Long Waves, Lifecycles, and Urban Development: Context for Short-Term Purposeful Action

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1 ABSTRACT

The notion of longue duree introduced by the French social theorist and historian Braudel has been captured by the long wave research of B.J.L. Berry and the product life cycle concept in industrial organization. In all three seminal contributions, social, environmental and economic processes are visible and analyzable in the long run. Processes are characterized in terms of a pattern of rapid growth, followed by a longer period of slow down, towards decline, which could be followed again by a period of rapid growth. Stability in long waves appears to be a function of the ratio of large to small firms, perhaps an indicator of catalyst and sustainable growth. This paper first develops a heuristic model based on long wave theory to analyze spatial changes in metropolitan area growth and change. The model is then applied to two metropolitan regions in the US: the St. Louis metropolitan area, perhaps in early stages of decline and South Florida, perhaps in advanced stages of growth. The final part of the paper is a reflection of the potentials of long wave theory to inform planning practice.

2 INTRODUCTION

The impetus for this paper is twofold: we often forget the past and its ability to focus on "path dependence" and we often forget about the future. Contextually defined change is a fundamental characteristic of cities and regions.

The notion of long waves and urban development is familiar to those focused on the history of transport and its role in development. Many authors (e.g., Kasarda, 2000; Schaafsma, 2008) point to long periods of water transport, rail transport, automobile and truck transport, and air transport. In addition, there are a number of writers who talk about economic transformations (Florida, 1996, Scott, 1988), the most dominant being the change from agricultural to manufacturing to services. Some of these are explicitly tied to technological changes (Graham, 1997, Graham & Marvin, 1999).

These changes do not happen in the short term, and they seem to go through periods or phase transitions. This is what leads to the idea of a lifecycle, as the process seems to repeat itself. The time period over which the changes occur vary, with some occurring over a short time period and others that take over decades or centuries. Planners may indeed have been focusing too much on the shorter periods of change, forsaking the future and not understanding that the events of today will shape the form of tomorrow. The purpose of this paper is to consider longer term change as "context" for the daily grind of most bureaucratic planners. Longer views engender such as questions of "what is a city", "what is urbanism" etc. Our purpose in this paper is to consider such longer-wave thinking to see what it can inform us about both our urban agglomerations and about daily practice.

This paper is organized as follows. The next section reviews seminal ideas about long wave change. From these, a heuristic model of metropolitan area development is created around a small set of key attributes. The heuristic model is then used to describe and compare two metropolitan areas in the United States: St. Louis and South Florida, a pair chosen to arguably and intuitively represent different stages of development in terms of long wave thinking. The final section is a reflection of the methods used and suggestions for using longer view perspectives in daily urban planning practice.

3 BRAUDEL, BERRY AND LIFECYLES

This section reviews three important concepts in long wave thinking. We begin with the seminal work of Fernand Braudel and the Annales approach, identify the work of Brian J.L. Berry and others on long waves, and review the notion of lifecycles both in terms of planning development and in the marketing/consumption of consumer products.

3.1 Braudel

Fernand Braudel greatly influenced the way history is viewed. He and the Annales School of Historiography examined historical events and time periods using a broad approach that incorporated everything from society, from the political structure down to daily life. The approach, generally known as the Longue Duree, emphasized that history should be viewed over the long term, and that events occurred down a path that was rarely deviated from.

Braudel's two more influential works were **La Méditerranée et le Monde Méditerranéen à l'Epoque de Philippe II.** (The Mediterranean and the Mediterranean World in the Age of Philip II) and **Civilisation Matérielle, Economie et Capitalisme, XVe-XVIIIe** (Capitalism and Material Life, 1400-1800). Each one has three volumes that start off on a local scale and build up to a macro view.

The concept of the Longue Duree is introduced in **The Mediterranean** during a discussion about time and time periods. There are three distinctive time periods. The first is that of the environment. The change here is almost unnoticed due to the long amount of time that passes between transformations. The second period is made up of empires, civilizations and society. Change occurs more rapidly but still takes centuries. This is the time period of the Longue Duree, or long waves. Longue Duree is the idea that events or actions take place over a continuum and that there are no real short term events. They do not occur in a vacuum and are products of the social, political and economic environment. The third period is where people and their actions occur.

In **Capitalism**, Braudel deals with the economy and capitalism. Each volume focuses on a different layer of life. Volume one focuses on the daily life of citizens and how they influence the immediate spatial area around them. Volume two focuses on the evolution of commerce starting in the 15th century and how what drove economic progress has changed over time. Volume three is where he really applies the concept of Longue Duree. He first differentiates between the world economy and a world-economy. The world economy is an expression applied to the whole world while a world-economy is a region of the world that is an economically autonomous section of the planet that is self-sufficient and whose "internal links and exchanges give an organic unity" (1979b, 21). It is in his view that these economies have always existed (1979b, 25) and that there are rules associated with them.

3.1.1 Rules

Rule one is a definition of its boundaries. Rule two concerns the power of cities; and is divided into three parts. Rule 2A is that in every world-economy a dominant capitalist city lies at its center. It could not exist if not for the surrounding cities that contribute resources to it. This alpha city also had pronounced social diversification. Rule 2B states that cities take turns leading. Cities are always replacing one another and whenever there is a shift, both the weaknesses of the prior and the strengths of the new system come about. Rule 2C is that the power and influence of cities may vary. This part of the rule is expanded by showing that the earlier alpha cities, based on shipping did not have all the components and were too specialized, which is a reason that they were eventually replaced by Amsterdam and London, since those two cities had a wider economic base and did not rely on one sector to power them.

Rule three concerns the hierarchy of zones within a world economy; and is divided into four parts. Rule 3A is an attempt to explain the separation by using Von Thünen zones. It is a simple model and Braudel criticizes it because it does not include the inherent inequality between the supporting zones and the center city. Rule 3B defines the spatial arrangement of the world-economy. There are three layers that interact at different levels. These are the narrow core, a fairly developed middle zone and a vast periphery. Rule 3C discusses whether or not neutral zones exist and Braudel states that within each zone the socio-economic factors change as one travels through them and the interactions between the factors are unique to each zone. Rule 3D is a conclusion that even though the center of a world economy was fractured it nonetheless was able to have influence out of proportion to its size.

3.1.2 Upside Down Capitalism

Braudel's view on capitalism was different if not unique. Braudel separates the economic spheres into three groups: daily interactions, a market zone, and capitalism (Wallerstein, 1991). The market zone is set aside from the capitalism zone because of how little the profits were and because of how free and open competition was.

The capitalist zone was where the biggest profits and the biggest risks were. There was a lot of concentration in this zone which lead to monopolies and what Braudel calls an antimarket. Capitalists, in his view, try to create monopolies to control the market and he introduces the notion of an enduring company that exists even when power shifts from one world economy to another. Braudel did not view the capitalists as very specialized people. Specialization occurred in the lower levels (Wallerstein, 1991).

3.2 Berry

The notion of long waves in economic development is due to the Russian economist Kondratiev (1925) and introduced into the academic market by Booth (1987, 1986). Berry (1997) summarizes the connection between three concepts that he are central to long wave thinking: techno-economic systems, long waves of prices (Kondratiev waves), and the notion of a growth logistic.

A techno-economic system is the union of technology, resources and infrastructure. The progression from one system to next has been a catalyst for growth. Each system was replaced as new technologies emerged. Each combination has its own infrastructure and shaped the period in which it was found in its own way. The rose and fell in a fairly predictable pattern, going from introduction to market saturation over a period of around 50-60 years. The Kondratiev waves start as low deflationary depressions. These then lead to inflationary growth. They then plunge back down and are then followed by periods of weak recoveries. The whole process bottoms out as the recoveries were not enough to hold off depressionary pressures. This is an ongoing process. Kondratiev waves or supercycles are sinusoidal-like (up and down) periods ranging from forty to sixty years in length. The cycles consist of alternating periods between high sectoral growth and period of relatively slow growth. The Growth Logistic is a decade-wide band of change that follows a half–century–long S shaped path from takeoff in the decade following one lone wave peak, to market saturation in the decade preceding the next peak. This is connected to the exhaustion of market opportunities for the old system and then the search for a new system.

The next wave of information infrastructure is cyberspace. This is the 5th wave; this new telemobility will have consequences in terms of producing increased specialization and concentration of production. Producers are no longer constrained by transportation and transactions cost and they can exploit economies of scale more. The firm becomes more specialized and this results in outsourcing. This varies by industry and also by how feasible it is to switch to a telecommunication heavy business model.

3.3 Lifecycles

3.3.1 Lourenco

Lourenco's (2003) plan-process model identifies waves over time with regard to planning, living and actions. The plan-process model pairs the planning process with development, making the plan the centerpiece of the process, with an emphasis on public input, which she believes allows for more responsible development.

Fantoni and Lourenco (2005) use the plan-process model to understand the lifecycles of tourist areas. Particular time-dependent strategies are shown to stimulate further development of tourist destinations, such as structure, marketing, and good stewardship of the environmental assets.

3.3.2 The S-Curve of Product Adoption

Marketers know the S-Curve from adoption and consumption theory (e.g., Otto & Wood, 1998). Product lifecycles are an established phenomenon of many consumer goods.

When initially released, a new product will take time to become known and established. This is represented by the flat bottom part of the S. The rise in the curve represents new competition in the marketplace and recognition of the new product by more and more consumers. Once the market is saturated by competition and technology has taken the product as far as it can go, the curve begins to flatten once again. The important point is the overall shape of the curve, not its specific representation. Some curves have shorter or longer "bottom" periods and faster or slower "rises".

3.4 Research Problem

The research problem is to use the theory of long waves and lifecycles to first build a heuristic model of city and region growth and then to use it in a comparative analysis of two seemingly different metropolitan areas – St. Louis (rust belt) and South Florida (sun belt). Intuitively, the suspicion is that the St. Louis area is at the top part of the curve while South Florida is in the middle, more vertical, part of the curve.

4   A HEURISTIC BASED ON LONG WAVE THINKING

Here, we compact the above theoretical statements into a heuristic model of urban development. A heuristic is defined as a simple, good enough, hard rules method of problem solving, learning and discovery. Our hope is that the heuristic model will be useful as a tool for understanding stages or phases of cities and regions. The proposed long wave heuristic proposed includes five key elements.

4.1 Diversification of the Economic Base

Braudel's line of progression from Venice, to Antwerp, then Amsterdam and then London and New York, shows the importance of not being too specialized. Diverse economies are better than specialized ones.

There are numerous measures of diversification that could be used to examine economic structure. Here, we use Shannon's (1948) entropy statistic, arguably the most widely used diversity index. Calculation of this statistic at specific intervals shows how diverse a region's economy is. We calculate this statistic for multiple time periods to show how if a region's economy is becoming more or less diversified.

4.2 Established Versus Emerging Companies

There appears to be a correlation between the lifecycles of industries and the lifecycles of regions. The growth of a region is influenced by industries that are in the growth phase, which stimulates economic growth, but also by industries that are in their slow growth or decline phases, retarding growth. The total rate of growth in a region should be stable, i.e. not experiencing decline, if it is able to maintain a combination of established and emerging industries.

To examine this proposition, we arguably use Shift-Share Analysis. Shift-share analysis partitions growth into three components: national growth, sectoral growth, and growth due to local conditions. More specifically, we examine changes from 1991 through 2009.

4.3 Migration

The openness of a city or region is often considered an important factor in its development path. An important factor to overall development in any metropolitan area is the ability to attract population to serve both economic and cultural/social needs.

We will examine both domestic and international migration patterns for the past ten years.

4.4 Education and Human Resource Attainment/Creativity

There are two competing measures of human resource attainment in metropolitan areas: human resource development (Glaesser, 2004) and the creative class hypothesis (e.g., Florida, 2006, 2002). There is considerable debate as to which descriptor is a better indicator of growth and development (e.g., see the arguments in Donegal et al, 2009; Hoyman & Faricy, 2009).

In this paper, we rely on measurements of educational attainment and comparisons of achievement rates, both statically as well as over time (feasible here only for 2000-2009).

4.5 Connectivity

Connectivity is an important factor in the economic growth of a city or region. From the emergence of port cities that linked vast overseas empires, to the creation of rail hubs like Chicago, to the rise of the interstate highway system and highways in general, the mode of connectivity has altered the urban landscape. This connectivity has varied over the long term and has been expressed itself in different ways. Brueckner (2003), Green (2007) Goetz (1992) show the correlation between passenger traffic and urban economic development; more specifically, O'Connor (2003) also shows that passenger traffic may be shifting from global cities to the next tier.

We measure air traffic, both passenger and cargo, starting in 2000.

5   CASE STUDIES

The heuristic model, with its "five significant points of analysis" is employed to compare two metropolitan areas in the US – St. Louis and South Florida, arguably "different" in terms of their development paths. However, prior to this analysis, we briefly review some general socio-economic and geographic features. Figure 1 is a map view of the two geographical areas, shown at the same scale. Figure 2 is an overview of selected statistics for these two regions.
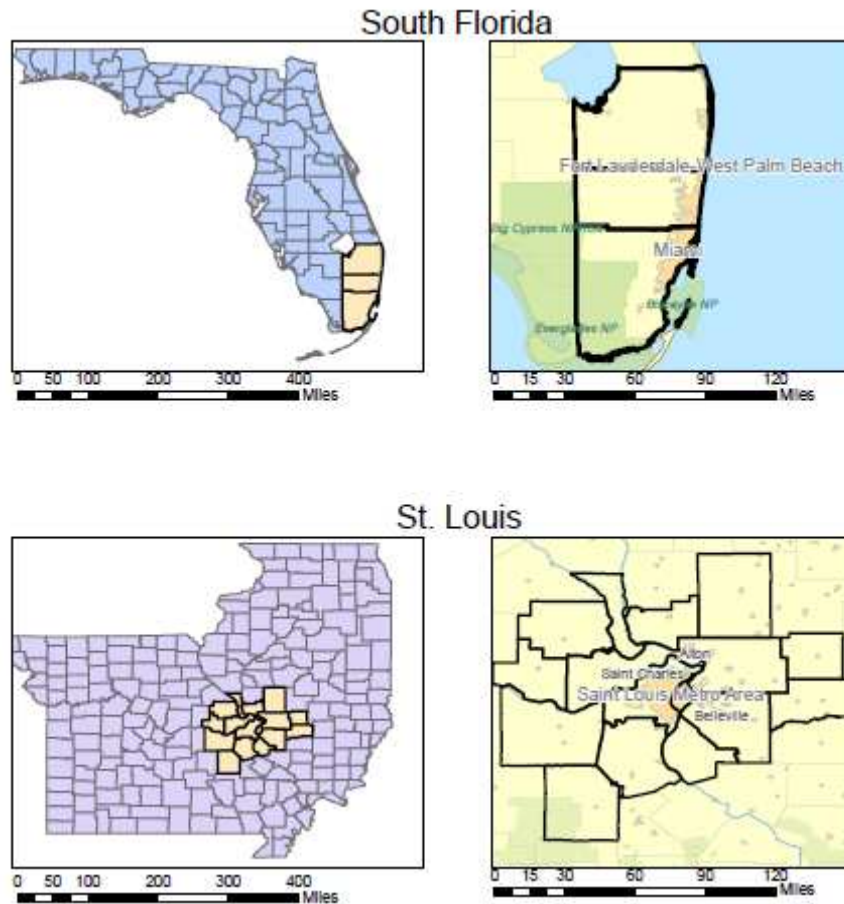
Fig. 1: The Two Metropolitan Areas

5.1 The Two Metropolitan Areas, Overview of Demographic and Economic Characteristics

The St. Louis-St. Charles MSA, generally known as the Greater St Louis metropolitan region, is the 15th largest such agglomeration with a 2009 population estimate of 2,892,874. The "Gateway to the West" is anchored by the City of St. Louis and includes seven counties in the State of Missouri and eight counties in the State of Illinois. The land area covers roughly 9,100 sq. mi (14,645 sq. km) with an overall population density of 326 sq. mi (125/sq. km). The GDP (gross domestic product) was 128.5B in 2008. GDP per capita has stayed fairly constant from 2001 through 2008, although overall GDP grew by 2.6% from 2008-2009. The City of St. Louis has a population of 355,078, while St. Louis County has a population of 994,923. Four other counties have significant populations: St. Charles (355K), Madison (268K), St. Clair (263K) and Jefferson (219K). Although the overall CSA grew by 4.5%, the city of St. Louis lost 12.2% of its population in the 1990s. However, the city appears to have turned this around for the first time since the 1950s during the 2000s, with an increase of 1.94 percent (Swanstrom, 2011).

The South Florida urban agglomeration is the 7th largest in the US with a population estimate of 5,547,051 in 2009. The "Gateway to the Americas" includes the cities of Miami, Fort Lauderdale and West Palm Beach. The total land area is 6,137 sq. miles (9,876.5 sq. km) with an overall density of 1,571 per sq. mi (556/sq. km). The GDP in 2008 was 261.2B. GDP per capita in the region has increased during 2001-2008 from 35K to 40.4K, with the major increase occurring in 2004 and 2005; however, overall GDP fell by 1.5% from 2008-2009. The city of Miami has a population of 418,480, while Miami-Dade County has a population of 2.457 million. Broward and Palm Beach have populations of 1.759 million and 1.268 million. Other major cities include Hialeah (214,325), Fort Lauderdale (177,885), Pembroke Pines (144,906), Hollywood (139,610) and West Palm Beach (94,526).

Variable	St Louis MSA	South Florida MSA
Population Size (2008, 2000, growth rate)	2,828,3998 / 2,700,011 / 4.8%	5,525,947 / 5.007,564 / 5.9%
Households (2008, 2000, growth rate)	1,117,722 / 1,048,818 / 6.6%	2,072,456 / 1,905,394 / 8.8%
Average Household Income (2008 / US Average)	$66,294 / $67,918	$69,600 / $67,918
Projected HH Income Growth Rate (Local / US Average)	9.7% / 11.7%	11.9% / 11.7%
Median Household Income (2008, 2000)	$51,253 / $44,539	$48,346 / $40,778
Per Capita Income (2008, US Average)	$26,465 (22,473) / $25,933	$26.350 (22,339) / $25,933
Male/Female Ratio (2008, 2000)	0.94 / .93	0.95 / 0.93
% Age < 18 (2008, 2000)	24.24% / 26.21%	23.16% / 23.61%
% Age >= 65 (2008, 2000)	12.96% / 12.98%	16.03% / 16.45%
Median / Average Age (2008, 2000)	37.78 (36.04) / 37.95 (36.60)	39.6 (37.65) / 39.59 (38.85)
% HH in Families (2008, 2000)	67.96% / 67.58%	66.30% / 66.32%
Average HH Size (2008, 2000)	2.48 / 2.52	2.62 / 2.58
% Single Female Householder (2008)	16.22%	15.20%
HH Average Number of Vehicles (2008, 2000)	1.74 / 1.72	1.52 / 1.51
% Drove Alone (2008, 2000)	82.74 % / 82.49%	77.52% / 77.31%
% Work At Home (2008, 2000)	2.94% / 2.88%	3.13 % / 3.07%
Average Travel Time to Work (2008, 2000)	27.99 / 27.73	30.65 / 30.37
Total Employed (over 16) (2008)	1,490,586	2,423,543
% Government Workers (Total, local/state/federal) (2008)	10.76 / 5.31, 2.79, 2.66	12.30 / 8.04, 2,34, 1.92
% Private Workers (Total, profit/non-profit) (2008)	84.06 / 74.53, 9.53	81.65 / 76.6, 5.05
% Self Employed (2008)	4.95%	5.75%
Mngt, Bus & Fin Operations (2008, 2000 / US Average 2008)	13.7% (13.59) / 13.7%	14.7% (14.29) / 13.7%
Professional + Related Occupations (2008, 2000 / US Average 2008)	20.4% (20.46) / 20.3%	18.1% (17.92) / 20.3%
Services (2008, 2000 / US Average 2008)	14.6% (14.87) / 14.6%	16.6% (16.89) / 14.6%
Sales and Office (2008, 2000 / US Average 2008)	27.9% (27.96) / 26.7%	30.6% (30.54) / 26.7%
Const, Extraction + Maintenance (2008, 2000 / US Average 2008)	9.2% (8.94) / 9.5%	9.5% (9.63) / 9.5%
Prod, Transp & Material Moving (2008, 2000 / US Average 2008)	14.0% (13.96) / 14.4%	10.0% (10.21) / 14.4%
% White Collar (2008, 2000, US Average 2008)	61.6% (61.66) / 47.2%	63.2% (62.64) / 47.2%
Masters, Professional or Doctorate Degree (Place,US)	8.93% (9.02) / 8.9%	9.45% (9.34) / 8.9%
Bachelors Degree (2008, 2000 / US Average 2008)	15.78% (15.82) / 15.8%	14.95% (14.77) / 15.8%
% Owner Occupied (2008, 2000)	72.4% / 68.6%	66.5% / 66.32%
% Built < 1939 (2008, 2000)	15.2% / 16.2%	2.16 % / 2.54%
Median Year Structure Built (2008, 2000)	1966	1980 / 1977
% Black (Place, 2008, 2000 / US Average 2008)	18.3% (17.74) / 12.4%	19.8% (18.9%) / 12.4%
% Hispanic (Place, 2008, 2000 / US Average 2008)	2.05% (1.50) / 15.2%	39.2% (34.03) / 15.2%
% Speak Only English at Home (2008)	94.83%	55.56%
Estimated Median Owner-Occupied Housing Unit Value	139,543 / 95,103	288,438 / 110,247
% 1 Unit Detached (2008, 2000)	68.56% / 68.24%	42.8% / 42.46%
% 3-19 Units (2008)	13.94%	16.96%
% 20+ Units (2008, Total, 20-49, 50+)	4.64% / 1.81, 2.83	25.01% / 9.63, 15.38
% Mobile Home, Trailer, Boat, RV, Van, etc	5.22%	2.99%
Average Length of Residence	10	8
Peak Building Period	1939 or earlier (15.2%)	1970s, 22.2%, same as US 16.2%
% Familes Below Poverty (2008, 2000)	7.6% / 7.5%	10.78% / 10.78%
% HH < 15K, 15K-25K	11.64% (14.13) / 10.35% (12.28)	14.08% (17.39) / 11.17% (13.49)

Fig. 2: Representative SES Variables for Two Metropolitan Areas

Interpretation of summary statistical measures shown in Figure 2 indicate a number of key similarities and differences, not discussed below, between the two metropolitan areas, including:

- First, there is an "order of magnitude" difference. South Florida (hereafter, SF) is roughly twice the size of Saint Louis (hereafter, SL) in terms of population and Gross Domestic Product.

- **Similarities** are evident in attributes related to income and certain racial characteristics. Estimated median income in 2008 was $26,465 for SL and $26,350 for SF. SL had an estimated 18.3% black population compared to 19.8% in SF.

- **Differences** appear in attributes of ethnic origin, language, density, and housing type. The proportion of Hispanic households in SF is 39.2% compared to only 2.05% in SL. Nearly all SL residents (94.83%) speak English at home, while in SF that proportion is only 55.56%. Overall density is .326K/sqmi within SL compared to 1.571K/sqmi within SF. Finally, the housing stock varies significantly. In SF, about one fourth of its residential units are in buildings with twenty or more units. SL is made mostly of single family residences, with only 4.64 percent of buildings being comprised of twenty units or more. Furthermore, 15.2% of SL's housing stock was built before 1940, with the median year being 1966. SF's housing stock average build year is 1980

5.2 Results: Values of Key Attributes & What It Means

5.2.1 Overall Diversification of the Economic Structure

Calculation of the Shannon Entropy measure in 1991 and 2009 yielded values of .94 and .94 for SL and .94 and .90 for SF. Both are rather high.

Perhaps somewhat surprising is that SL is a more diversified economy, given the impression of decline. Also interesting is that South Florida has become more specialized. Employment in SF grew at 5.4 percent while SL grew at 4.9%.

5.2.2 Shift-Share Analysis & Sectors – Comings and Goings of Large Firms

For metropolitan SL, about 119K jobs were added over the 1991-2009 time period. The largest growth in absolute numbers was in the "education and health services", "professional and business services", and "leisure and hospitality" sectors. As expected, there was a large loss of manufacturing jobs. When partitioned by "source" of growth, the Shift Share analysis reveals that over 100% of growth was due simply to growth in the larger economy. This "curious" result is only possible because of the negative growth associated with the industrial mix and local conditions. However, the (negative overall) local share of growth includes positive results for the "information" and "financial activities" sectors. The small growth (6K jobs per year) appears to be attributable to these sectors.

For metropolitan SF, approximately 437K jobs were added over the past two decades. The largest growth in absolute numbers was in the "educational and health services", "professional and business services" and "leisure and hospitality", and "trade, transportation, and utilities" sectors. As expected, there was a large loss of manufacturing jobs. When partitioned by "source" of growth, the Shift Share analysis reveals that the growth in jobs in attributable to all three components: national economy (70%), sectoral growth (9%) and local competitive advantage (21%). Those jobs were obtained in the "trade, transportation and utilities", "professional and business services", "education and health services" and "public administration" sectors. The growth (26.2K jobs per year) is attributable to, other than national and sectoral growth, to these sectors. This makes sense, since the region is not a global player in financial matters, nor is it a center of innovation in information technology. Perhaps more shockingly is the lack of a "catalyst" function for the leisure and hospitality sector, South Florida's business moniker, even in an economy where this sector is one of the fastest growing ones.

Both regions have their share of large and persistent companies. St. Louis Regional Chamber and Growth Association reports employers with 10,000 or more employees to include Washington University in St. Louis, BJC Healthcare, Schnucks Markets, SSM Healthcare, Wal-Mart Stores, Inc., Boeing, the U.S. Postal Service and Scott Air Force Base (St. Louis Regional). In St. Louis, the mergers, acquisitions and takeovers have become routine. Two major examples are Ralston Purina's merger with Nestle and Anheuser-Busch's merger with InBev. The two companies still have a strong presence in the region, but are no longer the hometown companies they once were. However, Schnucks Markets, a major grocery chain in the Midwest, is headquartered in St. Louis and has acquired several companies, including local rival National as well as

other chains in the south and upper Midwest, some of which now bear the Schnucks name. The major companies headquartered in South Florida are Office Depot, located in Boca Raton and World Fuel Services, Carnival Cruises, Ryder Systems, Royal Caribbean Cruises, and Brightstar, all located in Miami-Dade County. Acquisitions by local companies include Royal Caribbean's and Carnival's takeovers of competing cruise lines, as well as Ryder Systems expanding its operations.

5.2.3 Migration In/Out and Foreign Born

SL had a negative domestic migration balance, 42K, from 2000-09, with a loss in the "core" of 63K and growth in suburban areas of 21K. For 2008-2009, all balances were negative. The patterns are similar for SF (-284K,-297K, 13K; -29K, -25K, -4K). SL attracted a net increase of 30K immigrants, 12K in the core and 18K in suburban areas. The short term (2008-2009) numbers are 2.9K, 1.1K, 1.8K). In SF, 506k immigrants arrived, 319K in the core, and 187K in the suburbs. The short term pattern mirrors the long term pattern (51.5K, 32.5K, and 19K). The % of Foreign Born in SL is ~ 4%, of which 54% are not US citizens. In SF, the comparable numbers are 36% and 53%. In SL, 63% of Foreign Born entered before 2000; in SF, the ratio is .73.

In SL, Asia (38%), Europe (31%), and Latin America (19.8%) constitute the immigrant population; in SF Latin Americans (85.2%) dominate immigration patterns. Frey (2003) reported even before the Great Recession that the South Florida region gained more in international migrants than it lost in domestic out-migration. Frey states that "while the Sunshine State gained between 150,000 and 270,000 migrants annually from 2000 to 2005, it actually experienced a net loss of domestic migrants from 2007 to 2008. Only births and immigration from abroad have kept Florida's overall population from dipping" (2009). Using Census 2000 data, he reports in 2001 that "minorities make up 27 percent of suburbanites in these metro areas, up from 19 percent" in 1990 (Frey, 2001). This indicates that in South Florida, immigration, not migration, is fueling continued growth in the region. Once these immigrants arrive, whether in SL or SF, it appears that they are increasingly heading to the suburbs versus the central city, along with other racial minorities.

5.2.4 Education and Creativity

Data for this section is drawn from Figure 2 above. At the bachelor level, both metropolitan areas are at or slightly below the national level for the number of bachelor degrees conferred, both in 2008 and in 2000. SL is closer to the national average in 2008 (15.8%), but its proportion has dropped marginally in the last 8 years. SFs population is historically undereducated (more than 1% below national averages), and is still below, although its percentage has increased infinitesimally over the past 8 years.

At the graduate level, both metropolitan areas have slightly above comparable US levels (8.9%). In SL, the percentage of graduate training has declined over the 2000-08 period from 9.02 to 8.93, while in SF the comparable numbers are 9.45% to 9.45%, well above national averages. We might conclude that evidence is appearing of brain drain / attraction. The number of PhDs in both places hovers around .89% in both places and time periods.

Empirical evidence from academic and professional research confirms these raw number conclusions. For example, in Florida's landmark creative class study (2002), SL was ranked 66th in terms of creative class occupations, while Miami and West Palm Beach (two separate metropolitan areas until 2004) were ranked 116th and 130th respectively. Glaeser (2004) noted both the cities of St. Louis and Miami both rank low in % Bachelor Degrees for all cities of greater than 250K.

5.2.5 Connectivity

Even from a cursory perspective, a first observation is that SL relies on one airport – Lambert Field, while SF relies on three airports – MIA, FLL, and PBI – each with slightly specialized functions. MIA is an international passenger airport, but also a busy freight terminal. FLL serves low-cost carriers, focuses on the passengers that are using the airport to connect to cruise lines at both Port Everglades and the Port of Miami. PBI is a more general airport whose main emphasis is on north south routes.

In 2000, Lambert Field was among the top airports in the US in terms of total passengers. In 2003, Lambert ranked as the 21st busiest airport in North America for aircraft operations and 23rd in passengers (ACI, 2003). Data for 2004 reveal 283,647 aircraft operations with approximately 14M passengers. The airport averaged 756 daily arrivals and departures. By 2010, only approximately 6M passengers were served

(Lambert Airport Stats, 2010). Nevertheless, the airport is estimated to have a $5.1 billion annual impact on the region.

By comparison, MIA ranked no lower than the top 20 in six key categories in 2009. It was 1st in international freight, 2nd in international passengers, 3rd in total freight, 3rd in total cargo, 19th in total operations, and 12th in total passengers. MIA also fared well internationally as it was 10th in international freight and 25th in total passengers. MIA was also 11th in total freight and 28th in international passengers. In 2000, MIA was ranked 19th with 33.6M passengers and 28th in 2009 with 33.88M passengers (ACI, 2000, 2009). The total economic impact of Miami International and local general aviation airports is $26.7 billion as of January 2011.MIA and related aviation industries contribute 282,043 jobs to the region (MDAD, 2011).

6   LESSONS LEARNED

There are four major lessons learned in the conduct of this paper. Each is discussed in turn; but relatively more attention is given to the last lesson: "what long term thinking means about short-term purposeful action" and even more specifically in terms of our two case study metropolitan areas.

6.1 Placement on a Trajectory

The first lesson is that is possible to "discover" or "place" a city or region on a long-term trajectory (whether it be linear or sinusoidal). SL appears to be in later stages of an industrial-highway oriented period, with its iconic business, Anheuser-Busch, now owned by outsiders. As with other places, the region, as opposed to the city, is the dominant "concept" for economic growth. The playing field is balkanized – rich areas next to poor, regardless of political boundaries. SF on the other hand is transitioning from an economy based solely on tourism to a more balanced economy and is need of further diversification.

6.2 There are Some Attributes that are Invariant to Long-Wave Influences

The expectation was that cities and regions that are in different "stages" in their lifecycle would exhibit very different set of properties across a range of variables. Perhaps this is not the case. In our two metropolitan areas, there are a number of remarkable similarities. These include: educational attainment, overall income characteristics, GDP per capita, diversification of the economy. This despite differences in built form and characteristics of the housing stock.

6.3 The Coast Still Matters

The second lessen appears to be that, following Braudel, the coast still matters. In contemporary terms, SF is both larger and more dynamic (growing faster in terms of population and income) than SL. The "supply chains" of SF are more global; it is higher in the GAWC rankings. Clearly, coastal and inland cities must and can exist and prosper. There is nothing new or profound in this statement.

6.4 Follow the Model: What Does It Mean for Short Term Purposeful Action

Long-wave theorists don't spend too much time discussing the daily life of "less than Alpha cities." Yet, they clearly exist. In global economic terms, they are part of the supply chain that feeds the top. The top cities cannot exist without their supply chains. The point is to "know and appreciate" where you are.

As conditions change in terms of "relative position", cities and regions must re-invent themselves to fit into their hierarchical place. Braudel talks about how cities in Europe changed hands in terms of dominance due to what they were good at and how they accentuated their strengths at the time, whether it is in commerce, finance, or other sectors. What can SL do to assert itself and what can SF do to maintain growth? Diversify, encourage entrepreneurs and small business growth, invest in education, which in turn attracts highly skilled migrants and become more connected regionally, nationally and globally. Below we identify five short term purposeful strategies or actions – developed along the five key attributes of the heuristic model.

Maintain Diversity: the key is to find and nurture sectors that will both add to growth while maintaining economic diversity. Purposeful strategies will be different in the two economies

A Job is Not a Job: the analysis suggests that both should seek to improve the competitive advantage of its leading firms. Strengthening key clusters is a viable long term strategy.

When thinking long term, one must think rationally and realistically. If SL and SF are "Less than Alpha" cities, they must know their positions and maximize their assets to reinforce their positions. Thinking long term also negates most of the fads many speak of today with regards to economic revitalization, growth and

rejuvenation. Since these regions are on a path, and it is difficult to change course or jump ship, if you will, thinking long term is the only way these regions can follow a new path if so desired.

Migration Still Matters: even in the context of the current myopic discussions about migration in general, international migration will continue to play an important role in SF, mostly due to its "gateway" status. On the other hand, SL draws from a broader pool of international migrants but attracts few in the process. Domestic in-migration seems to have slowed in both places (this may be due only to the current economic crisis, but it may also be due to the general non-competitiveness of both economic markets). Out-migration will not abate unless both metros focus on education, as is discussed in the following section.

Human Resources and Education Matters: it is obvious that both metropolitan areas fall far short on both "creativity" type solutions and that there is room for improvement in the standing of higher education. The rich heritage of SL should be continued and expanded. The SF story is one of continuing expansion. But, education is more than technology or STEM type programs. An educated workforce can quote Plato and Shakespeare! The State of Florida ranks near the bottom in educational spending, at all levels of education.

Air Transport is Important: air transport in terms of both passengers and freight are important dimensions for the local economy and quality of life. There is evidence that SL is pursuing a "freight handling capacity". This might or might not be a good strategy, since it is being attempted by everyone; there is only so much freight that can be handled. For SF, the key seems to be to make bigger and better an integrated air-sea-rail capability. Trade and transportation is already a key sector in the SF economy; it can continue to be a major player.

Finally, long wave thinking suggests that cities and regions go through periods of boom and bust and that they are continuously in the process of re-inventing themselves – whether than re-invention is further strengthening existing strengths or the creation of new strengths. Just as Fordism and highways created the city and region of the mid 20th century, producer services and tele-mobility will create the cities of the near 21st century. The only thing "certain" is long term change.

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