

## **CUMULATIVE CAUSATION REVISITED IN THE CONTEXT OF CONTEMPORARY SOUTHEAST QUEENSLAND ECONOMIC REGIONAL DEVELOPMENT: CONGRUENCE OR DIVERGENCE?**

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**ABSTRACT:** The Swedish economist, Gunnar Myrdal, first postulated his Cumulative Causation Theory (CCT) in the mid-1950s. It presented a multi-cause explanation for differential growth and regional development patterns. Within any such region, it predicted the likely emergence of one activity node that would dominate the long-term economic, political and community character of the entire area. In the intervening period, the theory has been widely adopted as a reasonable explanation of growth and development patterns across many western countries. However, given the scale and compounding nature of contemporary change, it is reasonable to reconsider its current relevance and impact. This paper forms part of a wider, continuing study into the development of Australian regions and businesses within rapidly changing environments. That reflects on both Cumulative Causation Theory (CCT) and on the appropriate role of government in such matters into the future. The paper draws on examples from sub-regions within South East Queensland. Although these sub-regions are diverse in physical characteristics and economic structures, this paper observes that key elements of CCT still resonate. It is hoped that this research will assist government in the formation of better targeted regional support into the future.

**KEYWORDS:** Australia; regional economic development; Myrdal's theory; contemporary application; South East Queensland.

## 1. INTRODUCTION

The Swedish economist, Gunnar Myrdal, first postulated his Cumulative Causation Theory (CCT) in the mid-1950s. It presented a multi-cause explanation for differential growth and regional development patterns. Within any such region, it predicted the likely emergence of one activity node that would dominate the long-term economic, political and community character of the entire area.

The approach appears to have remained relevant, particularly in places such as Australia where private capital investment has typically led urban development under ‘green field’ conditions. Critics may consider that such a theory simply reflects the truism that ‘investment and development beget investment and development’. It may also be argued that contemporary development drivers are much too complex and diverse to draw such direct links.

This paper forms part of a wide study into the economic evolution of firms and sectors within Australian regions and the role that government can best play in supporting positive and sustainable growth. This component, based on work in parts of south-east Queensland, seeks to assess the overall relevance of a Cumulation Causation model in those locations, both historically and in the contemporary environment. It is planned that this primary work will lead to a wider investigation into the economic evolution of this broad region and its realignment within a now quite different environment.

Over the decades, practically all students of urban economics and regional development commenced their studies with a substantial array of theories and concepts. These included the classical foundations provided by Malthus and Ricardo, the social observation of Mill and through to the later work of Marshall and Keynes where the mainstream leaned towards the economics side of the spectrum. Myrdal’s Cumulative Causation Theory (CCT) represented an interesting addition to this suite of theories, in part because of its apparent manifestation across many regions, its adaptability to a range of diverse applications and migratory patterns (Fussell and Massey, 2004) and, finally, the identification of sources of innovation that emerged through such processes (Bamberry, 2010).

Notwithstanding the significant passage of time since their initial publication, each of these theories contributed some valuable observation on how land resources, either as individual holdings or aggregated into towns or regions, may be used in an optimum and sustainable way.

Increasingly, and in line with the growing complexity of regional and development environments, there has been a general trend away from

single concepts and historical perspectives and towards more dynamic and multi-factorial approaches, emphasising non-economic as well as economic variables (Hubacek *et al.*, 2006). Myrdal's Circular Model of Cumulative Causation represented one such multi-factorial explanation of differential growth. While first presented as a coherent theory in the mid-1950's, its academic roots extend back to the turn of that century (Bambray, 2016). It appeared to be useful both in the analysis of growth patterns between regions and also, helped to explain the success of some localities/places over other localities within that same region. This approach appeared to reasonably reflect regional growth patterns across much of Australia where most, past urban and regional development have been driven by private sector decision-making, much in 'greenfield' environments. Historically too, many regions across Australia developed 'hotspot' activity nodes that grew disproportionately when compared with their surrounding regions/catchments, apparently following the path Myrdal had predicted.

All of this is not to imply that the theory has been without its critics who suggested that, at its essence, it was simply stating the fairly obvious observation that 'development and investment in a region tends to create its own momentum'. Nevertheless, CCT continues to be respected as a legitimate proposition applicable to a range of economic, social and other scenarios and, notably, to regional development (Argyros *et al.*, 2009). The basic concepts here are relatively simple but that should not imply a criticism of their value.

Given the significant and compounding economic, social, demographic, governmental and development changes across Australian regions since this theory was first proposed, it is reasonable to question whether the growth patterns predicted by CCT remain evident today. In other words, has the theory proved to be resilient through periods of such significant change?

As with any major stakeholder, governments have typically been drawn towards existing investments, sectors and population concentrations. Consequently, their past actions and policies have generally reinforced the CCT model.

Because of the relatively short political tenure of Australian governments, planning horizons are often limited and their need for measurable change is almost immediate. Consequently, and particularly over recent decades, there have been both subtle and overt interventions by government in an attempt to influence longer-term regional development and business structures. These potentially disturb the patterns typical of

CCT. A key, subsequent question, then, is whether these recent government interventions, such as ‘innovation programs’ and support for early stage, ‘sunrise’ enterprises, are of sustainable impact or simply represent aberrations in underlying CCT evolution.

The paper further considers a number of the recognised key drivers for change that have emerged across Australian regions over recent years and the extent to which they may have affected and modified the CCT model. Of particular note is the quite limited demographic change in many regional areas that lie outside certain (generally coastal) locations or outside existing peri-urban clusters.

Corona Virus Disease-2019 (COVID-19), as a persistent global-level shock, did succeed where governments did not, in slowing the general drain of regional populations to Australia’s major urban centres. (Borsellino *et al.*, 2022). However, the generally disappointing growth performance in those, more remote, areas belie spending efforts by all levels of government in Australia to attract novel, sustainable investment to such regions.

Certainly, trends over recent decades may call into question the ease of ‘technical decentralisation’ which seems to be the premise of much current regional development policy. Unfortunately, and perhaps significantly, there appear to be practically no longitudinal impact reports on such policies and government support anywhere in Australia. The point here is that the predicted evolution of regional CCT seems to reflect more pervasive trends than many short-term, politically driven government, sectoral growth strategies.

Given the dynamic nature and rate of change underway across all of Australia’s regions, it is of value to revisit Myrdal’s theory, over 70 years since its initial publication, to explore its ongoing relevance in explaining contemporary growth and development patterns. That extended timeframe allows the identification of reliable trends rather than, for example, placing emphasis on populist, but still largely unproven, support for ‘start-up’ and other early stage ventures (Atherton, 2006).

By way of example on that point, Coad and Storey’s (2021) wide analysis concludes that, after heavy investment by government in innovation programs, there is a lack of obvious evidence of substantive value. Such research empirically demonstrates that a range of external and esoteric forces and, indeed, chance are much more important to early stage investment and business success than government interventions. Perhaps more respect for, and leverage from, long-term regional growth patterns (such as those postulated under CCT) would improve firm and regional growth rather than the fairly eclectic support for firms based largely on

their business model, state of development or some particular interface with information and communication technology (ICT).

### ***Cumulative Causation, Regional Growth and Spatial Form***

Myrdal's CCT approach recognised that a simple, linear consideration of economic development, presuming sequential or direct, causal links between components, failed to adequately describe the inherent complexity of regional growth played out in a particular region or location. Rather, Myrdal considered that growth, say in a progressive region, tended to follow a self-reinforcing, compounding process with further changes/advances likely to occur in the same direction and aggregating human, financial and institutional resources and infrastructure at a far greater rate than other, surrounding areas. Of course, the reverse could also be the case, which would help explain the 'spiral down' that typically occurs in regions as they decline (Butler-Bowdon, 2017).

Though CCT has been applied across a range of socio-economic environments, both internationally and in the Australian context, it can be well used to explain and understand spatial regional and urban forms. In practice, Myrdal (and later Kaldor, 1978) observed that a particular location may, from its earliest establishment, possess some special, sustainable characteristics or advantage – perhaps that feature was a natural harbour, good soils, agreeable climate or abundant water or perhaps a combination of a number of these.

Sometimes that original advantage/advantages may have been quite modest but, whatever these positive attributes, they were sufficient to provide a locational preference for settlement, trade and investment, drawing in resources both from external sources and from the home catchment area. As that process continued, those positive attributes leverage off each other, creating new opportunities and further momentum; hence terms such as 'circular', 'multi-causal' and 'non-equilibrium growth' are often used in describing the model. In parallel, institutional and government investment and services would now be likely to be attracted to that centre of growing importance and population. Free investment capital would also flow increasingly to that location now exhibiting larger scale, more activity and greater potential for higher, more secure, returns.

Almost ironically, the original trigger for the initial 'leap ahead' for that location, may well diminish in importance as the new aggregation grows and evolves further into new and different activities.

Along this development path, too, the large node will benefit from almost invariably being selected as the site for the large public and private investments which are ‘one-only’ for the region. Major universities, research hospitals, transportation hubs, government departments, corporate headquarters and major infrastructure and civic and community facilities are all examples of this aggregation, again widening the gap in capital investment which can now never be replicated in the lesser, surrounding areas. The development patterns of practically all Australian states and the dominant position, economically and politically, of the state capitals compared with the rest of their states, gives credence to that observation.

A further key observation here is that, once that gap has been established between that node and its catchment and surrounding regions, that difference will almost never be reconciled or closed. Consequently, those lesser areas may well suffer and decline as more resources (for example human, investment, know-how and networks) are drawn away to the main node.

There may of course be positive effects (described by Myrdal as ‘back-wash and spread’ impacts) as the surrounding regions find a market for their economic surpluses in that larger centre/node.

In considering a retrospective study such as this, particular care needs to be taken that observations do not become self-serving to support the argument being presented. Taleb (2004) notes that it is human nature, reinforced now by the availability of huge volumes of (often unverified) information, to seek causal relationships and reasons for practically all events. This is particularly problematic in areas such as regional, economic development and physical growth. Here, there is inherent volatility based on the interplay between the unique physical characteristics, micro-economic decision-making and externalities such as overall economic conditions and government policy, all of which contribute to ‘the mosaic’ that is that region.

Again, this highlights the importance of such studies to seek out longer-term, sustainable trends and to accept that there is a considerable element of chance, randomness and coincidence in any such complex and dynamic system (Taleb, 2004).

## **2. METHODOLOGY**

The research base for this paper has been drawn from multiple sources. In the first instance, there has been, for over six decades, considerable academic analysis of CCT and this paper offers a critical review of a range

of key papers from this body of work. Sections of this paper relate particularly to changing business environments for small to medium enterprises (SME's) within those regional economies and are, in part, based on the earlier work of Hefferan and Fern (2018). In addition, the broad support for this work is based on: a comprehensive literature review, statistical investigations of these regions (particularly using Economy id, ABS and other sources) and the records of the local authorities involved, involvement of the authors in the development of economic and growth strategies in these regions extending back over two decades, and long term, candid access to key informants in the regions of focus.

Long-term relationships with key stakeholders in the regions have also assisted with a 'snowball sampling' effect in gathering information over many years, with difficult to access stakeholder opinions key to this research including local government and key regional business leaders.

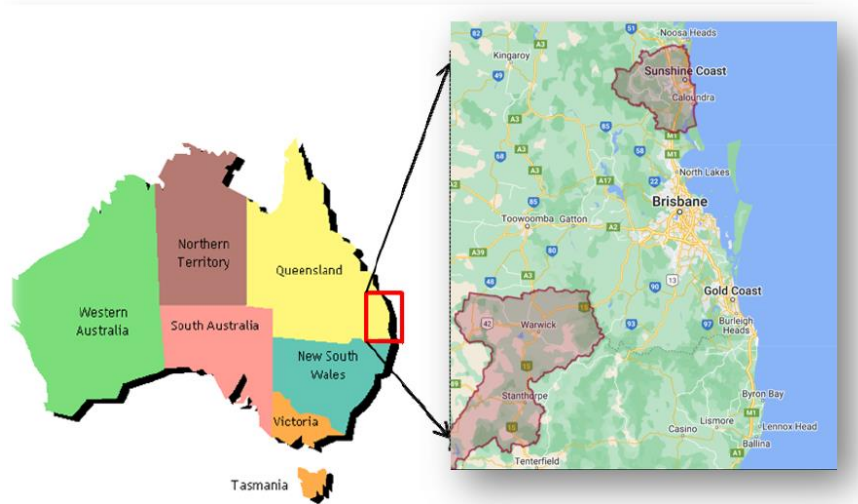
The case studies / sub-regions used are of particular interest to this study as they provide both similarities and contrasts in CCT application. They are situated within the same, general high-growth area of South-East Queensland and are in relatively close proximity to each other. At the same time, they show diversity in other characteristics such as principle economic activity, demography and geography.

### ***Study Areas***

Queensland is Australia's most decentralised state and exhibits quite well-defined regions. As such, it provides an interesting longitudinal study of regional economic development where CCT can be 'tested' against variables observed over time.

To that end, observations and examples in this work are drawn from the greater South-East Queensland (SEQ) area – notably the Sunshine Coast, in the SEQ's north, and the Southern Downs region in the southwest. In this context, cumulative causation may be observed at several levels – the South-Eastern corner of the state in relation to the whole state, and secondly Brisbane city and other 'sub regions' within SEQ.

This area includes the state capital, Brisbane, together with a range of dormitory and close rural areas. Geographic differences between Southern Downs and Sunshine Coast (Figure 1) and a variety of important differences makes comparison very informative.



**Figure 1.** Location of Southern Downs and Sunshine Coast Local Government Areas. Source: Electoral Commission QLD, 2022.

The population of Queensland, in common with other Australian states, is heavily weighted to its state capital and its environs (commonly referred to as ‘SEQ’). The overall area includes population centres ranging from Ipswich, west of Brisbane, to the Sunshine Coast to the north, Gold Coast to the east and Logan to the south. This cluster of areas alone accounts for 3.7 million of the state’s total population of about 5.2 million (idCommunity, 2021). SEQ is also much closer geographically to Sydney and Canberra than to the State’s own far northern regions.

The state was first established (as a penal colony) in 1824 and much of its original growth related to its accessibility to Sydney, the establishment of government administration and later, education and health facilities. Of particular importance also was the establishment of the Queensland rail system (1865), progressively radiating from that south-east corner of the state, and from the associated Brisbane Port.

The discovery of gold in Gympie (1867), Charters Towers (1872), Palmer River (1873) and in other, more remote, locations threatened the primacy of Brisbane as the state capital. However, from inauspicious and slow beginnings, the momentum built up to the point that South-East Queensland (principally Brisbane city and the Gold and Sunshine Coasts immediately to the south and north respectively) now house some 71% of the state’s total population. Other intermediate cities, principally located



along the eastern coastline, are largely service and transport centres to their respective regions/hinterlands (idCommunity, 2021).

SEQ has produced much stronger growth than any other part of the state and, for more than a century, has established precedence over all other nodes. (Second to SEQ is the Townsville region which accommodates only one-fifth of the population of the South-East) (idCommunity, 2021). Financial, educational and medical hubs have become concentrated in the south-east, clustering around the large population base and established access to external markets and other links.

The evolution of financial services in Australia over the past four decades also provides an interesting example of the inter-related, multiple factors at work here supporting aggregation in particular regions. With the concentration of the Australian banking sector since the late 1980s, business surpluses, profits and household savings were now deposited in a very small number of major, national banks. Those deposits may well have been sourced from across all regions; however, through those major financial intermediaries, such funds were most likely to be re-invested in the fast-moving regions, such as in South-East Queensland, so again diverting investment from those lesser regions.

The remarkable growth over recent decades in mineral development, geographically distant to SEQ, appears to have encouraged decentralisation and therefore, may act to counter to the aggregations described above. This, in practice, is less important than it may first appear. While involving huge capital expenditure in the initial phase, most of that is imported from outside the region and, post-commissioning, regional benefits can be quite limited, particularly in the longer term and given the advent of 'fly in – fly out' workforces.

These contemporary developments would therefore suggest that the CCT model remains relevant and important to an understanding of present and likely future, regional growth, even though the economic and wider context is ever-changing and volatile.

Innovation and the willingness of individual firms, sectors and their regions to adapt to change are essential to survival and prosperity. Nevertheless, given the nature of Australian regions, those outcomes appear likely to be based on true and enduring regional comparative advantages and, secondly, around and advancing investment and know-how from existing progressive, lead firms.

In investigating the wider, contemporary relevance of CCT, there is value in considering the various strata/scales of relationships occurring – at a state-wide level (focusing on the aggregated growth of South-East

Queensland vis-à-vis the balance of the state) and, in a second but not unrelated analysis, the sub-regions within the SEQ aggregation.

At that more detailed scale, two sub-regions are provided to exemplify some of the general observations made above.

On the Sunshine Coast, the original settlements were centred around the north-south railway (constructed in the mid 1870's) and, perhaps surprisingly, on the establishment of sidings to be used to procure cedar and other native timbers and, later, to service small farm dairying. Except in some specialist forms, these industries no longer exist (now replaced by the explosive growth in tourism). Nevertheless, the original rail and road spine remains as a key feature of regional layout, despite the fact that the original reasons for their siting have long been lost.

Interstate, international and day-trip tourism has encouraged the evolution of development patterns but is still confined largely to a quite narrow, fifty-kilometre strip of land, running north-south and following the coast and original transportation routes. Topographical features such as near-impenetrable ranges to the west and large areas of flood-prone, coastal plains present the same limitations to development as 150 years ago, now further constrained by large areas of national parks and littoral protection reserves.

By way of a second example here, the Southern Downs/Granite Belt, approximately 250 kilometres from the Brisbane CBD and at the south-western extremity of this larger, South-East Queensland region, also now exhibits quite significant progress and expansion from its traditional economic origins (Harslett, 1980). For over 150 years, the unusual soils, climate and growing conditions provided a competitive advantage in fruit growing, particularly for apples and table grapes. This production and economic base have evolved significantly over a comparatively short time but still along the same general path established from earlier times. That evolution has resulted, among other things, in practically no table grapes now being grown in the region and small crop (particularly vegetable) production now superseding the scale and importance of the region's traditional apple and pear industry (Economy.id, 2020).

Given the increasing demand for fresh fruit and vegetables from growing urban areas within the region and beyond, the Granite Belt has found itself with new competitive advantages based on its horticultural production that is counter-cyclic to other growing regions while also benefiting from rapid road access into Brisbane and to southern markets via the New England Highway, north-south.

In both sub-regions to date, economic development has progressed generally as the CCT model might have suggested, though with local

variations and aberrations. There have been major shifts in production type and, with that, certain specialist infrastructure, both public and private has been rendered obsolete. The growth of relatively cheap, refrigerated road transport has led to the decline of large centralised cold stores and industry concentration around local rail infrastructure. Nevertheless, the fundamental framework and many of the underlying comparative advantages remain evident and critical to prosperity. Core infrastructure - road, water, electricity and ICT (Information and Communication Technology) infrastructure, which provide the basic framework for land use and economic activity remain based on installations and routes established from early settlement.

In this too, it is interesting to also note the proposed re-emergence of investment in railway infrastructure, again often following routes established over a century ago.

Australia's transition to a services-based economy is well recognised and has provided, additional momentum for aggregation of population, employment and investment in state capitals, in this case, Brisbane (Glaeser, 2011; Brugmann, 2009; Montgomery, 2007). Nevertheless, the two study areas here remain generally prosperous, based on - as Polèse (2019) had suggested - inherent and enduring comparative advantages combined with good and timely accessibility to major population centres (i.e. Brisbane and, to a lesser extent, Sydney). While travel times have reduced and road networks and other communication have improved over time, the impression and reality of being 'in close proximity' or being 'easily accessible' to major population centres and markets remain as important key comparative advantages for both the Sunshine Coast and the Southern Downs / Granite Belt as they ever have.

This reflects Myrdal's additional observation that, while component forces may well change and development patterns will continue to evolve, all of this will typically occur broadly within the pre-established comparative advantages, physical frameworks and investment parameters. A further overlay, beyond geographic and economic aspects of regional aggregation, is provided by Crane (2020) and Tuan (1977). These highlight social and community recognition of the growing hub within a region or state - the identification of 'place' that has connotations and perceptions beyond simple geographic location ('space'). These perceptions might include, for example, a general understanding that, compared with surrounding areas, this 'central place' is bigger, has better services and presents better prospects for employment, investment etc. While these perceptions may or may not prove fully justified, in the early development

phases particularly, they become something of self-fulfilling prophecies. Under such a scenario, more people and activities are drawn in and interact, either by design/purpose or simply through random interactions, again adding to the momentum of the place, as Myrdal suggested.

Crane extends that aggregation theme, noting that the rush to urbanisation, experienced worldwide over the past half century, has been mainly concentrated around or added to existing nodes that were already recognised to some extent as centres of knowledge and knowhow and where relevant institutions and funding (particularly government-related support) already existed. These created and fuelled their own multipliers (Moretti, 2013; Mazzucato, 2018). Place identification and community/business cooperation in precincts and clusters, became common, spilling over into entertainment, residential and retail precincts. Typically, they were urban in form, ICT-facilitated and reliant on social capital and networks and any enduring competitive advantages, existing development, infrastructure, and institutions existing and further developing in that node (Florida, 2008).

#### ***Other Forces Potentially Disruptive to the CCT Model***

As described above, the evolution of regional development in South-East Queensland appears to have generally followed the CCT model, despite significant changes in economic activity, sectors and in the scale and types of investment involved. Within that general, region-wide development pattern, however, aberrations arise over time.

Five important, likely variations are identified in this regard and require recognition.

The first notes the rise of knowledge intensive sectors and particularly those related to universities, health facilities and research. These need to be considered in a global, networked environment and do not necessarily have the locational requirements of earlier drivers. As noted by Moretti (2013) and Florida (2008), the locational preferences of such, now important groups typically involved a wide range of criteria. Nevertheless, they do normally require access to government and institutions, capital, specialist skills and centres of population. Particularly in Australia, these components are typically best found within the (few and scattered) capital cities, providing those places with additional advantage and momentum as these 'sunrise' opportunities emerge.

The second observation here is that new challenges are emerging to the existing hierarchy of some of the intermediate sized towns within the region. Due to the combination of a number of factors including wide

access to near-instantaneous communication and use of e-commerce, the increased concentration of government, medical and educational facilities in the major node and generally improved road and transportation systems throughout the region, such towns are increasingly at risk of being bypassed in favour of the central node (in this case, Brisbane).

On that basis too, the changes in production logistics, particularly the effective replacement of rail transport with rapid road transport out of production areas, across both the Sunshine Coast and the Southern Downs, have seen the scaling down of many of the original, small villages, sometimes to their virtual disappearance altogether. Those that have survived (and indeed a number that are prospering again), have succeeded based on finding a new niche in emerging sectors such as tourism and/or in meeting the demands of urban growth extending out from the principal regional centres.

In the Southern Downs region of Queensland, well-established economic activities - meat production and processing (Warwick) and fruit and wine production (Stanthorpe/Granite Belt) - represent core employment nodes. These remain critical to those towns. In Warwick, for example, the export meat processor employs, directly or indirectly, some 500 full time equivalent ('FTE') staff out of a 'city' population of about 15 000 (Economyid, 2022).

Over time, and as envisaged under CCT, significant clustering has developed providing support to those core activities and with multipliers cascading through the wider region. Investigations under this research and across those nodes identify the embedded benefits of those large, long-standing enterprises in creating steady demand for both skilled and semi-skilled labour. In addition, they support a range of both generalist and specialist sub-contractors and service providers, servicing those nodes and the wider community at a higher and more sophisticated level that might have otherwise been the case.

Among those service providers, such an environment provides the confidence to take on new skills and technologies, and, over time, increases the scale of operations, workforce, range of services offered and investment, all as CCT would have envisaged.

A comparable pattern of economic development exists elsewhere in the region. On the Granite Belt, for example, the further development and diversity of production towards large scale horticulture and wine production (and associated tourism) links back to original comparative advantages and land use patterns. There also, the clustering of various

specialist support firms and service providers has added considerable depth to the local economy.

As an aside here, the high levels of specialisation, focusing so heavily on a small number of activities, does hold threats of short or long-term downturns, sectoral change and highlights the continued need for ongoing innovation and re-investment. The recent closures of meatworks in close proximity to the Southern Downs attest to this vulnerability and, as CCT theory suggested, the potential for adverse effects on dependant, local enterprises (i.e. multipliers now acting in reverse).

The third observation that might disrupt the CCT model relates to the supposed role of contemporary ICT networks in overcoming the 'tyranny of distance' and in helping to create 'a level playing field' for all businesses and individuals, regardless of location. This, it was frequently claimed, would help break down the dominance and the aggregated power of the central place created by earlier cumulative causation. Certainly, improved ICT networks assist those less endowed, more remote locations. However, ICT rollout and application varies spatially. The quality of networks and access to the latest systems are almost always better in large, aggregated locations. Consequently, over time, the ICT capacity differences between advanced and lesser areas are likely to increase, not the reverse (Leer, 1999).

Except for the rise in tourism, regional business activity in Queensland remains heavily focused on 'traditional' activities such as agribusiness and mining and the provision of 'retail-level' services to the resident population. Some clustering of new 'sunrise' or ICT-specific firms exists in Brisbane and the Gold Coast, particularly around their universities and major health facilities. Across the balance of the study areas here, however, there is minimal evidence of that clustering being replicated across the state and, in fact, there has been a marked lack of success to date of any such ventures attempted in those other locations. This is despite the much promoted advantages of dealing with 'weightless' products and the supposed lack of geographic ties of such enterprises.

The fourth observation is of greater significance and potential disruption to the CCT proposition. That relates to the demographic effect of the ageing baby boomers, now at, or close to, retirement and no longer so locationally bound. This has seen a continuing population drift to 'sunbelt' and similar communities. On the face of it at least, these shifts are not driven by the aggregation forces of cumulative causation. Consequently, disproportionate development activity is emerging in areas away from the central node – the Sunshine Coast providing a particular case in point for this study.

The extent and long-term sustainability of these trends remain to be seen and will be affected by disproportional increases in housing and other costs in those locations. On the face of it, this represents an aberration to the CCT model. However, it is important to note that there are always strong social and service, particularly medical, demands from those baby boomers that will ensure that most such development remains in reasonable proximity to the established node.

Finally, there are the possible disruptive effects of the COVID-19 pandemic and whether such a serious existential threat could radically change this long standing CCT model. COVID-19 has led to an extraordinary increase globally in remote working, at least temporarily breaking the nexus between place and work (e.g. Brynjolfsson *et al.*, 2020). At this time (2022), it is too soon to say with any certainty but already some preliminary observations can be made regarding regional development and growth. Certainly, some impacts will prove transitory, however, it is clear that white collar, urban work can increasingly be disconnected from place in ways that (for example) primary production cannot.

It may well be that the pandemic becomes a catalyst for more people (particularly those without strong, existing locational connections) to reconsider their future locational preferences; however, many of those deliberations, particularly related to the baby boomer cohort approaching retirement, have been underway for a decade or more in any case. People live where they live for a number of significant reasons - employment, social networks, available services etc. - and those links are not easily broken. As noted earlier, the coincidence or sequential occurrence of events does not prove causality. Of interest, however, is longitudinal data from the US for example that suggests that, of those employed pre-COVID, over one third switched to substantially working from home, with younger people particularly likely to make the switch (Brynjolfsson *et al.*, 2020).

While in no way to understate the seriousness of the pandemic, it needs to be recognised that it will be some years before its wide impact on and implications for urbanisation and regional development are appreciated and whether that will facilitate significant changes in long established CCT patterns. Suffices to say, however, the existing fixed investment in, and the inherent strength of, dominant geographic nodes will not be easily changed in an advanced, complex business and social environment such as that in Australia.

### ***Change in Regional Business Structures***

As well as those disruptive forces identified above, particular mention needs to be made on the changing business structures that have emerged and evolved since Myrdal's theory was first published and, particularly, whether that had spatial relevance to business and economic activity and structures in Australian regions.

Unique to Australia, the industrial revolution actually preceded any significant regional development and even, in fact, occurred prior to full exploration. This allowed key nodes (later to become the state capitals and a limited number of larger, regional centres in a manner not significantly impeded by pre-industrial development and investment. The state capitals were in a sense chosen for fairly 'traditional' reasons: ease of access to water sources, amenable climate and soil climate and bays that offered protection of ships from the open sea (Konvitz, 2020). Within each region too, spatial development tended to be fairly uniform given the highly specialised (normally agricultural) production in each area. Supplies of agricultural produce, pre-refrigeration, had to be in reasonable proximity to the population centres or ports. The resultant development history, particularly in Queensland, does reasonably exhibit the patterns envisaged by Myrdal.

Though disrupted periodically by mineral discoveries and development and, in the case of Townsville, the significant growth of military facilities and personnel, one centre in each of those regions – always on the coast and normally well served by rail, road and port infrastructure – became established as the principal activity centre, effectively linking that region to the rest of the country and the rest of the world. This place acted as an administrative and service centre and as the export point for regional production, but always within a dynamic environment.

The two, specific study areas considered for this research provide examples. In the first, the Sunshine Coast sub-region, was established on a succession of rural enterprises -first timber and then dairying and sugar cane and tobacco – each one relying on rail and road transportation but each eventually failing as soil productivity declined and larger production areas developed elsewhere. In the Southern Downs, early mining ventures (principally gold and tin) disappeared as deposits were depleted but a diverse range of agricultural pursuits, including pastoral activities and fruit-growing well suited to the location, were established from early settlement. These uses were refined overtime and evolved into the development of large-scale vegetable and wine production. Today, there is a prevalence of broadacre farming and livestock production, often as mixed



farming enterprises that have developed to in response market opportunities balanced against environmental limitations such as inconsistency in rainfall and unusual soil type and growing conditions. In both locations, the proximity of the rapidly growing, greater Brisbane area provided immediate and convenient domestic markets for primary production and encouraged, over time, the development of a significant tourism industry. Importantly, for both study areas, the infrastructure and settlements created during those earlier periods has created the physical platform and framework for contemporary development and likely trends into the future.

The links between business activity and the regional and urban form have been obvious enough particularly since the industrial revolution and continuing through to contemporary times (Brugmann, 2009). As experienced across the OECD over the past three decades, business and economic activities and industry structures have evolved significantly based on the advancing information and communication technologies (ICT), globalisation of markets and the rise of smaller scale, ‘knowledge intensive’ activities and businesses. These latter business types typically relied heavily on human capital and, in most cases, were not as locationally bound as were traditionally primary and manufacturing sectors of the past. Spatially, these changes appeared to be most common in certain locations - sometimes involving the development of research clusters, incubators etc. and often in association with existing universities (Moretti, 2013). Their development typically emphasised the importance of human capital and networks and ‘weightless’, knowledge-based activities that tended to be developed off a small to medium enterprise (SME) base.

In both study areas here, small to medium enterprise structures have always dominated and currently represent some 97% of all businesses (Queensland Government, 2021). Given that regional Australia is composed almost exclusively of SME’s, it would be important to establish if this small business environment and much-heralded trend towards ‘start up’ businesses were disruptive to the CCT model described earlier.

A critical component of the ‘new wave’, information and technology-based firms and ‘start ups’, particularly in the US, has been their clustering around universities and similar hubs. The links between universities, new technologies and the establishment of new, firms in leading edge, ‘knowledge intensive’ sectors are well recognized. However, in Australia, 15 of the largest 20 universities are located largely within the six state capitals and Canberra – in itself, a case of cumulative causation. As regards the case study areas of this research, it may reasonably be postulated that

the inner Brisbane area, with its large universities, institutions and established networks, present a much more conducive environment for most start-ups and similar new, free-standing enterprises.

Despite strong government support and some significant, singular successes (Wardner and Ors, 2015), the emergence of new clusters and ‘greenfield’ start-ups in the two study areas have been very limited. There are, however, excellent examples within the region where the larger existing business firms have remained competitive and have grown through the adoption and use of very advanced technologies and systems, often involving external support firms and organisations.

Examples in the meat processing node identified above include better management of feedlots and in meat processing, automation, essential improvements in biosecurity traceability and improved animal welfare. Processors identified the significant new technologies deployed through many of their projects, including the use of robotics to reduce labour and ‘big data’ plans for plant optimisation, condition monitoring of industrial equipment, decision support for cattle acquisition and real-time yield and profitability monitoring. Leading edge technologies such as virtual reality are being actively pursued for training purposes and augmented reality has been investigated for plant maintenance and engineering enhancements. As might be expected higher-level expertise is usually drawn from outside the region, though spill over benefits to local firms in activities as diverse as software adaptation, the use of drones and livestock nutrition management are also reported.

The key observation here, replicated in the horticulture and wine growing nodes of the study area, is that the viability and growth of the regional economy, together with the take up of new technologies, appears to be largely leveraged through the further development of existing major activity nodes, rather than greenfield and/or freestanding, ICT-based activities.

In these case study areas, the evolution of regional growth and development based on early comparative advantages as postulated by Myrdal appears to still have relevance, despite the passage of time and the quite different environment presented by the Australian regions considered under this research.

### **3. CONCLUSION**

It is now almost seven decades since Myrdal’s Cumulation Theory (CCT) was first proposed – long before recent globalisation of supply chains and markets, the ‘knowledge revolution’, the rise of ICT and

financial crises and pandemics as we would understand all of those terms today.

It would therefore be easy to dismiss or at least criticize such theories as now dated, somewhat simplistic and not reflecting the full complexity of contemporary Australian regions.

For all of that, there remain across many regions, identifiable elements of a 'central activity node' that have existed almost from first settlement and appear to have maintained that dominant position despite the physical, economic, political, demographic and community ebbs and flows in the intervening period.

A number of conclusions can be drawn from these observations regarding the growth patterns in South-East Queensland – both in a historical context and through to the current day.

As Schumpeter's theory postulated, the development environment here has indeed been dynamic and driven by factors that evolve and interact differently over time - anything but linear, as waves of economic and demographic change, have impacted regions and their pre-existing frameworks (Schumpeter, 1943).

All things considered and without attempting to force the case studies to suit the theory, CCT remains a sound explanation of the development patterns in the case studies cited within South-East Queensland.

No theory fully reflects the complexity and diverse characteristics of any specific region nor how they might influence final outcomes, particularly in fine grained, local analysis. That would be asking too much; however, the key elements of CCT can be clearly observed. As Myrdal has suggested, 'initial, comparative advantages' recognised from early settlement set into train a continuing aggregation that acted to the advantage of that node but with both positive and negative effects on surrounding areas and catchments.

These continue, as Myrdal suggested, in the same general direction, even though the nature and scale of the region and its sub-regions will continue to evolve over time. Despite those changes, the general hierarchy and locational parameters underpinning the regional layouts have remained reasonably consistent over time.

It is too soon to be definitive as to the final impacts of many of the current challenges to (and indeed, opportunities for) Australian regions. However, given the strength of underlying regional frameworks and of the CCT model over many decades, it may be easy to underestimate the resilience of that model now and into the future and, at the same, overestimate the

importance of current regional challenges until their longer-term impacts (either positive or negative) can be verified and assessed.

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