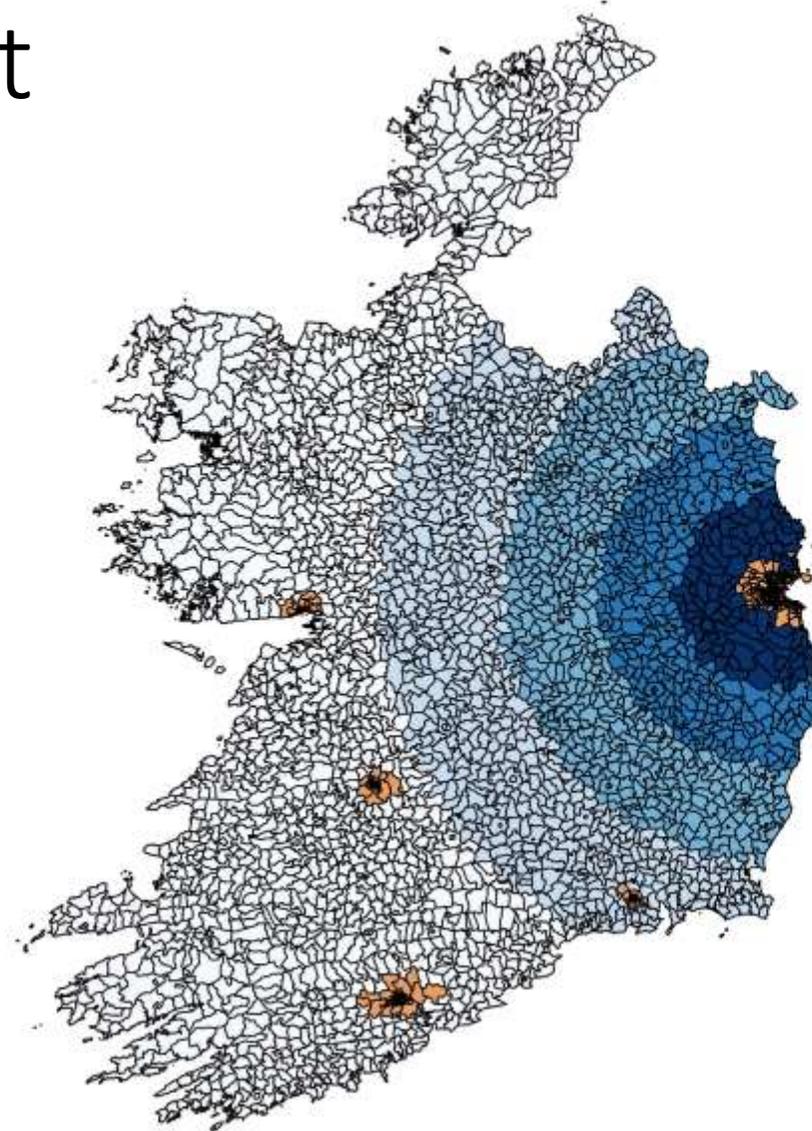
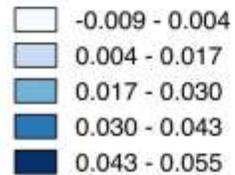


Results – Dublin Effect

- The proportion of population growth that the module predicts on the basis of distance to Dublin
- Pure distance effect
- There is a spread effect.
- Effect diminishes with distance

Legend

EDs2016_INGCVE_region

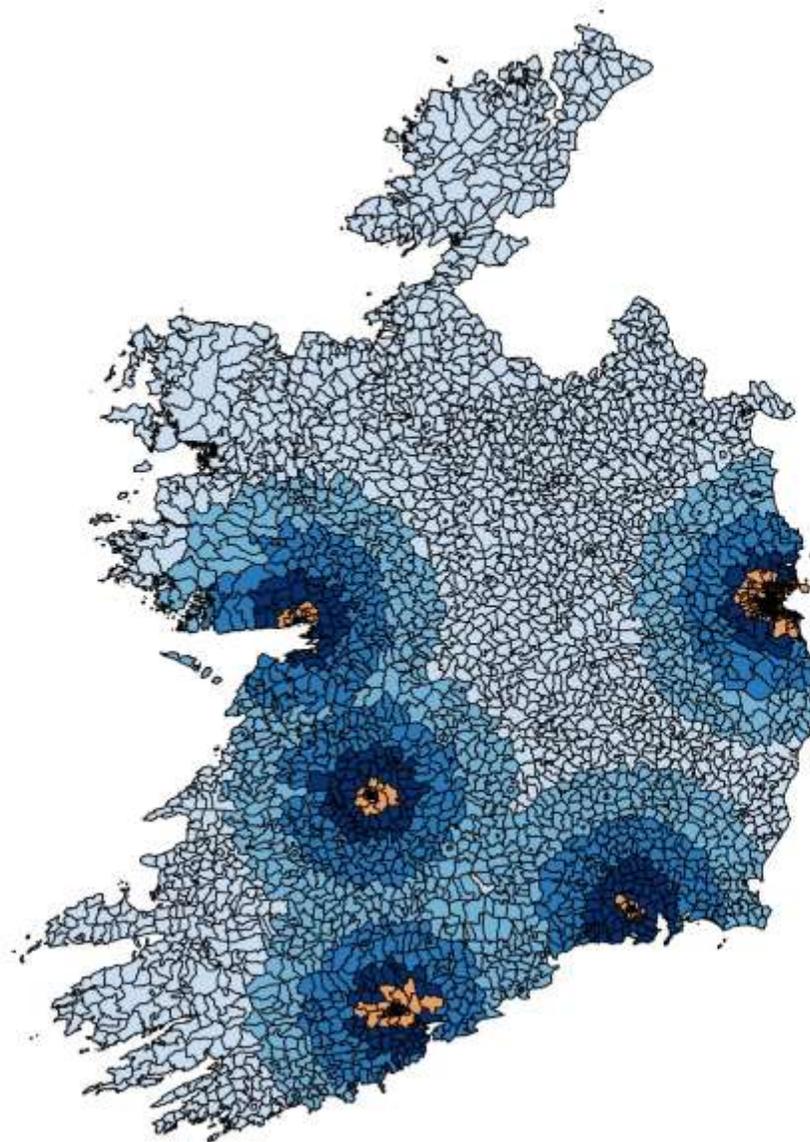
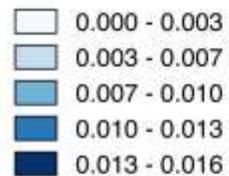


Results – City Effects

- The proportion of population growth that the module predicts on the basis of distance to closest city
- Distance to Dublin constant
- There is a spread effect.
- Effect diminishes with distance

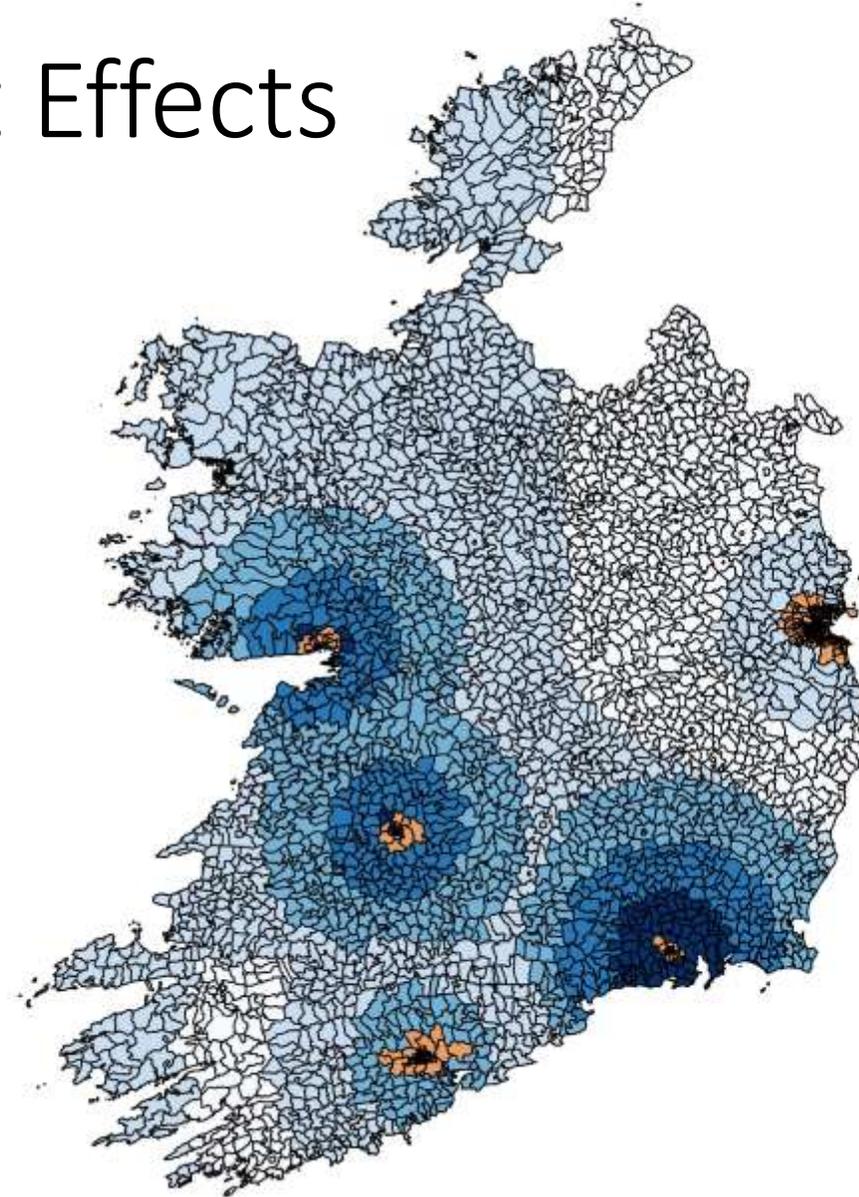
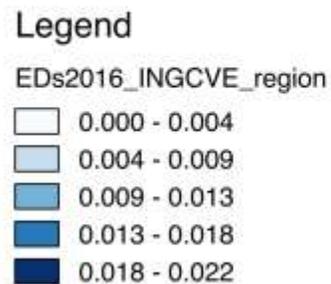
Legend

EDs2016_INGCVE_region



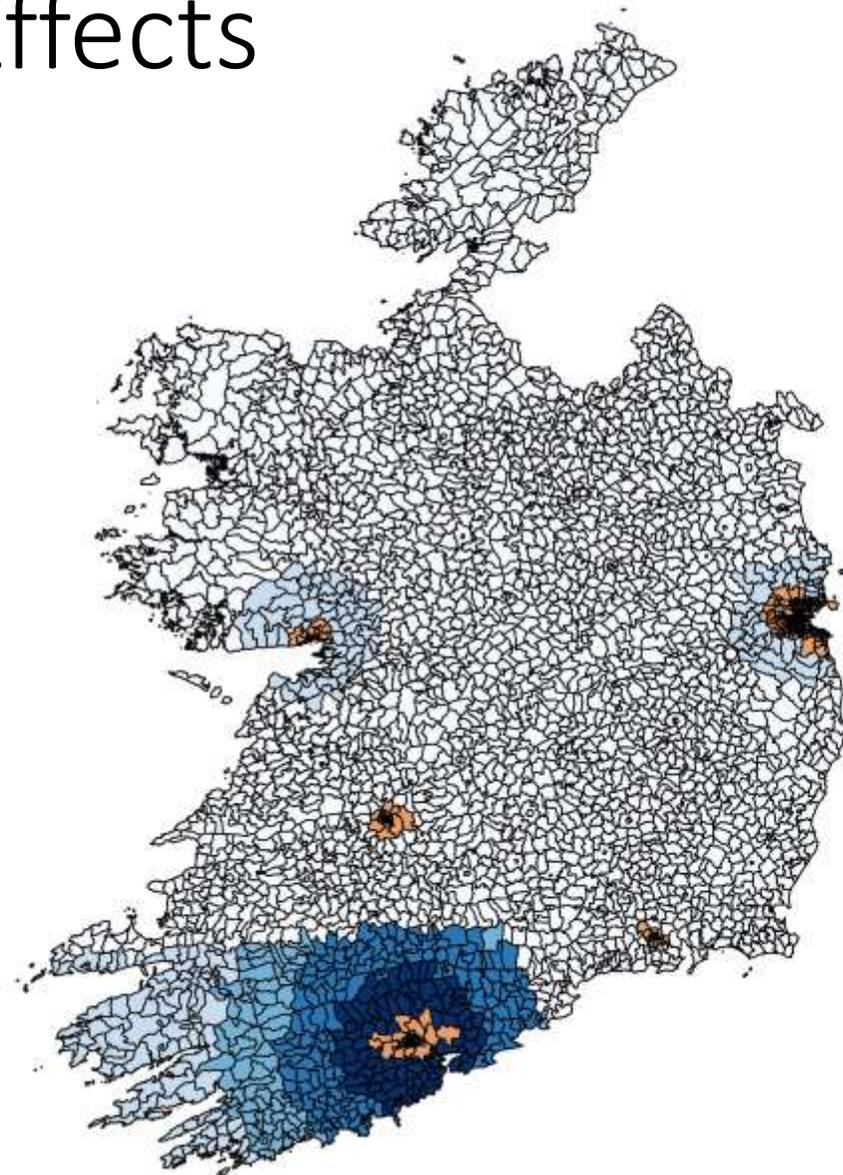
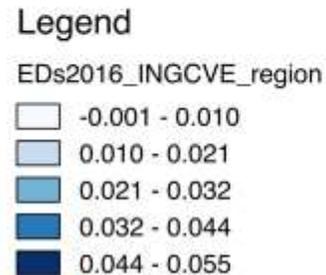
Results – Employment Effects

- The proportion of population growth that the module predicts on the basis of
 - Employment growth closest city and
 - distance * employment growth closets city
- Effect of fast growing employment cities on rural EDs
- Slower growth cities (Waterford) have more positive contribution to rural EDs#
- Fast growth cities are sucking more people in from their hinterlands



Results – Population Effects

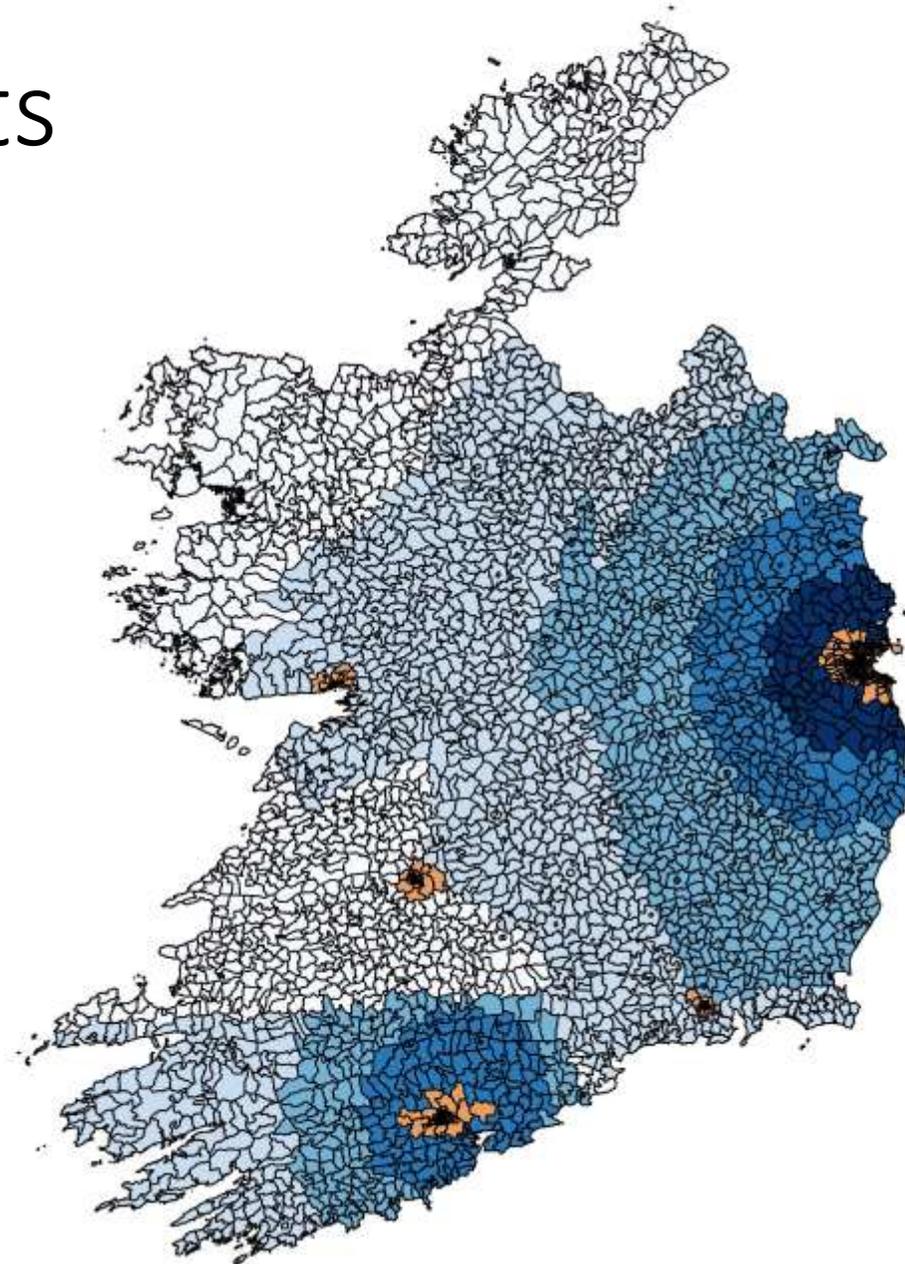
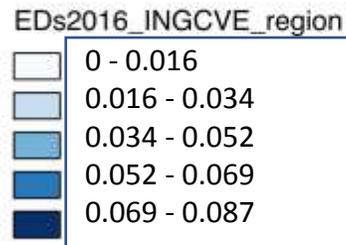
- The proportion of population growth that the module predicts on the basis of
 - Population growth closest city and
 - distance * population growth closets city
- Effect of fast growing population cities on rural EDs



Results – Total Effects

- The proportion of population growth that the module predicts on the basis of previous four variables
- The total effect far greater around Dublin and Cork compared to other cities
- No benefits in some peripheral areas
- Effect of third-tier cities (to be modelled) likely to be smaller

Legend



Future Developments of Analysis

- We will incorporate other, smaller cities and towns in the analysis to account for spillovers from these intermediate urban areas on rural growth.
- We will control for spatial dependence in our model
 - Spatial models have been estimated however the marginal effects calculated here are based on an OLS model.

Preliminary Conclusions

- The model suggests that Eds around Dublin and Cork experience the greatest spillover benefits from their location
- Regions in the periphery observe no positive spillovers from growth in urban areas.
- Spread effects appear to outweigh the backwash effects