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## The Rise and Fall of the Celtic Tiger and the evolution of an Urban System: 1996–2011

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### Abstract

During the 1990s the Celtic Tiger era began in the Republic of Ireland. This article tracks the response of the Irish Urban System to that remarkable period of growth ended abruptly with the Global Economic Crisis of 2008. Using Small Area Population Statistics from Ireland's Central Statistics Office for the years 1996, 2002, 2006 and 2011 it was possible to record growth across the towns and cities of Ireland that constituted the Irish Urban System. The location, size, type and rates of change were recorded and mapped with a view towards discovering the extent to which the urban hierarchy and the spatial distribution was being altered, and by what geographical processes. Over 15 years the national population grew by 26% with most of that growth taking place in urban centres. A clear diffusion outwards from the Dublin region is noticeable and the capital's role in systemic change is explored alongside other factors. The article highlights the changing nature of growth over time and, based on the empirical observations made, identifies a sequence of clear stages in the growth of the urban system. The article concludes with a proposal for a Model of Urban System Evolution under conditions of Rapid Economic Growth based on the distinct phases, or stages, of growth identified in Ireland's towns and cities from 1996–2011.

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## Introduction

The economic boom in the Republic of Ireland, first witnessed in the mid 1990s and better known as the Celtic Tiger, represented a marked shift in Ireland's economic fortunes, and led to an unprecedented growth in population, the vast majority of which took place in urban areas. The reasons for the rapid economic growth have been explored elsewhere (Breathnach 1998; Sweeney 1998). The reasons for the rapid economic growth and subsequent urban developments were evident relatively early in the process considering the rapid growth synonymous with the Celtic Tiger did not become obvious until 1994 (Murphy 2000). While not the focus of this paper the economic boom must be accepted as the main context for changes in the urban hierarchy that ensued. Varied urban processes associated with rapid economic growth can be linked to varied urban outcomes, each with their own particular spatial logic. When considered collectively across the urban system some locations will have been favoured more than others, leading to uneven spatial development within the urban hierarchy. By 2004 Ireland, formerly a region eligible to receive Objective 1 funding from the EU, had become one of Europe's richest countries as measured by GDP per capita. This economic transformation will have had immediate impacts upon the urban system forcing it to evolve, adapt and respond to the new economic reality. This research aims to identify, describe and map changes in the Irish Urban System, specifically looking at the growth of urban centres from 1996 to 2011 and the intercensal periods of 1996–2002, 2002–2006 and 2006–2011. Therefore, the goal of this paper is to identify distinctive spatial patterns associated with pulses of growth, and highlight the contribution varied geographical processes made to the changing spatial distribution and composition of the Irish Urban System as it evolved during the Celtic Tiger era.

## Urban Systems

There is a long tradition in urban geography of exploring cities as part of wider systems of cities (Berry 1964), urban systems (Bourne 1975; Marshall 1989) or city-systems (Pred 1977). These studies are usually concerned with national settlement systems, e.g. Canada (Bourne et al 2011), Mexico (Aguilar & Graizbord 2002), Korea (Davies & Kim 2002) and Sweden (Warneryd 2002), and sometimes from a historical or evolutionary position (Bretagnolle, Pumain & Rozenblat 1998). This use of urban system in a national context should not be confused with studies concerned with daily or regional urban systems (Coombes et al. 1979; Van der Laan 1998) or more recent studies that focus on polycentricity at a variety of sub-national scales (Schwanen, Dieleman, & Dijst 2001;

Brezzi & Veneri 2015). Alternatively, researchers also refer to urban hierarchies e.g. China (Chen 1991) or networks, e.g. Hungary (Beluszky 1999) when discussing urban systems. Research has also taken place at a supra-national scale or continental scale, e.g. the North American Urban System (Simmons et al. 2006) or the European Urban System (Hall 1993; Lever 1993; Hall & Hay 1980; Heidenreich 1998; *inter alia*). Common to all of this work, irrespective of geographical location, is a description of the system, accompanied by an analysis of the population, spatial distribution and the relative performance of cities within the system. Other studies have adopted a more theoretical approach to differential urbanisation within systems (Geyer & Kontuly 1995, 2008; Geyer 1996) by exploring processes as varied as population de-concentration (Kontuly 1992), city size distributions (Pumain 1997), primacy (Johnston 1971), and counter-urbanization (Gkartzios & Scott 2010) among others. While each urban system is unique, national urban hierarchies tend to be quite stable over time, e.g. their size distributions (Polèse 2005) or their economic structures (Davies & Donoghue 1993) with change tending to be incremental. Considering this tendency towards stability it becomes all the more interesting when rapid change becomes apparent in an urban system.

While the spatial extent, spatial patterns, populations, size distributions and changes are all very interesting aspects of specific urban systems, each worthy of investigation in their own right, most research on urban systems has tended to isolate and focus upon particular aspects of the system for analysis. Examples include: regulation (Bourne 1975); modelling interurban growth transmission channels (Pred 1977); identification of growth centres (Hall & Hay 1980); urban policy (Chen 1991); competition between cities (Lever 1993); forces shaping the urban system, e.g. transport or technology (Hall 1993); economic diversification (Davies & Donoghue 1993); convergence and divergence of urban structures (O'Donoghue & Townshend 2005); the effect of conflict on the urban hierarchy (Dimou & Schaffar 2009); or even cross national comparisons (Polèse & Denis-Jacob 2010). Along these lines, this paper focuses on the theme of rapid economic growth and the response of the Irish Urban System. However, before doing so, it is important to review previous research on the Irish Urban System to provide some context for the extent and spread of the changes the Celtic Tiger would bring.

## The Irish Urban System: Previous Research

Despite some suggestion that 'relatively little work has been done on the Irish Urban System' (Huff & Lutz 1979) there does seem to be a reasonable body of work in the

geographical literature, though its frequency appears to have decreased over time. Perhaps this is a function of more work being conducted in report form by planners and other professionals in related fields such as planning and environmental policy (*Brady Shipman Martin* [BSM] 2000; Bannon 2004). One of the earliest contributions to the study of the Irish Urban System explored and compared population change in the urban systems of Ireland and Scotland from 1956–1961 finding that smaller towns were declining in size unless they were near a large city (Johnston 1969). In 1968 the Buchanan Report, which would influence subsequent generations of spatial planners in Ireland, was published and within the context of regional planning identified and evaluated numerous strategies for urban system development (Crotty 1969). A study of middle-sized Irish towns for the Economic and Social Research Institute (Curtin et al. 1976) identified, ‘not so good towns’ in the hope of spurring development, recognising the role policy might play for these places. Modelling the spheres of influence of higher order centres in the Irish urban system from 1966 highlighted the relative importance of larger cities within the system (Huff & Lutz 1979, 1995) while the first signs of diffusion down the hierarchy associated with widespread urban increases in population were found in the 1970s (Horner & Daultrey 1980) with some evidence of a spatial shift from east to west. Exploring population over a similar period (Hourihan 1983) identifies the growth of ‘satellite’ or ‘dormitory’ towns, though this and subsequent research (Hourihan 1992) tended to focus on the largest cities in the country. Medium-sized towns grew most rapidly during the 1970s, particularly those along major routes to Dublin (Cawley 1990). By the 1980s there was a slow-down of population growth and larger towns seemed to be growing most rapidly (Cawley 1991). Declining towns outside the spheres of influence of the largest centres, an east west imbalance in population distribution and the emergence of clearly defined city and satellite systems led to a call for a national strategy (Cawley 1996). Based on empirical analysis of the determinants of growth in urban centres to 1991, it was found that the best predictor of growth was proximity to Dublin (Lutz 2001)

Arguably, one result of the trends identified in the 1980s was a drift away from the exploration of the national settlement system towards an exploration of specific elements of the urban system. Perhaps this was not surprising given the assertion there was ‘nothing to suggest a return to the rapid growth of 1970s’ (McManus & Brady 1994) as Dublin’s population saw a small decline from 1986–1991. Emphasis now focused on commuting and the growth around the largest cities in the country, particularly new residential communities on the western edges of

Dublin. In subsequent years urban sprawl was identified in a ‘western ring’ around Dublin and extending to the urban-rural fringe - a reflection of the demand-led forces for housing (Gkartzios & Scott 2010), and in sharp contrast to the highly state-interventionist dispersed development of the 1970s and 1980s (Williams & Shiels 2000). By the mid-1990s the first impacts of the Celtic Tiger on the urban system were becoming visible. However, there were still challenges as the urban system was particularly weak in the Border, West and Midlands regions of the country (Walsh 1997) where there was a decline of population in smaller towns (under 3000 population) but despite some weaknesses it was becoming increasingly obvious that the country and its urban system were evolving and the role of city regions was recognised across the whole island of Ireland (Horner 2000).

With the arrival of the Twenty-First Century spatial strategies came to the fore with an increasing recognition of the role of spatial planning as the National Development Plan (NDP) of 2000–2006 and the new National Spatial Strategy (NSS) (2002) emerged. A comprehensive report on the state of the Irish Urban System at the turn of the century was produced at this time (BSM 2000). As rapid economic growth continued, growth across most centres in the urban system was recorded for the 1990s (Bannon 2004). Research on the Irish Urban System evolved to explore impacts of the growing economy, e.g. the changing spatial patterns and other side effects such as social polarisation (Breathnach 2002) and inequality (Kirby 2002); or an increasing emphasis on the ‘polycentric turn’ (Davoudi & Wishardt 2005); or spatial development strategies that explored the relationship between specialisation and urban size (McCafferty et al. 2013). The role of FDI and internationally traded services (Grimes 2006) were changing the organisation of space in a dynamic economy (Convery et al. 2006) as evidenced by an increased focus on decentralisation from Dublin and polycentricity with Dublin at the centre of an incipient global city region (Sokol, Van Egarat & Williams 2008). After the ‘global economic crisis’, and in particular the collapse of a huge ‘property bubble’ which led to Ireland’s bailout in 2010 by the ‘Troika’ (made up of the European Commission, European Central Bank and International Monetary Fund), research became more circumspect in reviewing the period of rapid growth before the crash. Problems with the NSS were highlighted (Meredith & Van Egarat 2013) and the contribution of the NDP and NSS, identifying how they ‘paved the way for a more balanced and more polycentric urban structure at the national level’ was conducted (Grist 2015). Despite the emergence of the NSS and NDP as spatial planning instruments work on the Irish Urban System post-2002

seems to be largely absent. Thus, the remainder of this paper will attempt to fill that gap and explore the key characteristics of the Republic of Ireland's urban system evolution from 1996–2011, and analyse that change with a view towards creating a more widely applicable model of urban system change in a period of dynamic growth.

### Data and Characteristics of the Irish Urban System

All population data used for this study come from Census SAPS (Small Area Population Statistics) published by the Republic of Ireland's Central Statistics Office. The data were drawn from the SAPS for the years 1996, 2002, 2006 and 2011. There are normally 5 years between censuses but because of the 'foot and mouth' crisis in 2001 the census was postponed until 2002. In the Republic of Ireland 'towns, including their environs and suburbs' with a population of over 1500 inhabitants are defined as urban – anything smaller is considered part of rural Ireland. Previous studies have included smaller settlements (Bannon 2004) or chose to focus on larger centres e.g. 5,000 and above (BSM 2000). This research includes urban centres that attained a population greater than 2,000 inhabitants at some point during the study period. The choice to use 2,000 as the population for inclusion in the analysis was based on the desire to reduce the amount of 'churn' in the data set providing greater stability over time, i.e. it removed the likelihood of places entering the analysis at one census only to be removed at the next. There were 110 towns and cities with over 2,000 inhabitants in 1996 rising to 159 in 2011. Over the same period The Republic of Ireland's population

increased from 3,626,087 to 4,588,252, a growth of 26.5%, while the level of urbanisation nationally increased from 58.1% to 62.1%. Thus, we see that for a small country with a relatively small population by global standards, there was both a rapid rate of population growth accompanied by a commensurate increase in urbanisation level, both of which can be linked to a period of rapid economic growth taking place over that time. Another component of the population change was a rapid growth of inward migration from 2004, mainly from EU accession countries of Eastern Europe.

In Table 1, the data were organised by city size range, region and urban type to highlight where and when and in what types of urban centres growth took place. Once these were identified the varied processes of urban growth and development in Ireland could be explored.

The urban system displays a typical size range distribution with more and more centres found in each of the 6 size categories as the hierarchy is descended. The traditional 4 Provinces of Ireland were used for the regional divisions – Munster in the southwest, Leinster in the east, Connaught in the west and Ulster (excluding the Northern Ireland counties of Ulster) in the north of the country. Urban type identified whether, by 2011, places should be identified as: Metropolitan, i.e. the 5 cities of the Republic of Ireland (Dublin, Cork, Limerick, Galway and Waterford); Conurbation, part of the wider metropolitan spheres of those 5 cities (25 places defined); Freestanding, the remaining 129 urban centres. Finally, measurements of each urban centre's distance

TABLE 1

Changes in City Size Distribution, Regional Composition and Urban Typology in the Republic of Ireland 1996–2011

Source: *Central Statistics Office site*

City Size	Number of Centres				% Growth of Urban Centres by Category*			
	1996	2002	2006	2011	1996-2002	2002-2006	2006-2011	1996-2011
>200,000	1	1	1	1	5.5	4.1	6.2	16.6
50,000-199,999	3	3	3	4	9.6	5.5	3.8	19.1
20,000-49,999	5	7	11	15	12.8	11.3	10.9	51.0
10,000-19,999	19	21	24	24	<b>19.9</b>	12.8	12.5	59.0
5,000-9,999	30	33	38	40	18.9	18.7	14.4	<b>72.4</b>
2,000-4,999	52	55	52	75	10.2	<b>31.5</b>	<b>21.6</b>	
<b>Regional Composition</b>								
Leinster	n=76				<b>19.7</b>	<b>25.9</b>	19.2	<b>73.5</b>
Munster	n=48				12.5	12.5	13.4	38.0
Connaught	n=18				15.5	23.7	14.4	52.9
Ulster	n=17				8.9	11.2	<b>19.7</b>	41.1
<b>Urban Typology</b>								
Metro	n=5				8.0	5.2	4.3	18.6
Conurbations	n=25				21.5	<b>23.8</b>	<b>18.1</b>	<b>67.4</b>
Freestanding	n=129				<b>21.7</b>	16.2	13.2	60.1

\*bold signifies the size range, region or urban type with highest % population change for each period

from metro areas and from Dublin were calculated, so that the impact of distance from larger centres could be discerned, this relationship is explored later in the paper. For the remainder of this article the term 'Irish Urban System' will be used to describe the urban system of the Republic of Ireland.

The Irish Urban System has been dominated by Dublin for centuries and it is a classic example of a primate city. Table 1 shows that it clearly dwarfs the remaining 4 cities that fall into the next size category (>50,000 inhabitants), there are a further 15 urban centres in the next category (Tab. 2.) and many of these would broadly fit into a category called county towns, conveniently making it 20 urban centres with a population greater than 20,000 inhabitants.

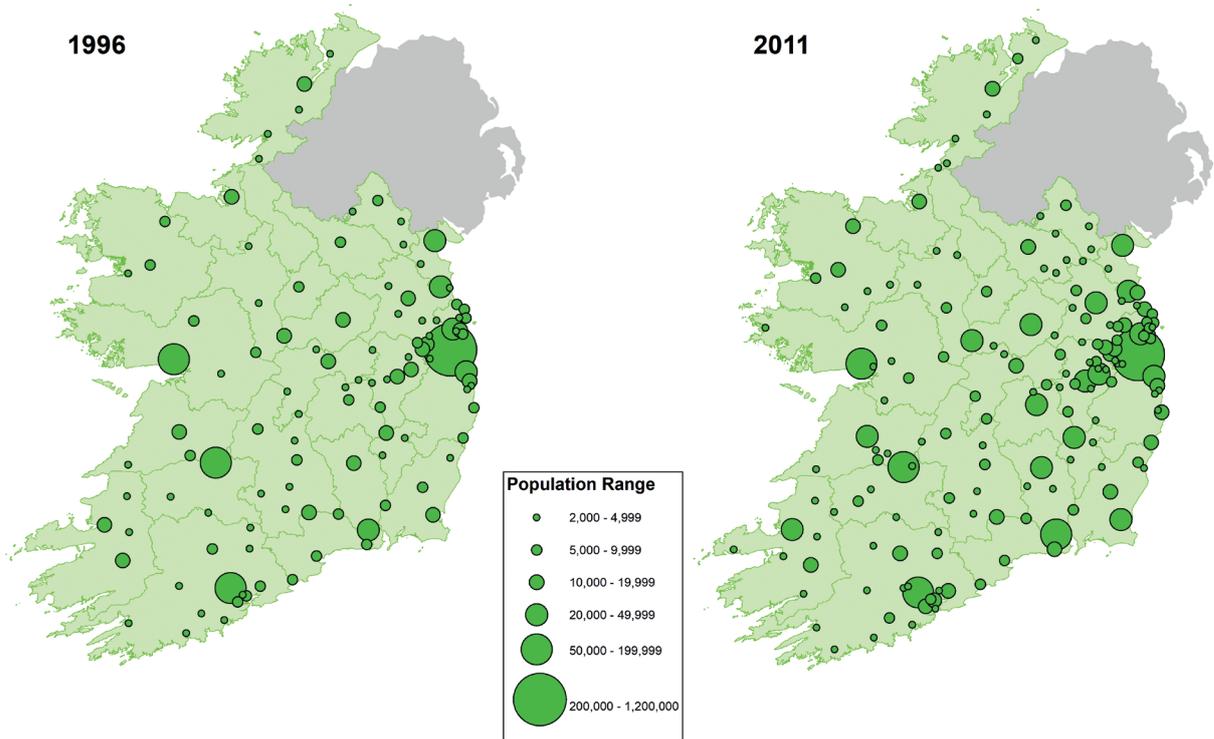
The majority of towns are in the Leinster (13) and Munster (5) regions, with Leinster demonstrating the densest coverage, representing almost half of the urban centres in the country. Only Galway is wholly located in Connaught (Athlone is only partially in Connaught, it straddles the River Shannon which acts as a border between Leinster and Connaught) while there is a distinct absence of any larger centre in the counties of Ulster. The absence of any large centres in the Ulster area of the Republic of Ireland can be largely explained by the creation of the nearby border with Northern Ireland, which artificially altered traditional hinterlands and interrupted linkages between local places. Just over the border in Northern

Ireland in places like Derry, Enniskillen and Newry large urban centres are partially cut off from their traditional hinterlands in nearby parts of the Republic of Ireland, thus leaving the Republic side of the border region bereft of a large urban centre. The absence of large urban centres, in part, explains the relatively weak economic performance of the border region and the lack of either large or rapidly growing urban centres is obvious in Figures 1-3. This economic weakness also explains why the Borders, Midlands and West sub-national region was designated in the late 1990s as it clearly was not benefitting to the same extent as the remainder of Celtic Tiger Ireland.

Figure 1 utilises the data from Table 1 to highlight the spatial distribution and population sizes of urban centres in 1996 and 2011. Arguably the most visually striking difference between the two maps is the growing number of places in the 20,000 inhabitants plus range – particularly 'County Towns' like Navan, Mullingar, Athlone, Ennis, Tralee, Kilkenny, Wexford, Carlow, Port Laoise – while once again an absence of places in this category stands out in the northern and western parts of the country. There was a threefold increase in the number of urban centres in the 20,000+ size range – greater than in any other city size bracket. Despite the growth of those centres it is urban centres further down the urban hierarchy which grew at the most rapid rates. In fact, the final column of Table 1 demonstrates a clear inverse relationship between urban size and rate of growth.

**TABLE 2**  
Population of 20 Largest Centres in 2011  
Source: *Central Statistics Office site*

Centre	Region	Type	2011 Population
Dublin	Leinster	Metro	1110627
Cork	Munster	Metro	198582
Limerick	Munster	Metro	91454
Galway	Connaught	Metro	76778
Waterford	Munster	Metro	51519
Drogheda	Leinster	Free	38578
Dundalk	Leinster	Free	37816
Swords	Leinster	Conurb	36924
Bray	Leinster	Conurb	31872
Navan	Leinster	Free	28559
Ennis	Munster	Free	25360
Kilkenny	Leinster	Free	24423
Tralee	Munster	Free	23693
Carlow	Leinster	Free	23030
Droichead Nua	Leinster	Free	21561
Naas	Leinster	Free	20713
Athlone	Leinster/Connaught	Free	20153
Portlaoise	Leinster	Free	20145
Mullingar	Leinster	Free	20103
Wexford	Leinster	Free	20072



**FIGURE 1**  
The Irish Urban System 1996–2011  
Urban Settlements with Population >2,000  
Source: *Central Statistics Office site*

In addition to having the greatest number and densest network of urban centres, Leinster also boasts the highest rates of growth over the 15 year period. The growth rate was higher in the urban centres of Connaught than Munster and Ulster, but considering it was already observed that growth was greatest further down the hierarchy, this should not be surprising. Growth based on urban typology makes it clear that the metro centres were the slowest growing while towns in the orbit of the conurbations of the five metro areas were growing to the greatest extent. In the rapid growth of smaller settlements. Allied to the facts above it appears smaller places in the urban realms of the 5 largest metropolitan centres had the fastest rates of growth, confirming previous suggestions of the role of counter-urbanisation (Gkartzios & Scott 2010). The 25 urban centres that make up the conurbation category grew by 67% in the 15 years under investigation. However, the freestanding urban centres were not too far behind with a growth rate of 60% over the same period.

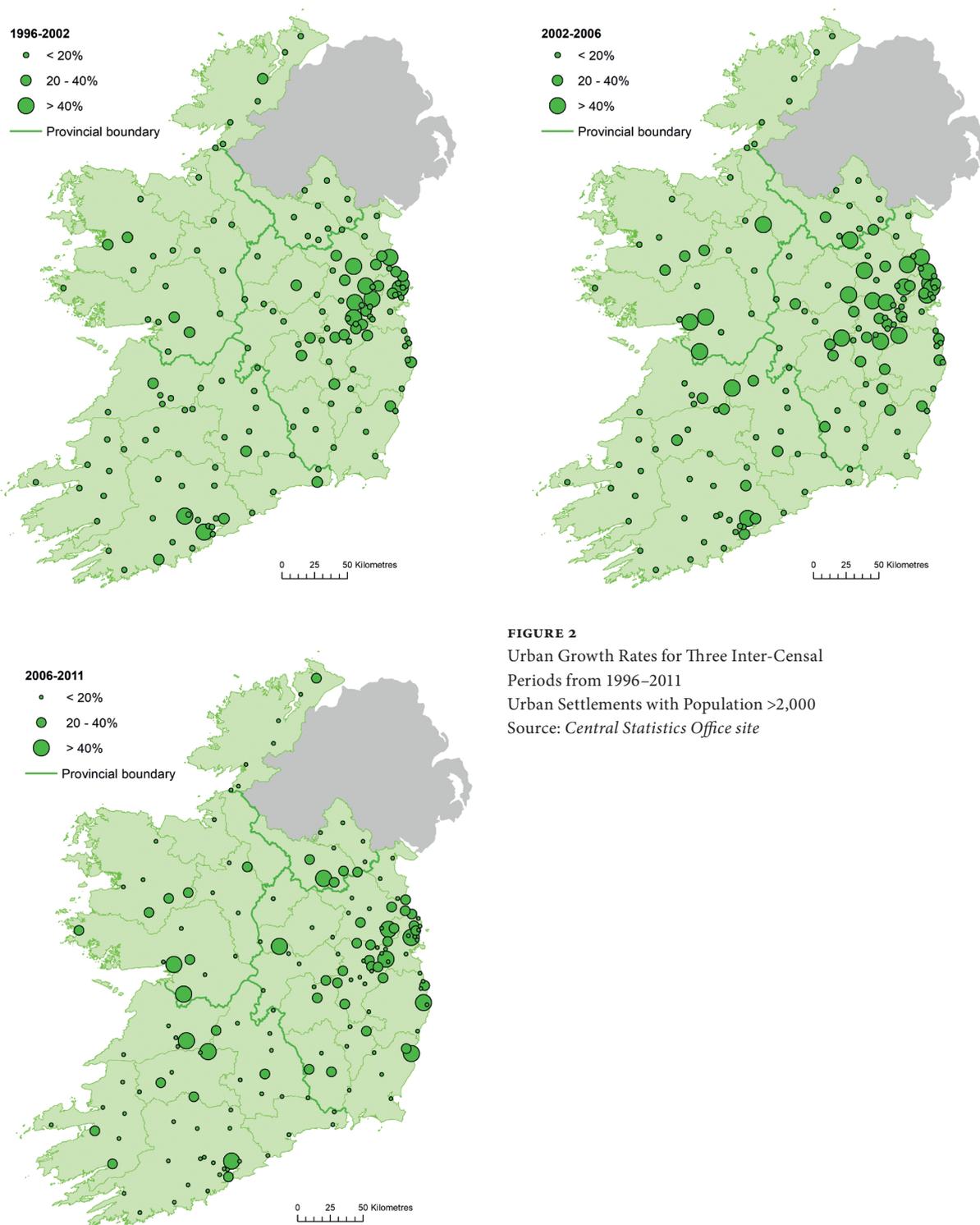
Table 1 also identifies subtle changes across the inter-censal periods. For most size ranges it was the earlier period from 1996 to 2002, as the Celtic Tiger was gaining momentum, which grew the fastest. There were two exceptions: firstly, the smallest size range – those places

between 2,000 and 4,999 inhabitants – had by far the highest rate of growth in the period from 2002–2006, while Dublin grew at the fastest rate in the 2006–2011 period while the other metro centres' growth slowed considerably. Examining city type – the freestanding places grew most rapidly in the early years but it was the conurbation type places that dominated growth in the 2002–2006 and 2006–2011 periods. Now that the key trends and patterns of city size, location and typology relative to urban system change have been identified, it is time to try to take a more systemic view to evaluate the overall picture and attempt to make sense of, or even understand, how the urban system evolved.

### Evolution of the Irish Urban System

The changes described by the data in Table 1 to take on a different feel when visualised in Figure 2. The exploration of the change over time across distinct periods allows one to better understand the overall change identified in Figure 1. Comparing the three maps in Figure 2 the focus is now on rates of change across the spatial distribution – not size.

The most striking aspect of growth rates from 1996 to 2002 is the very prominent cluster of rapidly growing urban centres to the North and West of Dublin, within the county of



**FIGURE 2**  
Urban Growth Rates for Three Inter-Censal  
Periods from 1996–2011  
Urban Settlements with Population >2,000  
Source: *Central Statistics Office site*

Dublin itself, but spilling over into the nearby counties of Louth, Meath and Kildare – towns like Swords, Drogheda, Navan, Newbridge and Naas being the main beneficiaries of increasing population in a belt approximately 40 km from Dublin. Some of these locations were compared to American style edge cities and collectively given the name ‘commuterland’ (McDonald 2002). The only other locations with such rapid rates of growth were found amongst parts of

the conurbation around Cork in the far south of the country, e.g. the town of Carrigaline.

From 2002–2006 the area of most rapid growth diffuses outwards from the primary cluster identified in the previous period. There are four main observations to make here. Firstly, the areas that grew most rapidly initially were still growing rapidly - particularly in north county Dublin in towns like Balbriggan and Rush, and in counties Louth, Meath and

Kildare in towns such as Bettystown, Laytown, Duleek, Ashbourne and Sallins – but just not as fast as some other areas. Secondly, the area of most rapid growth has migrated to the west and southwest of the original cluster with urban centres like Enfield, Kilcock, Kinneagad, Blessington, Athy and Kilcullen displaying very rapid rates of growth – some even doubling in population in the four-year inter-censal period and to some extent reflecting improving transport infrastructure and the impact of new motorway development. Thirdly, and more generally, there appeared to be a more widespread increase in growth rates across a wider distribution of places nationally, these types of trends were observed, not quite to the same extent in earlier periods (Horner & Daultrey 1980). Each of these trends can be linked to a continued dispersal outwards from Dublin, and at increasing distances, as a response to diseconomies that were emerging in the greater Dublin city-region.

From 2006–2011 further shifts in where the rapid growth was taking place are evident. The most obvious being the much wider dispersal of rapid growth in centres across the country. For the first time there is evidence of rapid growth moving further northward into some of the urban centres in the Ulster counties with towns such as Cavan and Kingscourt featuring amongst the most rapidly growing centres. One striking element to take from the third map in Figure 2 is the line of rapidly growing centres on an axis from Cork, through Limerick towards Galway. The fast growth centres in this case, places like Carrigtwohill, Sixmilebridge and Tuam are all places that would be directly linked to the commuting field for one of those three cities forming the axis (ranked 2, 3 and 4 respectively in the urban hierarchy). A third observation is that some fast-growing centres appear along the east coast south of Dublin extending as far south as Gorey and Courtown Harbour.

A final observation for this period is the fact that it straddles the global economic crisis of 2008 which brings the economic boom of the Celtic Tiger years to a grinding halt. That there was still growth recorded over this period is quite interesting, but also hard to reconcile and fully understand without being able to explore annual change – which is not possible with census data of the nature used herein. It is obvious when looking at the rates of growth for this period – they are lower across the board – that most of the growth must have taken place in the first couple of years of the period – as there was very little if any growth after 2008 as the property bubble, that had fuelled much of the growth over the previous Celtic Tiger years, burst. One particular reminder of the boom years during the subsequent post-crash years was the widespread presence of ‘ghost estates’ on the Irish urban

landscape which have been well documented elsewhere (Kitchin, O’Callaghan & Gleeson 2014). Based on the empirical evidence put forward it would seem to make sense to summarise systemic change over the whole period and move towards the development of a model of urban system evolution in a high growth environment.

### Towards a Model of Urban System Evolution under conditions of rapid economic growth

Evidence provided thus far for population change in the Irish Urban System suggests a number of geographical processes are shaping the system over time. While specific details are unique to the Irish example, extracting the varied elements for consideration, or for comparative purposes - taking up the challenge to ‘theorize the urban’ (Robinson 2015) recognises that particular time-lines, growth trajectories and aspects of spatial distribution are indicative of, and strongly linked to, rapid economic growth (as experienced in the Celtic Tiger era). This theorizing permits construction of a model based on universal processes of urban change. Most models of urban system change begin with early phases of urbanisation and issues of development (Geyer 1996; Geyer & Kontuly 2008), not with well-established urban systems in a developed country. This contrast makes this model different in that it should be applied only under conditions of rapid economic growth in relatively well advanced or emerging economies. As such it may prove transferable in understanding or preparing for rapid urban system change elsewhere.

Figure 3 visualises the evolution of growth over time by distinguishing discrete zones linked to the most rapid rates of urban growth within the urban system over the specific periods discussed in the previous section. Zones of most rapid growth are superimposed over the growth rates for each urban centre from 1996 to 2011. The identification of these distinct zones based on the changes described in the previous section, allows one to summarise the key trends over time and how as an urban system there was an evolution in the spatial pattern.

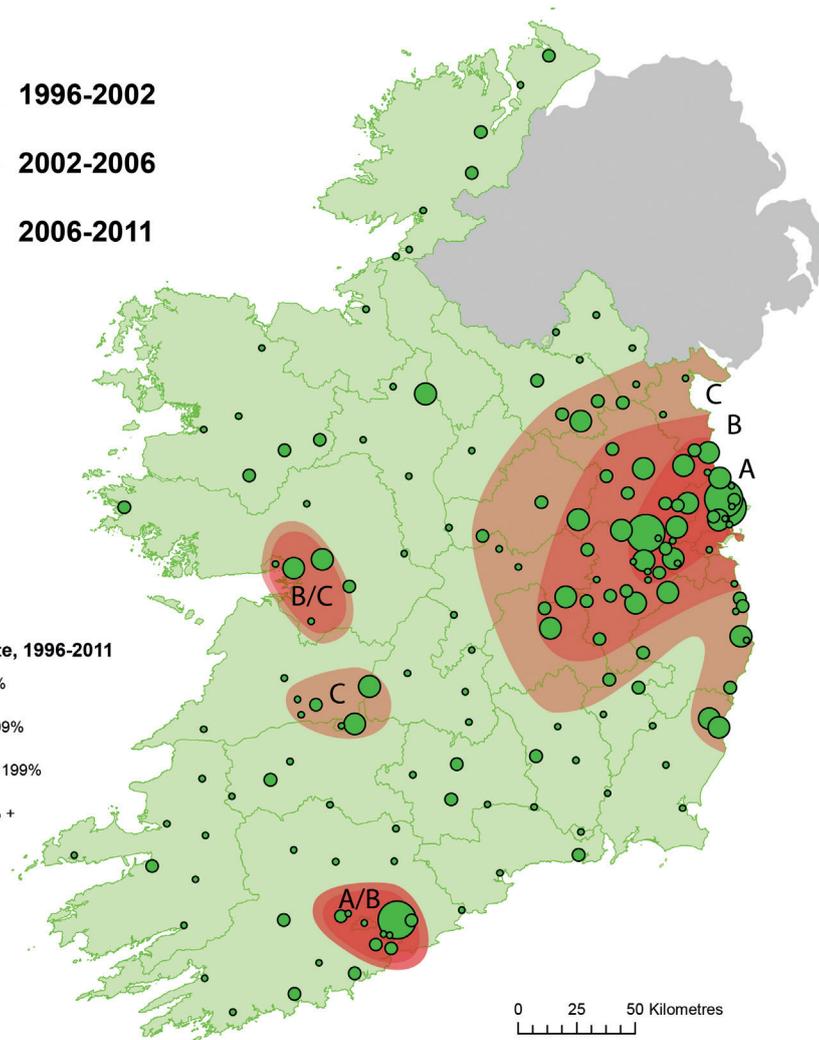
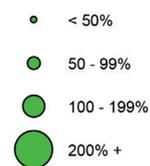
Initially what is found is a rapid development and growth of towns and cities on Dublin’s northern and western fringes – in essence, places were being subsumed into what has become known as the Greater Dublin Area (Murphy 2009). Cork, the second city in the urban system, also showed some evidence of limited growth in some of its satellite towns, places which had shown some evidence of growth previously (Hourihan 1983). In both examples there is compelling evidence for the role of the twin processes of globalisation and Foreign Direct Investment in promoting urban growth of the Dublin city-region (Sokol, Van Egarat & Williams 2008;

**Zone A 1996-2002**

**Zone B 2002-2006**

**Zone C 2006-2011**

**Growth Rate, 1996-2011**



**FIGURE 3**  
Evolution of the  
Irish System  
1996–2011  
Urban Settlements  
with Population  
>2,000  
Source: *Central  
Statistics Office site*

Sokol 2011) and Cork (Counsell, Haughton & Allmendinger 2014). This strong link to foreign investment is usually attributed as one of the main reasons for the emergence of the Celtic Tiger (Breathnach 1998).

As time passed and economic growth continued apace new processes linked to increasing urbanisation, metropolisation, suburbanisation, counter-urbanisation and diffusion emerged. The area of most rapid growth expanded and there was dispersal of population outwards from Dublin, particularly to towns along the emerging motorway system, this was not new as the influence of transport on urban growth had been identified previously in the Irish context (Cawley 1990) but with the new motorways the increased volume of traffic and potential for increasing size of urban areas increased dramatically. Due to increasing diseconomies of scale in the Capital and the high costs encountered in the Dublin property market long distance commuting into Dublin

increased to distances some considered unsustainable (Williams & Shiels 2000). There was continued rapid growth around the Cork and Galway metro regions. Simultaneously there was rapid and ongoing growth in the larger centres particularly at the lower end of the hierarchy – reflecting that growth was almost universal in all parts of the urban system, albeit most rapid in the smaller places – particularly those that might be considered satellites to larger places higher up the urban hierarchy. Of the urban centres with a population over 2,000 inhabitants only 4 of the 159 surveyed displayed a decline between 1996 and 2011; these were Ballyshannon, Clones, Templemore and Newtownmountkennedy. From a policy perspective some of the dispersal of the growth might be an outcome of policies contained in the new National Spatial Strategy which came into force in 2002.

The final phase highlighted a relative slowing down of growth in the Greater Dublin

**TABLE 3**  
Correlation Growth Rate vs Distance (Pearson)  
Source: Central Statistics Office

n=135	Growth	Growth	Growth	Growth
	1996-2002	2002-2006	2006-2011	1996-2011
Distance to Dublin	<b>-0.214</b>	<b><i>-0.256</i></b>	-0.155	<b><i>-0.359</i></b>
Distance to nearest Metro	<b>-0.178</b>	<b><i>-0.181</i></b>	-0.02	-0.145

bold – significant at 0.05, italics – significant at 0.01

Area compared to other parts of the country, the areas of most rapid growth had now dispersed to a much greater distance from Dublin and a clear axis of rapid growth seemed to be emerging in what might be described as a western corridor extending from Cork to Galway. It was apparent that distance from Dublin effects urban growth patterns and this relationship is explored in Table 3. This trend was observed in an earlier period (Lutz 2001) and seemed worthy of replication. The results of the correlation support a statistically significant link between the distance from Dublin or from any other Metro area corresponding to distinct phases of growth. There is a clear negative correlation which highlights the fact that growth was slower the further one travelled from Dublin or from the other Metro areas, but the influence of Dublin carried much more weight as a function of its primacy in the urban hierarchy. That relationship became weaker in the final period investigated which would suggest more rapid growth at a distance from Dublin which is supported by the empirical evidence provided already.

Based on the empirical evidence from the analysis of the Irish Urban System a model of urban system evolution under conditions of rapid growth is now proposed.

### The Model

Stage 1 is marked by a dramatic growth and rapid urban growth around the primate city and growth strongly related to flows of inward investment (Sokol 2011) due to the benefits of agglomeration and urbanisation economies. This growth will express itself through urban sprawl, edge city type formations, and the growth of nearby smaller towns and villages as they fall under the sphere of influence of the primate city. There will be rapid growth in the larger urban centres within the commuting radius from the largest city with a likelihood of similar processes beginning – but to a lesser extent – in the next ranked city in the urban hierarchy.

Stage 2 is marked by an increasing dispersal of the zone of most rapid growth further away from the primate city - perhaps the result of an expanding commuter field – a general shift of growth down the urban hierarchy as more places start to share the benefits of the rapid economic development and the benefits of improving

transport infrastructure. This stage is the start of a ripple or wave outward from the initial core region.

Stage 3 is marked by a further dispersal of the area of most rapid growth, both spatially and down the urban hierarchy. There appears to be potential for an alternative axis, or rival to the primate core region to emerge as growth may leapfrog the primate region to other metropolitan areas creating an addition pattern of diffusion. This will of course depend on place-specific spatial arrangements, regulations or policies. Over time there is a clear pattern of a ripple effect as the benefits of economic growth spread, but not all areas seem to benefit equally, as more peripheral areas may not be reached, and this is where policy becomes so important to the direction the model takes in its latter stages.

Stage 4, the final stage, is left open enabling numerous hypothetical outcomes dependent on future developments that may or may not be foreseeable. There are a variety of possible trajectories. Firstly, a crisis or external shock may stop growth in its tracks and may be either temporary or longer term depending on the nature of the shock. Secondly, growth may just slow down naturally as the economy matures with little change in the urban hierarchy and a smooth transition to a post-growth environment. Thirdly, regulatory or policy regimes may change inducing a paradigm shift that alters the urban system dynamic to some unknown or unpredictable state.

### Conclusion

The initial intent behind this research was an interest in changes in the Irish Urban System. The idea was to update some of the previous explorations of the urban system which seemed to have decreased in number since the millennium. There was no intention to attempt to create a model. However, as the analysis was conducted and the changes were mapped some striking spatial patterns emerged. It became apparent that the set of circumstances driving economic change during the Celtic Tiger years may not be unique, and that lessons might be learned for the future. A wide range of urban processes were visible at the localised level but these also required exploration at the macro or urban system scale. It became obvious over time that a sequence of events was unfolding across

the map of Ireland as if a tsunami was spreading outward from its epicentre in Dublin, and not just in a contiguous fashion. Strong spatial patterns are visible and discussed in the context of previous research but also in the context of rapid economic growth. There was a strong core-periphery effect visible with patterns of growth and spatial distribution that highlighted inequalities in the system; the result being that some regions trailed behind with weakly developed urban structures. Despite the emergence of a new axis of growth in the west – this needs to be expanded northward to bring benefits to the north west and further develop its sub-regional urban system. Future policy needs to target and promote these places above all others to bring about more balance to the economy and the urban system. Completion of an Atlantic Arc motorway from Galway via Sligo to Letterkenny and on to Derry – expanding northwards from the incipient secondary growth axis – would seem to be the most obvious infrastructural development required. As a small country, decisions for inward investment are less likely now to be impacted by distance as connectivity between centres improves dramatically – something which should benefit all regions of the country, and certainly something to keep an eye on for the future.

Looking to that future there are numerous avenues for further urban systems research in Ireland. Subsequent years have seen the Irish economy start to grow rapidly again and there are new data sets available for 2016

enabling further exploration of themes related to the economic crisis, spatial patterns and the urban hierarchy. Other avenues for further research certainly exist in terms of an all-island, all-Ireland urban system, an analysis which might be both comparative and integrative concurrently – alas this must wait until the results of the 2021 Census in Northern Ireland are released. The obvious question that will need to be answered is how will the Irish Urban System respond to a post-Celtic Tiger era, and will lessons from that period prove useful to planners and policy makers in Ireland or further abroad. Finally, the nature of future relations between the UK and the EU following Brexit, and its final resolution, possesses the possibility to transform the very nature of the Irish Urban System.

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