

**GOING URBAN: MARKING CITIES, CITY NETWORKS AND GLOBAL
COMMODITY CHAINS IN THE CAPITALIST WORLD-ECONOMY**

by

Alejandro Christian D. Soler

A dissertation submitted to the Faculty of the University of Delaware in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Political Science and International Relations.

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Colleagues and acquaintances alike have asked why I chose cities, airports, and commodity chains as my dissertation topic. To an extent, they are all justified. I took one class on cities [urban policy, specifically], nothing else. Instead, I relied heavily on conversations with and suggested readings by one of my committee members and the genius who is Dr. Bob Denemark, to fuel a passion rooted in my childhood days. As a kid, the most exciting part of any trip overseas was the ride to and stay at the airport. As I grew older, my love for cities and fascination with how products get from point A to B got stronger. For that, I thank the love of my life, Kat, for her undying encouragement, support, and understanding. This modest contribution to the academia is for you.

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LIST OF ABBREVIATIONS

ACT:	Air cargo throughput
DC:	Demographic change
EC ₁ :	Economic change, expressed as city GDP per capita
EC ₂ :	Economic change, expressed as city employment rate
GC:	Geographic change
GCC:	Global Commodity Chains
GCN:	Global connectivity scores
GDPC:	GDP per capita, national-level
IR:	International Relations
NAT:	New airport or terminal built
NIDL:	New International Division of Labor
PAF:	Passenger air flows
PCT:	Port cargo throughput
POL:	Polity IV scores
TNC:	Transnational company
UNE:	Unemployment rate, national-level

ABSTRACT

The research question this dissertation attempts to answer is whether air freight is significantly associated with population growth; or the income and employment of people in cities; or green geographic spaces. I hypothesize that air cargo throughput is positively associated with these four variables. After appraising the literature on cities, world cities, and world-city networks, as well as establishing the link between airports and cities, I utilize two methods to test my hypotheses. First, I compare two cities – Detroit and Doha – which initially experienced economic and demographic growth before going on opposite developmental trajectories, using the most different systems design [MDSD]. Second, I employ multiple linear regression to test my hypothesis. The results indicate that 1) air freight has a positive association with green area in cities without seaports; 2) air freight is significantly associated with urban employment in cities with seaports; and 3) air freight results in population growth in cities with seaports.

Keywords: Cities, International Relations, capitalist world-economy, uneven development, global commodity chains, air freight, airports, airport cities

Chapter 1

MARKING CITY NETWORKS AND MEASURING GLOBAL COMMODITY CHAINS

The study of international politics has traditionally taken the international system of nation-states, or the nation-state, or the individual – heads of state or government – as units of analysis. Seminal texts have stressed the importance of consciously and responsibly choosing a “level of analysis” to establish a “stable point of focus,” whether it be the system *or* the state (Singer 1961, 78); or the interaction of man, the state and the international system in accounting for war and peace (Waltz 2001, 1-15); or the distinctiveness of the system as compared to its interacting units (Waltz 1979, 40-1). Arguably the most prominent unit of study is the state (Taylor 2013). This is the case as the state has trumped other forms of social organization in recent history, such as city-states or confederations or empires or theocracies (Spruyt 1994, 153-80). The Westphalian state system has a historical record in “taming” cities (Flint and Taylor 2011, 249-53).

Yet if history is to serve as one of the justifications for objects of analysis, cities must occupy a place in intellectual discourse. However, since the pervasive view holds that international issues either fall within the purview of states (Sassen 2012, 6), or are coterminous with nation-states (2012, 59), the city as a unit of analysis in global politics has had the misfortune of being both neglected and underappreciated. The same is true in the study of the political economy of commodity chains. Overlooking the city comes at a cost: cities are critical nodes in "global commodity chains" [GCC]

as they connect advanced producer services that possess the means to deal with and control cross-border networks of production and distribution of commodities (Parnreiter 2010, 36).

This dissertation aims to explore the relationship between air cargo throughput and the economic, demographic, and geographic growth of cities, which I propose make up a multifaceted conceptualization of urban growth. Air cargo throughput is operationalized as the volume of freight [including mail] processed and handled in an airport. Air cargo throughput, measured in metric tons in this dissertation, is the sum total of inbound and outbound commodities. Goods that enter an airport, then leave from the same airport, are counted only once. I hypothesize that increased air cargo throughput leads to the demographic, economic, and geographical growth of cities. Specifically, air freight is positively associated with urban population, personal incomes and employment of people in a city, and green areas or spaces. It is important to stress that, despite my hypotheses, the research question I pose is open-ended. I do not have a pre-conceived result in mind despite related literature suggesting that increased air cargo throughput leads to growth and development. If my hypotheses are confirmed, they would: 1) empirically support a growing school of thought that emphasizes the relationship between airports and cities; and 2) advance a novel argument about determinants of a multifaceted conceptualization of urban growth. If at least one of my hypotheses were debunked, it would raise issues related to the political economy of constructing mega-billion infrastructure projects such as airports, as well as the notion that they are gateways to sprawling cities littered with large capitalist firms.

This first chapter proceeds in five parts. First, I operationalize my theoretical framework and attempt to arrive at a working definition of the city. Included in this subsection is a discussion on the capitalist world-economy. Second, I review scholarly work on the relationship between airports and cities. In the third section, I identify specific city networks, and how they were conceptualized and measured. The fourth section is a cursory introduction to global commodity chains (GCC). I postulate that cities are integral nodes in GCC that transcend the nation-state level. In section V, I consolidate the preceding sections with a few propositions, namely, that cities 1) serve as nodes that facilitate the trade and distribution of global commodities through another understudied aspect of IR: air freight, and 2) vivify the reality that capitalism and neoliberal governance are unquestionably tied to space.

1.1 "City limits:" Working Definitions

There is no single, overarching definition of an urban space, or the city. Difficulties arise as a result of the breadth of the subject area, which renders the task of delimiting the parameters of studying urban zones a complex task (Paddison 2001, 1). But this does not imply that ‘city-ness’ is nebulous. A survey of conceptualizations from various scholars offers a refined understanding of the city, one that is both attribute-based and relational.

Conceptualizing the city in the context of an urbanizing world is a prerequisite to grasping its significance as a unit of analysis. 2007 marked the first time in human history that the majority of the world’s population lived in cities (Hall and Barnett 2012, 3). Competing notions of the city are inconsistent since they differ across political boundaries, sometimes based on administrative and functional boundaries, and other times on ecological variables such as density and population size (Frey and

Zimmer 2001, 14). Cities are “many things: a spatial location, a political entity, an administrative unit, a place of work and play, a collection of dreams and nightmares, a mesh of social relations, an agglomeration of economic activity, and so forth” (Hubbard 2006, 1). But their defining features are human density, political incorporation, and some shared sense of interdependency (Latham et al. 2009, 2), for “cities are civilization,” and therefore “economic, social and political creatures” (Pierre 2011, 13).

Moreover, a city is a “permanent and densely settled place with boundaries that are administratively defined...[which is] the accomplishment of a population whose members work on non-agricultural tasks” (Monti Jr. 2005, 99). The term ‘accomplishment’ has at least three implications. First, the city can be identified by its physical infrastructure and sheer population size. Second, a pervasive distinct urban culture is observable. Third, the city maintains relationships with settlements dispersed over a much larger territory (ibid.). Pacione extends this line of thought by identifying four characteristics of the urban zone as a unique entity: its population size, which may vary in relation to a given national population; its economic base, or, especially engagement by the populace in non-agricultural activity; its legal or administrative criteria such as boundaries; and its functional definitions, in place to prevent both under- and overbounding (2009, 20). The city is also a way of life that inhabitants attach meanings to (2009, 21-2).

Cities, therefore, are not simply empty vessels where people live, where companies locate, and where events take place. Rather, they are political entities with formal governance structures, public-private partnerships, and fluid administrative boundaries. Likewise, cities include geographical agglomerations of a transnational

class of capitalists shaping the production and distribution of commodities through advanced service producers and global logistics firms.

1.2 Airports and Cities: Seminal Pieces

One of the first mentions of “transportation” as a criterion for hierarchically ordering cities could be found in Friedmann (1986)’s ground-breaking work on world city hierarchies. Along with being major financial centers; headquarters for transnational corporations and international institutions; sites of rapid growth of the business services sector; and important manufacturing and population centers, Friedmann mentions the term “major transportation node” (1986, 72). His findings reveal that all but two “primary world cities” – São Paulo and Singapore – are in core countries (1986, 71).

The most interesting part of Friedmann’s assertion is his terminology. A transportation node connotes a vibrant part of a global transport network. While Friedmann does not operationalize “transportation,” there is room for speculation about what he meant. Passenger traffic and air and/or sea freight movement are plausible conjectures. What unites these types of movement is infrastructure: passengers or air cargo make use of airports, while sea freight is possible only via seaports. Certainly, his inclusion of a major transportation node as a criterion for what constitutes a world city is an important step in establishing the relationship between airports or seaports, and cities.

One of Friedmann’s contemporaries, Timberlake, co-authored a piece that specifically focuses on the relationship between airports and cities (Shin and Timberlake 2000). They situate the place of Asian world cities “in a world system of cities by focusing on the...flows of airline passengers around the world” (2000, 2258).

Shin and Timberlake refer to the “airport in a city” as a gateway enabling places to connect with other parts of the world (2000, 2262). They refer to this as an airport’s gateway function, which has been key to the development of the contemporary urban system in the Asia-Pacific (ibid.). Cities, meanwhile, are what they call “terminals for an international transport network” (ibid), a framework that fits what Friedmann had asserted a decade-and-a-half before.

Indirectly building on these two pieces, Hesse looks at the world city rankings revealed by Taylor, et al. (2011), and observes that the top 25 cities in their rankings all host major airports (2013, 35). However, he questions the traditional assumption of infrastructure provision for the erection of airports in world cities. Instead, he cites the organization of freight handling, which is both a function of airport efficiency and the geographical agglomeration of airports (ibid.). In other words, airports in cities are not only linked, but are also nodes in a wider network of passengers and cargo. The latter as a measure of airports is the focus of this dissertation.

Air transport has facilitated and accelerated the exchange of global commodities is air. While the weight or volume of goods moved by air is less than five percent of all commodities transported, they make up above 30 percent of the total value of shipped goods (Morrell 2012; Sales 2013). Two insights could be gathered from this proposition. First, the movement of valuable, high-end goods via air indicates that this mode of transport is crucial to the maintenance of a capitalist world-economy predicated on high-value goods and large profits. Second, air freight, because of its share in the total value of traded and transported commodities, could serve as a proxy measure for global trade.

While not all airports publish data on the specific monetary value of the freight they process, those that do more concretely substantiate how air freight could be a plausible proxy measure for global trade. One of the airports that releases data on the value of goods processed is London-Heathrow. From August 2014 to July 2015, £48 billion [\$72.9 billion] worth of British goods exported through Heathrow Airport, representing 26 percent of all UK exports by value (Burns 2015). In 2014, £101 billion in total goods travelled via Heathrow – twice the value of the commodities processed in the British Isles’ two largest shipping ports [Felixstowe and Southampton] – combined (Heathrow Airport 2016). By value, the most expensive goods shipped via air were jewelry and precious metals [£4.37 billion/year]; machinery [£2.13 billion]; medicines and pharmaceuticals [£1.24 billion]; electrical machinery [£0.88 billion]; and photography and cinematographic equipment [£0.83 billion] (ibid.).

Smaller airports in terms of cargo throughput such as Flughafen Wien [Vienna International Airport] demonstrate the difference in the role air cargo operations have in a given city. Although not as detailed about the exact values of each commodity processed in the airport, Vienna International Airport states that air cargo handling accounted for eight percent of the airport’s total revenue in 2015, or €28.7 million [\$32.2 million] out of €359.2 million [\$402.4 million] (Flughafen Wien AG 2015). Despite the stark difference with Heathrow Airport’s air freight activity, Vienna International Airport is a geographically strategic trade node. It promotes itself as the European Union’s “most easterly freight handling airport in the European Union from and to south-east Europe,” with dense and reliable networks of feeder transport and motorway networks connected to the entire continent (Vienna International Airport 2016). In spite of its limited carrying capacity relative to other airports, Flughafen

Wien is an example of the centrality of airports and their freight distribution functions to global trade.

1.3 Cities through History

It is vital to study cities as they are one of the earliest forms of human organization to generate economic growth through the exchange of goods and technology. Trade and commerce between regions could be traced all the way back to the Middle East during the Neolithic age (Bairoch 1988, 20-1). Nascent, capitalist urban trade networks emerged beginning in the twelfth century. According to Abu-Lughod, the Champagne Fairs attracted merchants from as far away as England, Scotland, and Greece (1989, 62). Despite not having unique and natural characteristics that would make it a vibrant meeting point of merchants, Champagne became one because of the “independence and motivation of the counts” who received great profits from the fairs (1989, 58).

Cities in the premodern world-system expanded as demand for Flemish textiles increased. The epicenter of textile production was the Flemish city of Ghent. Its producers secured contracts with the Genovese and merchants from other Italian city-states to ship the goods eastward (Abu-Lughod 1989, 84). Another Belgian city, Bruges, served as the link between outside suppliers and markets and more proximate centers of production, including Ghent (1989, 87). But a new port in Sluis connected Bruges with Genoa and changed its longstanding economic base (1989, 88). Once made up of sailors who would come and go, Bruges’ merchants now stayed home. Many of its native upper-class served as brokers, inn-keepers, and commission agents (de Roover 1948, as quoted in Abu-Lughod 1989, 89). Bruges had established itself as

a proto-command and control center, reminiscent of today's world cities that house advanced producer services.

Abu-Lughod's meticulous account of the interconnectedness of cities in the premodern era highlights the key role cities have played in the capitalist world-economy, even before the technological advances of the industrial revolution, or the political changes that the Peace of Westphalia brought about.

Flint and Taylor carry this historical analysis forward and find that urban demographic and economic growth predated the three hegemonic states Wallerstein says shaped the modern world-system: the Dutch Republic, Great Britain, and the United States (Wallerstein 1984). Flint and Taylor observe three explosive city growths, all of which constitute what they call growth spurts, preceding the foundation of the Dutch Republic (2011, 245). Amsterdam first experienced this city spurt before Leiden and Rotterdam, respectively (2011, 245-6). This observation debunks the notion that the Republic of the Seven United Provinces was little more than just an "Amsterdam city-state" (2011, 245).

A similar observation applies to Great Britain's hegemony. Four major northern British cities: Birmingham, Glasgow, Liverpool, and Manchester, accounted for eight of the 13 explosive city growths in the eighteenth century (Flint and Taylor 2011, 246-47). Multiple spurts come before British hegemony, which is consistent with Flint and Taylor's thesis of cities making hegemonies (2011, 247). In the case of the United States, four port cities – Baltimore, Boston, New York, and Philadelphia – predated American hegemony, followed by inland explosive city growths in Chicago and Pittsburgh (ibid.).

This process of urban demographic and economic growth, also known as front-loading, validates Flint and Taylor's position that cities – not states – are the true generators of growth. For them, the state apparatus serves only to safeguard and protect the interests of cities. This offers a key insight particularly to scholars of historical methods or international political economy. Since cities have a proven historical record of ushering in growth before their respective states, it would perhaps be insightful to analyze the growth spurts of cities, not just states. Perhaps, scholars in these fields have misattributed demographic and economic growth to states and not [properly] to cities. Surely, this historical evidence is worth investigating.

1.4 Cities and City Networks

Cities do not exist in isolation from global processes, let alone from one another. The premodern examples of Champagne, Bruges, and Ghent attest to this. A city's *raison d'être* lies in its connections, or "external relations," for it never operates purely on its own (Taylor 2004, 2-3). A rich, vast and transdisciplinary body of literature on cities, city and world city networks, and cities in globalization validates this (Derudder et al., 2012; Knox, 1995; Sassen, 2001b; 2002; 2012; Taylor 2003; 2004; 2005; 2007; Taylor et al. 2007; Taylor et al., 2011; Timberlake, 1985; Timberlake and Smith 2012). Because a majority of scholarly work on urban networks employs terms such as "world or "global" cities, there is a common misconception that their sole focus is on cities in the Global North. Perhaps, this arises from the conflation and interchangeable use by academics of these two terms. The term "world cities" refers to integration into a "worldwide network of urban areas," and the varying degrees of their importance to the global economy. The term "global cities" alludes to

a select number of urban localities able to control production by virtue of housing advanced producer service firms (Timberlake and Smith 2012, 249).

Intensified flows of capital, information, and people identified with globalization have given the city a more prominent role in the workings of global politics (Sassen 2001b, 256; Timberlake and Smith 2012, 247). Bold predictions about cities displacing the centrality of the state are no longer deemed ludicrous (Flint and Taylor 2011, 244; Taylor 2003, 130-31). While the latter is not the objective of this sub-section, it is a viable proposition that could be further scrutinized especially in light of the power and control – once monopolized by the homogenous unitary state – exerted by actors in cities (Knox 1995, 6-8), whether they are “world” cities (Friedmann, 1986), “global” cities (Sassen 2001a) or “ordinary” cities (Robinson, 2006) that are “off the map” (Robinson, 2002). The next section discusses the power and authority exercised by various actors in cities through city networks and the constitution of these networks, resulting in uneven geographies of development. Uneven development emanates from the contradictions inherent in capitalism and the structural conditions giving rise to world city networks.

1.5 Constitutive Parts of City Networks

The most thoroughly analyzed city networks are those concomitant with the capitalist world-economy. Seminal pieces (Friedmann and Wolff, 1982; Friedmann, 1986; Sassen, 2001a) on the relations between cities, and their bearing on the world economy, have triggered rigorous academic work. The world city network, ontologically, has been termed an interlocking network on three levels. At the net-level are “spaces of flows” (Castells, 2010) based on “productions of multiple flows in networks and chains” (Flint and Taylor 2011, 314). The nodal level is composed of

cities. The sub-nodal level is made up of advanced producer service firms (Taylor, 2004; Taylor, Ni, and Derudder 2011, 4). These firms – accountancy, advertising, banking/finance, insurance, law, and management/consultancy – interlock the cities to produce spaces of flows (Taylor, Ni, and Derudder 2011, 4-5).

These concepts are important as they help avoid the notion of ‘anthropomorphic cities,’ a reification that transforms cities into actors that allegedly “do,” “perform,” and “create.” While cities are viable units of analysis and nodes, they are *not* themselves actors. Agency is undertaken by the sub-nodes, whether in the form of law firms, consultancy services, or global logistics firms. These advanced producer services and financial service corporations coordinate economic activity and generate flows and exchanges of information and services (Amen et al. 2012, 23). While flows know no borders, they are nevertheless attracted by hubs and nodes, where they [re]emerge and touch ground in cities (Segbers 2012, 37). Several cities in the Global North rose to prominence due to their disproportionate share of firms that articulate these flows, elevating their status into world cities, the command and control centers of the capitalist world-economy. These command and control centers are populated by decision-makers who direct the *where* and *how* of capital flows, product design, and the manufacture of a commodity from start to finish.

Decisions influencing the direction of capital, production processes, and commodity chains are manifestations of power and control. Corporations operate through multi-office urban networks to more efficiently service clients and maintain brand integrity (Taylor, Ni, and Derudder 2011, 4). Albeit an indirect measurement of flows, the interlocking network nevertheless places an emphasis on the sizes of offices in cities: the larger the office, the greater the flows of goods and services it generates,

which then tends to indicate that cities with larger corporate offices would exchange greater amounts of information and knowledge than cities with smaller corporate headquarters (ibid.). For instance, law firms make available inter-jurisdictional contracts, or advertising agencies devise global campaigns for individuals and groups patronizing their services, thereby interlocking cities “through the flows of information, knowledge, and personnel between project-relevant cities.” Non-economic interlocking transpires through foreign service offices, UN agencies, and non-governmental organizations (Taylor 2005, 707). These sub-nodes correspond to inter-state, supra-state, and trans-state actors, respectively. Interlocking networks of cities, then, do not pertain only to a deployment of economic power, but also political power through webs of country missions and diplomatic personnel and social movements and grassroots organizations. The deployment of political power is in the form of information and knowledge exchange facilitated by enhancements in telematics.

Recent scholarly work on cities has focused on airline networks (Grubestic and Matisziw, 2012), spatial Internet networks (Malecki, 2012), or media centers (Watson and Hoyler, 2011). This is demonstrative not just of the interest in this fledgling research agenda, but also, and more importantly, on the empirical phenomena evinced by world city networks. Urban networks of varying forms abound, testifying on behalf of the relationality of cities in general and the empirics of their interactivity, more specifically.

1.6 Global Commodity Chains, World Cities and the World-Economy

The interdependencies of cities are not just predicated on advanced service producers. The production of physical goods, or commodities, remains vital to the

neoliberal capitalist world-economy. More importantly, the production of commodities is not confined to a single geographical area. Like services, they are interconnected through commodity chains, which are both linked through cities and nexuses of power and control.

The term ‘commodity chain’ was first introduced into the lexicon of the world-economy by Hopkins and Wallerstein (1986). In their seminal piece, they define a commodity chain as “a network of labor and production processes whose end result is a finished commodity” (Hopkins and Wallerstein 1986, 159). In network terms, commodity chains could be conceived of as having a number of nodes making up ‘pivot points’ in commodity transformation sequences, including the extraction and supply of raw materials, stages of industrial processing, export of goods, and final marketing (Gereffi and Korzeniewicz 1990, 51-2). Each node is linked to other nodes of related activity, creating a web-like structure of GCC connecting local, regional, and world economies to form spatially bound structures (Smith and Mahutga 2009, 67).

Brown et al.’s (2010, 30) meticulous illustration of the world city network in commodity chains elucidates, in concrete terms, the relationship between flows and nodes. Employing their example of the connectedness of Mexico City and Santiago de Chile in hypothetical terms, four types of flows [commodity chain, production inputs, service provision, and distribution] and three nodes [cities in networks of final, middle, and initial production] are involved in a single commodity chain linking both cities. The commodity chain begins when a firm supplies raw materials and production inputs go into a good’s initial production. At this point, city A is already involved in the commodity chain. It could conceptualize the product, for instance, or provide

capital for its design. As the good moves into middle production, city B can provide risk management services and quality control measures alongside other production inputs supplied by the firm. When the good reaches final production, cities A and B both provide services, possibly through marketing or advertising. Subsequently, the finished product is distributed in both cities.

The intricate web of flows and nodes is wrought with power relations and asymmetries. In a larger model involving more cities and commodity chains, corporations and service providers in cities compete for opportunities to service commodity chains. The chain is resource and raw material extraction. There are striking similarities between extractive economies and low-wage manufacturing sites, for instance, which rekindle a coercive core and a dependent periphery (Smith and Mahutga 2009, 68). Even before the actual commodity chain is linked to the world city network, cities vie for capital, and corporate investments through neoliberal policies of competitiveness and profitability in a virtual marketplace of developed and less developed urban agglomerations. In buyer-driven commodity chains, large retailers and brand-name merchandisers play a “pivotal role” in configuring networks of decentralized production networks, usually in Third World export processing zones where production is carried out and finished goods are made (Gereffi 1994, 97). In producer-driven commodity chains, transnational companies and large industrial enterprises involved in the automobile, computer, aircraft, and electrical machinery industries control the production system of commodity chains, creating a more economically varied geography of services (*ibid.*). Cities compete for the offices of these TNCs and retail companies, and in the process compete for power and control.

This dissertation focuses on the distribution side of the global commodity chain. Air freight is one of the ways in which commodities are distributed through airports and cities. This dissertation also examines the city as the nodal side of the global commodity chain, but makes no claims about where it is in the production phase, as Brown posits.

1.7 Plan of the Dissertation

The next chapter appraises the literature on cities. A key contribution this chapter attempts to make is to thematically categorize the multitude of urban theories based on a model by Rossi and Vanolo (2012). Chapter 3 focuses more specifically on the idea of the aerotropolis, linking airports and urban growth, and detailing two schools of thought that underpin this work: world systems analysis and the product life-cycle theory. Chapter 4 details the two methods the dissertation uses: a case study comparing Detroit and Doha using the Most Different Systems Design, and multiple linear regression. Chapter 5 delves into the cases of Detroit and Doha. Here, their similar growth spurts, differing economic and demographic trajectories, and some of the reasons for their demise and rise, respectively. Chapter 6 presents the results of the eight multiple linear regression models ran to test the hypothesis that air freight leads to demographic, economic, and geographic growth. Finally, chapter 7 analyzes the findings from the data analysis, posits three theories from the data, and looks into some theoretical and policy implications.

Chapter 2

APPRAISING THE LITERATURE ON CITIES

The broad literature on urban theory, or theories on cities, serves this dissertation two purposes. First, some of these theories will be referenced when the case study in Chapter 5 and data analysis in Chapter 6 are synthesized. Second, the multi-dimensionality of cities this chapter will demonstrate is important in informing a less mainstream yet pertinent school of thought the dissertation probes, specifically what I call the aerotropoli school.

Scholarly work on urban geography has always been concerned with “different ways of thinking about, defining, theorizing and researching the city” (Hall and Barnett 2012, 19). Descriptive, interpretive and explanatory concerns have animated the work of urban geographers over time (Hall 2006, 21). Abstracting these concerns through cognitive exercises to arrive at simplifications, generalizations and essentializations of empirical cases (Peet 1998, 3) has been and continues to be an indispensable part of the study of urban geography.

Against this intellectual backdrop, this research surveys the vast and impressive literature on theories of urban politics. Utilizing a slightly amended version of the “triad of urban politics” offered by Ugo Rossi and Alberto Vanolo (2012, 12-3), this exercise aims at arranging the multitude of contributions to theories of urban politics according to the three major themes they identify: politics as representation; politics as governance; and politics as contestation (Rossi and Vanolo 2012, 13-9).

This structure has been chosen as it evinces many of the evocative concepts urban political theorists have stressed.

The various abstractions, conceptualizations and schools of thought surveyed in this work have been categorized, to a large extent, according to theoretical themes several scholars identify with – positivism, humanism, structuralism, radical geography, postmodernism, postcolonialism and feminism (Hall 2006, 22-30; Pacione 2005, 33-8; Pacione 2009, 24-30; Peet 1998). This study also surveys other schools of thought that have not been explicitly subsumed into any of the aforementioned groups – urban regime theory, pluralism, elite theory, new institutionalism, neoliberalization, world/global cities approach, and theories of metropolitan and regional governance.

It is worth noting that categorizations and classifications such as these are in no way attempts at boxing in, or lumping together the scholarly trajectories of the sub-field. Nor do these groupings intimate that urban political theory is static and immovable. If anything, these configurations facilitate dialogues *within* and *among* each other. Such conversations will hopefully chart where the discipline is, what debates take place, and how representation, governance and contestation are demonstrated.

This chapter proceeds in three sections. The first section lays out the triad of urban politics, and what the politics of representation, governance and contestation concretely mean. The second part arrays the various approaches according to this triad. Owing to the dynamism of these logics, almost all of them each have contributions to the overarching ideas of representation, governance and contestation. For the purposes of this exercise, though, most of the approaches examined are linked with one of the three sides of the framework. The final part offers a rather broad

appraisal of where urban political theorizing is, factoring in the ideas and issues it focuses, and some of the gaps the literature exhibits.

2.1 The ‘Triad of Urban Politics’

In response to the uneven and unbalanced ramifications of processes of globalization on cities and regions (Rossi and Vanolo 2012, 9), Rossi and Vanolo propose a three-pronged framework that could integrate conceptualizations of and theorizations about the city with the rapid changes and developments it faces. They start with the premise that the city, broadly speaking, “is a multifaceted physical, relational and governmental space” (Rossi and Vanolo 2012, 18). They then develop an analytical triad of urban politics: politics as representation; politics as government (for which I substitute with the concept of *governance*); and politics as contestation. This section provides an overview of the points of emphasis of each of these modes of politics.

2.1.1 Politics as Representation

Marked by the respective logics of Derrida, Foucault and Said, the politics of representation has a wide array of implications on how cities view themselves and one another. “Annihilating” a social, geographical or cultural “Other” is accomplished through a politics of representation (Rossi and Vanolo 2012, 14). So too is a neoliberal discourse on rankings of cities according to economic competitiveness, which treats cities as homogenous units or “growth machines” (Molotch 1976) that act like private firms or individual agents (Rossi and Vanolo 2012, 14). Such representations are able to conceal deep-seated societal cleavages and inequalities, and they foster stigmatizations like “deprived” or “unsafe” cities, or based on discursive and

communicative mechanisms (Rossi and Vanolo 2012, 14-5) that warrant a closer and more intimate inspection.

2.1.2 Politics as Governance

The need to tweak the original terminology employed from government to governance is brought about by the very characterizations Rossi and Vanolo make. While acknowledging the “intellectual technologies and practical tools” exercised by formal authority (Rossi and Vanolo 2012, 15), they also extend government to include power relationships [re]produced by a variety of individuals and collective actors not necessarily linked with the state apparatus (2012, 15-6). This “governmental rationality,” then, moves beyond traditional forms of government to encompass self-governance by individuals, communities, and cities now tasked to pursue their own development goals and well-being, realms once located within the exclusive domain of state or authority (Rossi and Vanolo 2012, 16).

This conceptualization of “government,” hence, is captured more accurately by “governance.” Urban political theorists invoke governance to refer to, among others, the “multiplicity and growing diversity of interests and actors in changing governing arenas” (Davies and Imbroscio 2009, 8); broader and more comprehensive nexuses of authority and legitimacy that connect the state, economy and civil society (Healey 2011, 93-4); and more context-specific, informal horizontal networks working towards narrowing the divide between cities and suburbs (Savitch and Vogel 2009, 112). While retaining the logic driving the original conceptualization of politics as government, the complementary literature recommends a change in terminology from “government” to “governance” to capture more definitively that very same logic.

2.1.3 Politics as Contestation

Resistance to the reproduction of dominant images and administrative practices and policies distinguishes the politics of contestation from representation or governance, as the former seeks a more just and egalitarian city (Rossi and Vanolo 2012, 17). A politics of contestation is very much aligned with an emancipatory project, whether in the form of “the right to the city” (Harvey 2012, 3-25), calls for social justice (Harvey 1973 [2009], 96-118), or ruptures of oppressive societal and politico-economic relations. In any event, a politics of contestation coalesces around discontent with the status quo.

Before proceeding to the crux of this survey, it is important to note that the component parts of the triad of urban politics are not mutually exclusive. They are interrelated in many ways, rendering this endeavor quite challenging in that a particular logic or argument could belong to representation instead of contestation, or governance in lieu of representation, and so on. The triad will be employed here to highlight some of the major ideas that theory “x” or approach “y” offer towards illuminating each of the three themes outlined above.

2.2 Theories and Thought on Politics as Representation

An urban politics of representation in large part reflects the “poststructuralist turn in the social sciences,” which places an emphasis not only on empirically observable forces and dynamics of urban processes, but also the socially constructed meanings attached to these processes (Rossi and Vanolo 2012, 26). Post-structural urban politics is an “interpretive practice,” one that favors a process of lingering in order to unveil structures as not merely explanatory, but as means of producing ideas and realities so they become familiar as well (Kataoka 2009, 73-4). A key normative

position that separates post-structuralism from post-Marxism or even postmodernism is its divorce from the belief in progressive trajectories, which is relegated in favor of more critical trajectories (Kataoka 2009, 73).

At the forefront of the critique and reconceptualization of linear and “total” accounts of modernist thought is Foucauldian geography, which asserts that “the phenomena, processes and structures of history are always fragmented by geography – that is, things turn out differently in different places” (Peet 1998, 230). *A priori* impositions of grand historical visions are repudiated since they insist on measures of order that run contrary to the “confusions, contradictions, and conflicts that form the real stuff of life” (ibid.). In the context of urban politics, post-structural thought valorizes the “richness of the local and particular” (Hubbard 2006, 45), whether in the differing degrees of human attachment and community life in the suburbs of Bangkok (Jiraprasertkun 2012), the creative ways in which pharmacy owners entice prospective clients to purchase their goods (Simone 2010, 121-23), or bathing and laundry practices in Managua (Shillington 2012, 301-05). Everyday experiences are of greater significance to post-structuralists because they reveal subtleties and unique details that cannot be totalized by grand, modernist meta-theories.

Borrowing from Foucault, post-structuralism is also cognizant of power relations that are formed and reformed in the carceral city, which is situated in the capitalist domain and whose mechanisms are invoked over transgressions against the logics of commerce and industry (Foucault, as quoted in Kataoka 2009, 80). The carceral city, which is neither a generalized or typical city, invites an awareness and acknowledgment of other cities, and the different power relations and mechanisms they induce (Kataoka 2009, 80).

The “other cities” and their attendant heterogeneity are crystallized by postcolonial approaches to urban politics. A postcolonial stance is to some degree akin to post-structuralism insofar as it critically engages with both the representations, images and vestiges of colonialism in former colonial possessions, as well as the cultural and ethnic hybridity brought by migrants from erstwhile colonies into developed cities like London, New York and Paris (Pacione 2009, 30). This approach raises themes such as diaspora, creolization, transculturation and even borders (Jacobs 1996, 13). Postcolonial critiques are sensitive towards the diversity of urban experiences around the world (ibid.), and aim at challenging the “totalizing Western historiography [in an] attempt to destabilize the Western canon” (Sharp 2003, 59) and “Western geographical imaginations” (Hubbard 2006, 43).

Another way in which politics as representation is made manifest is through scholarly classification and categorization of cities according to their positions in the global economy (Stren 2009, 158). The literature on world or global cities is vibrant and rich (Beaverstock, Smith and Taylor 2000; Braudel 1984; Friedmann 1986; Knox 1995; Sassen 2001a; Sassen 2001b; Taylor 2004). Instead of treating “hypermobility, global communications and the neutralization of place” and as givens, the concept of a global or world city is deployed to account for the production of capabilities for “global operation, coordination and control” (Sassen 2011, 55). Global or world cities such as New York, London, Tokyo, Paris, Frankfurt, Zurich, Amsterdam, Los Angeles, Sydney and Hong Kong have “accumulated immense concentrations of economic power” by way of the “intensity of transactions among [them]...through...financial markets, trade in services, and investment” (Sassen 2011, 58). Emerging cities in the capitalist world economy that exhibit “global network

connectivity” also include Chicago, Madrid, Milan and Singapore, themselves constituting integral nodes in a world city network (Taylor 2004, 69).

Global cities, though, are not just empirical phenomena. They are ranked and designated according to exceptional characteristics (Robinson, as quoted in Stren 2009, 160). They are representations to be emulated, so much so that so-called “wannabe global cities” (Rossi and Vanolo 2012, 38-40) have emerged with their respective discursive slogans. Atlanta is “the next great international city,” Johannesburg calls itself “an African world class city,” and Helsinki proclaims it is “an international city” (Paul 2005, 2105).

The limitations of global or world cities, however, arise when unique political characteristics are set aside to give way to particular economic considerations, which ensure that most cities in Africa, Asia and Latin America are left out of the discussion (Robinson, as quoted in Stren 2009, 160). Cities in the Global South, instead, become “‘problems’ in relation to Western understandings of urban life” (Edensor and Jayne 2012, 3). Just like constructs of global/world city-ness, Third World cities experience concrete phenomena and are subjected to problematic representations. Beyond the glitz and glamour of global and world cities lies a myriad of slums. Mumbai is the “global capital of slum-dwelling,” with Mexico City and Dhaka not far behind (Davis 2006, 23). “[T]he principal function of the Third World urban edge remains as a human dump” (Davis 2006, 47). Such emphases on economic or financial incapacity, widespread poverty and underdevelopment are flipsides of “[c]onceptual and theoretical approaches and frameworks that have their roots in the North [and] are used to frame and explain the South” (Rigg 2007, 4). Frames of reference that concentrate merely on global trade and foreign direct investment obfuscate the role

Third and “Fourth” World cities play in the world economy, given both their desire to attract investments and heightened exposure to flows of information, people and goods in an age of enhanced telecommunications and technological innovation (Shatkin 1998, 380-82). Also lost in the process of [re]framing is a shared “search for strategies that address particular practices of inhabitation, livelihood formation, spatial diversification, and social contestation” which, while not totally unknown to the Global North, “assume a different kind of importance” (Simone 2010, 15) in the spaces of Dakar, Abidjan, Kinshasa, Phnom Penh and Jakarta.

Alternative representations like those presented above, nevertheless, are contested and subjected to intense scrutiny primarily by postmodern thinkers. Binary oppositions such as West/Third World, world city-ness/outside the West (Robinson 2002, 531-32), West/East (Hubbard 2006, 43) and I/You (Peet 1998, 224), require a “Thirdspace” to displace either/or choices reflective of binaries in favor of “both/and also” logics. Inclusive logics facilitate the quest for political remedies to the multifaceted dimensions of inequality and oppression brought about by global restructuring (Soja, as quoted in Peet 1998, 224-225). This “both/and also” rationale is seen as a counterpoint to discredited development discourses and practices that have been force-fed to two-thirds of the world’s population, resulting in “massive underdevelopment and impoverishment, untold exploitation and oppression” (Escobar 1995, 4).

Skepticism over Western-initiated modernist projects like modernization, developmentalism and inevitable human progress is expressed in the “linguistic turn toward discourse, text, reading, and interpretation” (Peet 1998, 232). The notion of a text, for post-structural scholars, is expanded so that social, economic and political

institutions could be “read” as “signifying practices” (Barnes and Duncan, as quoted in Peet 1998, 233). Like texts, reality could and should be subjected to critique. Post-structuralists, in particular, encourage a deployment of critiques toward the purported object of inquiry of urban studies, re-politicize culture, and decenter power from physical space (Kataoka 2009, 82-3).

Post-structuralist sensitivities are shared by postmodern thought, notwithstanding their differences and the observation that urban geographers principally use “postmodernism” to denote a type of Western city that responds to the changing political, economic and social landscapes of the turn of the 21st century (Hubbard 2006, 50-1). Postmodern geographical thought, or at least a variant of it, is concerned with “the proliferation of difference, the decentering of the social subject, the plurality of subjectivities and the end of pre-unitary views of emancipation” that need not forsake the reimagining of alternatives to neo-liberal and capitalist power relations (Slater 2003, 77). In addition, postmodern acuties are associated with innovative and ingenious ways of framing spatiality, its heterogeneous local specificities and differences, and pluralities (Slater 2003, 78) within and between cities, all of which bring to the fore a sensitization of the peculiar “needs and situations of all members of a society” (Pacione 2009, 28). Under the remit of decentering lays an insistence among postmodernists on revalidating the significance of local economies and resources (Simone 2012, 39-46; Slater 2003, 79).

An appropriate segue that links politics as representation to governance is underscored by sociological institutionalism, a fusion of interpretive policy analysis and relational geography (Healey 2011, 90). The nexus of representation and governance is manifested by sociological institutionalism’s consideration of “socially

constructed work of creating policy meanings and frames, and the way in which such work is embedded in socially situated trajectories of experience and understanding” (Healey 2011, 92). Urban policy is framed according to changes in governance landscapes such as large firms, trade unions, and policy-driven modes built on core values such as bureaucratic principles and technical expertise (Healey 2011, 96). Recognition of these facts creates fluid urban governance landscapes that are open to transformation. The interstice of representation and governance is located in these possible transformations, which involve struggles over meanings, resources and regulatory authority (Healey 2011, 101).

Theories and thought on urban politics as representation shed light on the intricacies of identity-construction and formation, difference and heterogeneity, and unique everyday urban experience. They also zero in on “macro” processes such as financial and economic competitiveness, but ground these on rankings, designations and brandings in the form of global, world, or wannabe global cities. These representations also bring to the surface the question of their “opposites:” slums, underdevelopment and similar conditions in the Global South. On the one hand, these cities are problematized by Western discourses on “exemplary characteristics” that most global/world cities possess. On the other hand, they are also called into question, either by strands of thought that cast serious reservations on dualisms and binary opposites, or unique practices that incorporate hybrid identities found in the intersections of the postcolonial and postmodern. Such urban representations have evoked intense mechanisms and strategies of governance in their broadest and most expansive forms.

2.3 Theories and Thoughts on Politics as Governance

The underlying premise of a politics as governance is “the rise of neoliberalism as a dominant form of societal government in the North and in the global South,” aptly propped up by processes of “urban neoliberalization” (Rossi and Vanolo 2012, 72). As mentioned earlier, governance, even of the neo-liberal form, is not predicated exclusively on elected or formal sources of authority. As this section aims to illustrate, horizontal governance arrangements also operationalize a neo-liberal logic, which is persistently made and remade by a multiplicity of actors and relations.

Leading one of the earliest movements in urban geography was positivism, an ontology with a tight-knit adherence to rigorous hypothesis testing, statistical inference, and theory construction that would later undergird the spatial analysis school (Pacione 2009, 26). These tenets were substantively backed up by the neo-classical belief in the rational, utility-maximizing *Homo economicus* (ibid.; Hall 2006, 24). Positivist approaches were also widely recognized as appropriate responses to rapidly evolving socio-economic circumstances, like urban migration and suburbanization (Hall and Barnett 2012, 40), or capital accumulation in a central business district. The ecological urban models propounded by Burgess’ concentric zone model of urban land use were based on a series of assumptions: private ownership of property and economic competition for space; expensive and limited space in the city center; cheap housing for factory and shop workers in the central business district's (CBD’s) contiguous peripheral zones; and no historic remnants of earlier land-use patterns in any district (Pacione 2009, 140-42). One of the more influential responses to Burgess’ theory was Hoyt’s sector model of urban land use. Hoyt’s traced the outward movement of wealthy residents into land not used by industry and secure from the threat of natural disasters, leaving low-income city

dwellers to occupy inner-city and decaying apartments vacated by high-income earners (Pacione 2009, 142). Both cases were arguably concrete endeavors aimed at a study of space as regularity, quantifiable through pure and simple distance, in harmony with modern mathematical science (Peet 1998, 20).

The urban models produced by the likes of Burgess and Hoyt are products of the interaction between economic, cultural and political factors (Fainstein and Campbell 2011, 5). Theories and thoughts on urban politics as governance seek to trace the contours of these factors, much in the same way that positivism did. The literature on neoliberalization does offer some substantive insights on the mechanisms of neoliberal societal governance. Neoliberal doctrine puts a premium on freeing rational individual actors from formal obligations, which allows them to pursue utility-maximizing interests in the context of a minimum set of regulations and norms (Rossi and Vanolo 2012, 72). Neoliberal policies also have a naked predisposition towards capital, with formal authority simultaneously getting out of its way [*laissez-faire*] and facilitating its entry [*aidez-faire*] (Purcell 2011, 44) to further the geographic and sectoral expansion of the market economy (Rossi and Vanolo 2012, 72).

Consistent with this “help-out-or-get-out-of-the-way” dogma is the pairing of neoliberal policies with democratic ideals to cover for democratic deficits at the local level, which can be seen, for example, in the execution of infrastructure projects in cities by boards appointed by the city governments (Purcell 2011, 45). The prearranged marriage between neoliberalism and democracy ushers in the recognition of the need for social and political equality, which are values the latter celebrates. Yet, problems of social inequality, which even positivists and their classical urban models demonstrate, exist side-by-side with *de jure*, formal political equality, a predicament

further exacerbated by the city authorities' displacement of redistributive social policies to remain economically competitive (Mossberger 2009, 41; Purcell 2011, 46-7).

Other approaches to urban governance are cognizant of, and have grappled with, this tension. Pluralist theories of urban politics are concerned with fragmented and decentralized power that extends beyond formal institutional structures and elective positions, and is dispersed unequally to groups in society to effect varying political outcomes reflective of different policy sectors, all of which help bind participants to the otherwise uncertain outcomes emanating from the disaggregated nature of decision-making (Jordan 1990, 293). Despite its many modifications, pluralism in its broadest sense prefers Western liberal democracy to its alternatives in order to ensure, theoretically at least, that no minority suffers from exclusion and cumulative inequalities (Judge 1995, 16). Pluralism focuses on “who” makes important decisions, and “how” these important decisions are made (Judge 1995, 17). The core question that incessantly animates pluralist thinkers is whether social pluralism, or the number of groups and actors, is correlated with political pluralism, expressed as the way power is diffused across groups and actors (Judge 1995, 24).

In many respects, pluralism in its most general sense bears close resemblances with regime theory. A regime “connotes a set of governing arrangements, and in its usage over the past few decades, it indicates collaboration across institutional boundaries – beyond the formal apparatus of government in the case of urban regimes” (Mossberger 2009, 41). Regime theory is predicated on the interdependence of governmental and non-governmental forces for meeting the challenges of cooperation (Stoker 1995, 54). Regime theory's conception of power as social

production – “power to” instead of “power over” others (Stone 1989, 229) – is seen in its treatment of government institutions, regarded as givens that are “subject to some degree of popular control and an economy guided mainly but not exclusively by privately controlled investment decisions,” yet vulnerable to “business control over investment decisions and resources central to societal welfare” (Stoker 1995, 56). This “systemic power,” held by industries and corporations, however, is not deterministic insofar as urban decision-makers possess “relative autonomy” (ibid.) in its midst. The tie that binds these two theories together is the stress on cooperation across sectors to fulfill policy goals. A case in point illustrative of collaboration between various stakeholders is Atlanta, where White downtown business groups, Black middle-class organizations and elected officials from successive administrations formed coalitions to accommodate both an emergent African-American electorate and the corporate hierarchies that advanced racial progress (Mossberger 2009, 42-3). Regime theory, though, is not insulated from accusations of acting as apologists for economic growth at all costs. Among the noteworthy critiques lodged against regime theorists, is that they are mere extensions of the pro-growth or the urban-growth-machine perspectives (Pacione 2009, 419).

Both pluralism and, to an extent, urban regime theory, were reactions to elite theory, which stems from a hierarchical configuration of societal relationships and is oriented towards relations between rulers and ruled, powerful and powerless (Harding 1995, 35). Interestingly, one of elite theory's first forays into urban politics was through an analysis of Atlanta, the same city pluralist scholars examined. Contra pluralist and regime theory assertions on the interplay between and across various actors, a study conducted in the early 1950s revealed that those same actors found

themselves in crowds whose leaders were high-level senior executives of key Atlanta businesses (Hunter, as quoted in Harding 1995, 38-9). This conclusion has been attacked by pluralist theorists mostly on methodological grounds (Harding 1995, 39). The growth machine hypothesis celebrated the role of “politically mobilized elites” in the furtherance of economic growth in “virtually any given locality” in the United States (Molotch 1976, 310). More precisely, and as if to validate the key positions of elite theory, the growth machine hypothesis suggests that the governmental level, from which action emanates, is “at least one level higher than the community from which the activism springs” (Molotch 1976, 312). While elite theory would arguably not lend credence to the growth machine assertion that even corporate decisions are at the behest of governmental action (*ibid.*), it is obstinate in its standpoint that coalitions of businesses and governments in cities (Harding 1995, 45) make the key decisions in a neo-liberal urban context.

Elite theory and the growth machine hypothesis lump power and the ability to shape capital and growth into the hands of a few influential actors. While this does not deviate from one of the chief positions of a politics as governance, namely, the pervasiveness of horizontal arrays of governance, it is the polar opposite of another influential school of thought in urban politics, one that accommodates an increased scope of decision-makers within particular arrangements.

Proponents of institutions and, more specifically, new institutionalism, share similar premises with those advanced by pluralism and urban regime analysis. They articulate ideas that allude to the social production of power, its diffusion, fragmentation and decentering, as well as a more expansive conceptualization of government. There is a consensus among urban institutional theorists when as defining

institutions. They not only refer to binding regulations promulgated by formal bodies, but also to informal rules, values, relationships and practices that are stable and accepted (Lowndes 2009, 93; Wolman 1995, 135). New institutionalism, in particular, accentuates the durability of institutions and the potential difficulties confronting those that try to amend or even overturn them. Because institutions are processes, they benefit some people and leave others out. Beneficiaries will most likely work to maintain these institutions, which are also path-dependent and have the capacity to coopt dissenters (Lowndes 2009, 97). New institutionalism, furthermore, claims to elucidate urban politics in three areas: overarching rules of urban politics and governance; the complex nature of urban governance environments; and the contested and uncertain nature of change within urban politics and governance (Lowndes 2009, 94).

The main question for urban institutionalists, then, is whether or not existing formal institutions promote appropriate values (Wolman 1995, 135). These values differ from one country to another, a variation mostly mirrored by urban areas in these nations. Local governance in the US was found to be plagued by a clash of values between the National Municipal League, which advocated efficiency and economy, and interest groups that championed more traditional ideals like pluralist democracy (Wolman 1995, 144). By contrast, debates in Britain coalesced around configurations of local governments and their failure to efficiently provide services (Wolman 1995, 149).

Altered perceptions on what constitutes institutions are indeed signs of fast-changing times. In the same vein, another response to the evolving notion of the city is captured by theories of metropolitan or regional governance. New regionalism

highlights metropolitan governance, or informal horizontal networks geared towards narrowing the disparity between the city and its suburbs (Savitch and Vogel 2009, 112). The prevailing neoliberal ethos has pulled metropolitan governments into the marketplace. Competition for cost-effective and efficient services is fostered by decentralization, prompting them to continue providing services like garbage collection, while at the same time contracting out production in the name of efficiency (ibid.).

Metropolitan and regional governance literature speaks to an equally remarkable reconceptualization of space: the rise of city-regions. Though akin to metropolitan areas, city-regions differ in that their form and makeup are shaped by local processes of territorial and political amalgamation that typically integrate a less densely developed hinterland, the overlapping of contiguous urban areas, or even synergy networks of geographically proximate cities that transgress national borders, like Copenhagen-Malmö, San Diego-Tijuana and Singapore-Johor-Batam (Scott 2001, 3-4). Governance issues arise to respond to such developments. Although still in its nascent stages, initial governance responses include the concept of a development coalition, “a place-based interclass coalition dedicated to economic development in a specific location” that relies on five factors: culture, institutions, leadership, social composition, and external relations (Keating 2001, 379). Whatever the make-up or type of city-region that surfaces, or has already come to the fore, its corresponding governing arrangement is expected to effectively come to terms with the extant logic wielded by neo-liberalism.

Urban theories on politics as governance alert scholars and practitioners alike to more comprehensive techniques and relations of governing. The concept of urban

governance has been broadened to account for not only traditional, vertical set-ups, but horizontal relations as well. It is meticulously appraised to identify and characterize specific sources of governance and the apparatuses utilized to maintain relations of governance not limited to those between governing and governed within the dominant and overarching calculus of neo-liberalism. But, as Foucault says, “[w]here there is power, there is resistance” (1978, 95). Such resistance is vivified by urban politics as contestation.

2.4 Theories and Thoughts on Politics as Contestation

Contestation and related calls for justice in the city can be seen as concrete rejoinders to the ascendancy and consolidation of the neo-liberal power project (Rossi and Vanolo 2012, 132). Urban dissent and resistance take on multifaceted forms. Equally significant are the various and diverse theorizations deployed in the name of alternative urban imaginations.

One of the most influential and polarizing strands of geographical thought is Marxism. Notwithstanding its countless variants, Marxism’s central maxims include the supposition that each society is built on a mode of production – institutional practices societies subscribe to in order to organize productive activities, provide material needs and perpetuate the existing socio-economic structure (Pacione 2009, 27). This mode of production is sustained by what regulation school theorists term modes of regulation: social, political and cultural arrangements that fortify and help secure the compatibility of production and consumption processes in the dominant mode of production (Painter 2011, 25-6).

Against this intellectual backdrop, Marxist urbanism has taken on humanist, structuralist, and classical varieties, stressing, respectively: the lived and alienated

everyday experience of urbanizing capital; the interventionist local state that is an object of protest from urban social movements; and the appropriation of land for rent, construction, [private] property, finance and landlordism (Geddes 2009, 56-7). Marxist geography's deep commitment to use power, tethered to the persuasive and purposive desire "to change society completely and for ever" (Peet 1998, 93), is tied to its normative pledge not just to understand the world, but to change it (Geddes 2009, 55). Its main contribution to urban theory, and contestation, lies in its scrutiny of production and "the creative potential of labor in the production of existence" (Peet 1998, 110). Marxist geography's view of societal relations as unstable – between people, and between society and nature – accords social reality a "structured coherence" that is always subject to change and transformation (ibid.). Perhaps most importantly, politics is not perceived to be epiphenomenal, but functions to perpetuate capital accumulation (Pickvance 1995, 267).

Structuralist Marxism, particularly, has engaged some of the key questions of urban life. Structuralist thought affords the local state, or local authorities, greater autonomy from the state itself, in contrast to instrumentalist Marxists, and see it as performing interventionist functions like urban planning, the organization of labor power, or provision of consumption facilities (Pickvance 1995, 257). The local state, then, becomes a constant target of protest from discounted urban social movements, which demand a betterment of the means of collective daily existence (Peet 1998, 126). Mired in crisis, the local state incessantly tries to intervene in urban affairs to cushion the stiff resistance it faces (Pickvance 1995, 263).

Local governments can only do so much, though, as their interventions, whether in urban planning or labor reorganization, are examples of modes of

regulation [or governance] geared at sustaining the broader regime of accumulation [i.e. capitalism] in operation. Regulation theorists have oriented their scholarly agenda towards these two central concepts, which were animated by an inquiry as to why the crisis-ridden nature of capitalism has not ultimately led to "constant actual crisis" (Geddes 2009, 62). While regulationists are split on whether or not the contemporary global political economy has entered into a single and distinctive post-Fordist mode of regulation, they are in agreement that the current Fordist mode of regulation – one of mass production that creates economies of scale and productivity growth to allow wage increases that sustain mass consumption (Painter 2011, 25) – is in crisis. In the American context, federal policies encouraged suburbanization, which pushed upper-class residents to the suburbs and left sizeable portions of the working class in peripheral inner cities (Painter 2011, 30). Coupled with the retreat of the welfare state, local governments experienced enormous fiscal stress as they struggled to deliver social welfare provisions for the urban poor, precipitating a Fordist crisis.

Structural Marxism also takes into account large-scale, macro processes marked by inequalities. Uneven geographies of development are just one example of such inequalities. An uneven geography implicating cities through the generation of global production services is the new international division of labor (NIDL). The NIDL emerged in the 1970s due to reduced profitability in Europe, increased production costs, cheap production costs in less developed countries, encouragement given to urban-industrial growth by international financial institutions, developments in communications technology, and heightened mobility and flexibility of finance (Potter et al. 2008, 76). The NIDL reflects a hierarchical social division of labor within big firms that disaggregated control and operational activities (Knox, Agnew and

McCarthy 2014, 78). The NIDL led to a deindustrialization of core countries, marked by global shifts of manufacturing to peripheral regions of the world that did boost the economies of East Asian states (Smith 2012, 240-41). Furthermore, it entailed the movement by firms of their industrial production processes to poorer areas of the world, primarily because of cheap labor (Pacione 2005, 634; Taylor, Ni, and Derudder 2011, 2), as well as encouragement by international organizations and state governments “anxious to bring employment to burgeoning Third World cities in order to forestall possible political instability” (Pacione 2005, 633-34). Transnational corporations benefited from low wage costs, governmental tax concessions, and, oftentimes, insulation from national labor regulations (Pacione 2005, 389).

Labor, a primary factor in the production of services, has taken on a geographical identity determined by capitalist networks of firms. At one extreme, core or world cities, in Friedmann’s seminal piece, “*basing points’ in the spatial organization and articulation of production and markets*” (Friedmann 1986, 71; emphasis original), require more white-collar, highly skilled labor. World cities are the centerpiece of an international spatial division of labor reliant on a continuing supply of “highly skilled professional and managerial, technical and scientific, and creative labour to meet labour market demand and, ultimately create value for the firm” (Beaverstock 2012, 241) At the other extreme, peripheral cities are integrated into the world-economy in large part due to the abundance of cheap, less skilled labor. By separating control from operational activities, firms have taken advantage of the creation of export-processing zones – labor-intensive manufacturing hubs that import raw materials and export factory products – as a cost-effective response to the NIDL, and to service debt (Pacione 2005, 389). This does not imply the absence of low

skilled labor in core metropolises, or a total dearth in highly skilled workers in Third World cities. Nevertheless, the overall picture the NIDL reflects a geographically-bifurcated global economy of laborers.

Across the pond, the new left in London, which also witnessed Fordist crises of its own, saw an opportunity for a transition to a more progressive post-Fordist mode of regulation in the form of flexible specialization and a restructuring of labor to protect communities from the worst effects of capitalist crisis (Geddes 2009, 64). These calls echoed the broader alternatives the new left in Western Europe desired: a radical extension of democratic participation, and calls for the transformation of bureaucratic apparatuses to enact a platform of policies that included transport, planning, health and education (Geddes 2009, 63). In England, such movements were ultimately defeated by the Thatcher administration, which towed the neo-liberal line of decapitating all forms of social solidarity in favor of privatization, individualism and personal responsibility (Harvey 2005, 17).

Dissenting voices not necessarily aligned with Marxist predispositions have resonated from feminist approaches to urban politics. Notwithstanding the numerous variants of feminist thought, they all see local politics being shaped by gendered social and economic relations (Clarke, Staeheli and Brunell 1995, 207). Feminism invests heavily in the avowal that an integration of marginalized groups cannot be disentangled from the chief goal of removing gender and sexual hierarchies in an inclusive city (Garber 2009, 207-08). Such an activity makes use of attempts at taking transformative political positions (Peet 1998, 250) without essentializing sexual differences as natural and timeless (Sharp 2003, 61-2) because of the primacy on dismantling hierarchical dualisms (Garber 2009, 206). Heightened participation of

women in local politics, for instance, should be interpreted not only in “the context of gendered changes in employment structures and work regimes,” but also through realigned post-welfare state institutional arrangements and grassroots interest groups (Clarke, Staeheli and Brunell 1995, 211), all of which redefine politics and accepted, gendered notions about political activity (Clarke, Staeheli and Brunell 1995, 221).

Albeit less confrontational than Marxist and feminist critiques, a humanistic approach to the politics of contestation nevertheless evokes dissent towards epistemologies of positivist generalizations. Humanism supports augmentation of human awareness, agency, consciousness, and creativity (Pacione 2009, 27). Humanistic approaches initially drew from an eclectic mix of sources like paintings, films, photographs, novels, and diaries to challenge scientific claims of totalizing knowledge and celebrate deep and subjective relationships between individuals, groups and places (Hall 2006, 25). An accentuation of practical knowledge, familiarity, care, and care-taking deliberately awakens an understanding committed to humanitarian objectives and, in the process, renders humanistic geography “intellectually radical” (Peet 1998, 63).

Marxist, structuralist, regulationist, new left, feminist and humanistic urban thinking are arguably linked together through demands for social justice. As there is no “one-size-fits-all” understanding of social justice, an apt starting point for its understanding necessitates a broad operationalization and concrete examples. Social justice begins with a “skeleton concept of a ‘just distribution justly arrived at’” (Harvey 1973 [2009], 98), where a “socially just distribution of income” is to be achieved “at a territorial level...for the individual” (1973 [2009], 99). It is also framed according to narratives on public space, which could come to mean a host of spatial

and non-spatial agglomerations like streets, parks, the media, the Internet, shopping malls, and local neighborhoods (Smith and Low 2006, 3). A politics of the commons, for instance, evades the regulative power of the state to tax, implies a space outside the marketplace for community assembly and entails contestation over the power to distribute resources for the upkeep of public space (Blackmar 2006, 50-1). Critical urban theory has worked towards the possibility of a socially just form of urbanization (Brenner 2009, 198) that repudiates uneven political economic geographies marked by poverty (Sidney 2009, 172-77), racial inequality (Thompson 2009) and social exclusion (Murie and Musterd 2011). A cry for the “Right to the City” comes from the excluded, working classes, small business people, those directly oppressed, and alienated (Marcuse 2009, 190-91). The “just city” requires democracy, equity, diversity, growth and sustainability, even if one is trade-offs are necessary to some extent (Fainstein 2011, 124).

Approaches to urban politics as contestation do not constitute a hodgepodge of critiques aimed at fleeting or fad-like targets. They seek redress from structures considered oppressive, exploitative and manipulative. These structures are both tangible or physical, on the one hand, and impalpable or diffuse, on the other. Whether in the form of an interventionist state deemed incapable of providing for the most basic of human needs, or accepted practices that maintain profit-driven logics, or binaries that favor one sex over the other, and scales that exclude and alienate on the basis of social constructs, repressiveness necessarily opens up space for resistance.

2.5 Concluding Remarks

Urban political theory is alive and well. Ways and manners of reimagining, reflecting on and thinking about the city evince an inter-disciplinary and crosscutting

eclecticism that generates a deep knowledge reserve. These approaches seemingly have withstood the ever-evolving test that is its object of inquiry. The city is in constant flux, its borders made and remade, narrowed and extended, in an almost endless fashion. Modes of thought on the city, as evidenced by the array of approaches presented in this chapter, have so far kept pace with the changes characteristic of cities. This sense of optimism, though, requires a certain amount of temperance, expressed in two questions that incorporate some of the gaps the literature leaves.

First, would the relative dearth of theories unique to urban politics be detrimental to the study of the city in the long run, given the changing dynamics that underlie the urban? Many of the approaches presented in this chapter are appropriations of thinkers who had little to say about the city per se. Heidegger, Kant, Marx, Rawls and Sartre rarely, if at all, theorized about the city. In other words, are these theoretical appropriations guilty, to some extent, of conceptual stretching?

Second, is there a need for urban political thought as a whole to be more normative? Many of the traditions and approaches to cities discussed here were explanatory or descriptive. Outside of the more radical theories, which present an alternative “ought” or staunchly oppose the status quo, prescription was either tacit or derived. Considering the value-laden issues urban political theory comes to terms with, like power, governance, land use, capital accumulation, gender, uneven development, or poverty, would a “normative turn” enhance debate and discussions surrounding the city?

Such open-ended questions are the catalysts for the emergence of intense and thorough schools of thought on the city. The dynamism of these approaches ensures that conversations about the city will continue.

Chapter 3

LINKING CITIES, AIRPORTS AND URBAN GROWTH

The last chapter offered multi-dimensional and interdisciplinary characterizations of cities. While there is no single way to define a city, its multiple characteristics open many avenues for further theorization and empirical investigation. This chapter focuses on one of them: the link between cities and one of its vital installations, airports. Growth machine theorists and Marxists would have very different generalizations about the relationship between airports and cities. So too would be proponents of the “airport city” or aerotropoli. They may not number as much as more mainstream theorists, but airport city scholars do probe an important association that their counterparts pay little attention to.

This chapter seeks to situate the air freight-urban growth nexus in the broader field of studies that have explored its conceptual component parts separately, namely, via the links between airports, air freight, and even air passenger volumes on one hand, and the demographic, economic, and geographical growth of cities, on the other. Rather than merely summing what has been stated about these relationships, this part aims at bringing together the various works that have taken up these subjects through the lenses of their respective disciplines [i.e. air transport management, sociology, urban studies]. Collating and appraising pieces from such diverse fields is my attempt at laying the groundwork which my argument will revolve around, while filling a gap in the literature which thus far has yet to forge a direct link between air cargo throughput and urban growth.

The first part of the chapter surveys work linking air cargo and economic growth. There is a consensus among scholars that growth in the global air cargo sector is positively correlated with GDP and world trade. The question of causality, however, is another area that has also been explored. The second section introduces the role of airports in generating more robust and vibrant urban activity around them. According to this literature, some airports have developed city-like characteristics by themselves, while others have helped generate commercial, economic, and demographic changes around them. The final portion of the chapter elucidates the key theoretical frameworks on cities and trade that the dissertation uses: world-systems analysis and the product life-cycle theory. It is divided into three sub-sections. The appraisal of the foundational arguments of world-systems analysis is followed by a survey of the two primary approaches in studying global commodity chains: one that is more city-centric, and another that is more commodity-oriented. This particular survey aims at tying together world-systems, cities, and commodity chains. The final sub-section identifies key tenets of the product cycle theory.

3.1 Air Cargo and Economic Growth

It is difficult to overlook the connection between air cargo and economics. Transport of goods by air accounts for only 1.8-3% of goods by tonnage/weight, but 35% to upwards of 40% of total value of moved goods, or over \$5 trillion per year (Morrell 2012, 23; Sales 2013, xvii). High value and time-sensitive commodities such as high-tech products, capital equipment, apparel, textiles, footwear, and other consumer products made up slightly less than 85 percent of all products transported by air in 2007 (Morrell 2012, 25).

Several scholars have pointed to a statistical correlation between air cargo volume and economic growth (Chang and Chang 2009; Kasarda and Green 2004, 2005). Kasarda and Green (2004) posit that there is a “well-established statistical relationship” between air cargo and GDP growth (2004, 2). Furthermore, they assert that knowing either world GDP or world air freight allows one to predict the other with 98 percent accuracy (*ibid.*). In the case of Hong Kong, they found positive correlations between air cargo, trade and GDP (Kasarda and Green 2004, 3). Correlation and causality, however, are two different things. Kasarda and Green argued in 2004 that air cargo growth and GDP growth “are, in fact, mutually causal” (2004, 2). However, they rely on a coefficient of determination to back up their position instead of higher-level statistical tests such as regression, which aim at exploring causality.

In a paper published a year later, this pair of scholars amends their language, stating that, in a study of 95 nations between 1980-2000, knowledge of air cargo volume enables the prediction of either GDP, or GDP per capita, “with over 90 percent accuracy – and vice-versa, given mutual causality” (Kasarda and Green 2005, 459). Chang and Chang (2009) critique these assertions by emphasizing the difference between correlation and causality. In their own analysis of air cargo and economic growth in Taiwan, they employ causality tests to conclude that bi-directional causality exists between air cargo expansion and real GDP during 1974-2006 (Chang and Chang 2009, 265).

Because air trade data is usually published prior to concurrent global GDP or trade data, it is often used as a proxy for turning points in world economic and trade cycles (Morrell 2012, 11). Frequently, though, it is not a leading indicator since air

freight levels move together with international trade (ibid.). During the 2008 world financial crisis, however, the link between air freight volume and economic cycles became more apparent as the decline in air cargo levels preceded reduced industrial production in the developed world. The latter, which is measured by the OECD through its ‘Composite Leading Indicator,’ is an index of industrial production published monthly and earlier than national statistics (ibid.). In May 2008, the OECD tallied an index of 100.3 before tumbling to the 90s until November 2009 (OECD 2015a). Air cargo, meanwhile, began to drop as early as January 2008 (IATA 2008), confirming Morrell’s observations about air freight leading the downturn in international trade by about “four to five months” (2012, 11).

To date, these studies reveal several key insights. First, attempts have been made at correlating air cargo and economic growth. There is a sufficient consensus to establish the fact that a positive relationship between the two exists. Second, several scholars have gone a step further by exploring causality and spelling out the directionality of the relationship. Third, air cargo is used as a proxy for macroeconomic processes such as trade and economic cycles. This last point is crucial as it conceptually frames the statistical relationships scholars have sought.

Studies on the economic impact of air cargo have not been limited to large-scale, global analysis. Researchers have likewise attempted to trace the effects of the air cargo industry on smaller scales. At a national level, 25 percent of the United Kingdom’s international goods move via air, including 55 percent of commodities exported beyond the European Union (FTA 2006; Oxford Economic Forecasting 2006, 2). Air freight also underpins the competitiveness of key British industries such as technology, business services, and pharmaceuticals (FTA 2006). On a state/regional

level, Maynard (2010), for instance, cites data from the state of Florida to highlight the relationship between air cargo and the state's economy. Official state figures, he says, indicate that air cargo in the 24 airports with scheduled air freight services is responsible for 69,260 jobs with an annual payroll of \$3.1 billion, generating an annual output of \$6.6 billion (Maynard 2010). Total air trade through Miami International Airport, which accounts for two-thirds of statewide on-airport air cargo-related employment, and 71 percent of off-airport jobs, was valued at \$40.7 billion in 2008, or around 96 percent of the entire state's total air imports and exports (ibid.).

Since urban employment is one of the dependent variables of this dissertation, it is important to draw up a causal chain connecting increased air freight and higher employment levels. Increased air cargo creates more job opportunities beginning at the airport. As freight increases, more people are needed to unload crates and boxes containing goods. These goods then go through handling and processing, which requires more individuals as well. The distribution side of the commodity chain likewise creates a demand for more jobs. More drivers and haulers would be needed by logistics companies to deliver freight to intermediate or final destinations. If the destination is intermediate, such as a factory where capital equipment is used, firms need workers to collect the equipment, store them in their firms' headquarters, and work on the capital equipment before being distributed by yet more workers to their next destinations. In other words, the causal chain demonstrates that air freight could generate jobs from the airport to the city and its hinterland.

Case studies on the effects of air cargo on cities, the principal point of inquiry of this dissertation, are quite numerous compared to larger-N, global analyses. Hesse (2014) compares and contrasts two air freight hubs that have unexpectedly developed

into vital commodity transport nodes: Luxembourg and Leipzig. Despite its size, the tiny Grand Duchy's Findel Airport has emerged as one of Europe's busiest cargo hubs. In Hesse's words, its emergence comes "almost accidentally" (2014, 346). But, he likewise offers a succinct story of how Luxembourg integrated itself into the dense global air transport network. Beginning with managing a niche commodity – an oil drilling commodity chain from Aberdeen, Scotland to Nigeria/West Africa – Luxembourg's proximity to decision-makers, business-friendly climate, and liberal market policies became conducive to the establishment of a fully developed air cargo airport (Hesse 2014, 344).

In response to the 2008 global financial crisis and the rise of other air freight hubs in Leipzig-Halle, Liège, and Cologne-Bonn, Luxembourg's policy network of state, corporate, and immediate stockholders has been prompted to adapt new strategies to remain competitive. One such response is the creation of a new 'Le Freeport,' opened in 2014 (Hesse 2014, 346) and adjacent to Findel Airport. The Freeport is a 22,000 m², four-story building with an investment of €55 million that serves as a VAT- and customs duty-free storage facility for ultra-high-end goods such as artwork, wines, precious metals, and vintage automobiles (Le Freeport 2015). As of 2014, Luxembourg-Findel Airport is ranked 7th in Europe and 33rd worldwide in air cargo throughput, receiving a shade above 708,000 metric tons of annual freight, representing a five percent increase from throughput in 2013, after years of decline since the 2008 economic crisis (ACI 2015; Hesse 2014, 345). Luxembourg's strategy is both novel and commonplace: airports serving cities seek creative and specific ways to secure comparative advantages over other cities as they reassert their nodal importance in a competitive global web of air cargo hubs.

Hesse then details the growth of Leipzig's Leipzig-Halle Airport (2014, 348-49). Its rise cannot be separated from the story of nearby Brussels Airport. In October 2004, DHL announced its decision to move operations from Brussels to Leipzig. Among the reasons behind DHL's move away from Belgium are noise regulations in the Brussels area, along with a perceived comparative advantage in a new location that offered a variety of subsidies and incentives to external investors and served as a locale for automobile companies and retail distribution sites (Hesse 2014, 348). A political motive is also seen as a motivating factor behind the decision. Corporate activities, for historical reasons, were being redirected to the eastern part of Germany since reunification (Hesse 2014, 349). DHL brought with it 2,100 jobs to Leipzig, but was met with 48,000 applications (ibid.), indicating the economic and demographic effects [i.e. movement of people to an area with new job opportunities] of a large air freight integrator's choice of a hub city from which to operate.

Case studies of airports and cities beyond the developed, industrial West are crucial to a more comprehensive understanding of the expanding global air freight network. A prominent example is Hong Kong. Zhang (2003) provides an in-depth account of the dynamics behind Hong Kong's position as an integral node in the worldwide air cargo network. He begins by detailing the former British colony's involvement in entrepôt trade, specifically through engaging in re-exporting commodities (Zhang 2003, 125). Hong Kong's re-export industry bred an environment conducive to the formation of a critical distribution node through its local [commodities distributed domestically], gateway [goods distributed to its manufacturing hinterland in southern China and the Pearl River Delta, most prominently], and hub [products distributed internationally] air freight links (Zhang

2003, 125-27). Hong Kong's Chek Lap Kok International Airport is the world's leader in air cargo throughput, receiving 4.16 million metric tons of freight in 2013 and 4.42 million the following year (ACI 2015).

Other similar studies attempting to forge the link between air cargo services and economics or finance have been conducted on as diverse areas as John F. Kennedy in New York City (NYC Economic Development Corporation 2013), Southeast Asian airports (Bowen 2000), Subic Bay International Airport in central Philippines (Bowen, Jr., Leinbach and Mabazza 2002), and Taipei-Taoyuan International Airport in Taiwan (Wang et al. 2011).

Two important takeaways from these works must be noted. First, scholars have analyzed and concluded that there is a *directional* relationship between air cargo load and the economic growth of cities served by airports, at least insofar as single-N or small-N cases are concerned: greater throughput leads to more vibrant economic and financial activity in cities and the regions those airports cater to. Second, these scholars bring in a very important conceptual and empirical tool: airports. Airports link air freight to its distribution, both analytically and in a first-hand, real-world sense. Moreover, airports are located in cities and/or their broader hinterlands; they almost always bear the name of the cities or city-regions they serve and are thus closely associated with them. This observation warrants the next subsection as authors grapple with theorizing and observing the relationship between airports and cities.

3.2 Airports and Cities

The capitalist economy's transition from large industrial complexes, blue-collar work, full employment, centralized management, and standardized goods to scope economies, flexible manufacturing systems, and new patterns of work is vital

(Amin 1994, 2, 17). It has prompted ways of thinking anchored on the preeminence of informational “spaces of flows” over physical/material “spaces of places” (Castells 2010). However, the contemporary, service sector-oriented world economy, which in large part hinges on high-technology logistics and freight distribution systems, also requires “certain material facilities, infrastructure and ‘space for operation’” (Hesse 2008, 2). Hesse is referring to physical and temporal space and place; more specifically, cities and urban development (2008, 3).

Three frameworks are crucial to understanding the relationship between airports and cities. The first is advanced by Hesse (2008). Describing the city as a “terminal,” Hesse’s main argument is that “modern logistics is shaping urban development and land use” as a consequence of the reorganization of supply chains and logistics network designs (2008, 3). Throughout his work, he stresses the ways in which logistics as a whole – not just initial distribution through air cargo transport – contributes to suburbanization as city centers are no longer equipped to handle the volume and time-space compression exerted by supply chains and distribution. More pertinent to this piece, however, are Hesse’s foundational arguments about the importance of the physical infrastructure underlying logistics. Lost in the shuffle of the narratives on globalization is “material space:” the demand for material connections between places and the infrastructure needed to enable such connectivities, which seem to inaccurately and erroneously dissolve into a virtual world of information transfer (2008, 33). Furthermore, logistics firms pioneer urban expansion insofar as stimulating commercial developments due to advantages in location and accessibility (Hesse 2008, 167-68).

Despite not having a specific focus on airports and their locations in cities, Hesse's main assertions are very applicable to airports and cities. Many major international airports are not located in city centers, although this trend has somewhat been reversed, especially in China. Also, these airports have likewise stimulated commercial developments within and beyond their vicinities. Most importantly, his piece establishes the centrality of physical logistics distribution sites and their relationship with cities and urban growth.

The two other works surveyed in this subsection are more explicit in their assertions about the connections between airports and cities. Terms like airport cities and aerotropolis have emerged to describe a seemingly inextricable link between airports and cities. Yet, these terms are by no means new. Conway (1977) was one of the first scholars to coin the term, "airport city." He grounds his analysis in both historical developments and trends at the time of publication of his piece to project the future of airport cities. Conway's opening arguments set the tone for the place of the airport city in the future. Each stage in the "history of development," he says, is "dominated by the principal mode of transportation of the time" (Conway 1977, 2). Conway refers to the stage of development he was writing in as "growing air transportation" (ibid.). And because airplanes have emerged as the primary means of transportation, they impact both land use and other modes of transport.

The city is front and center in these transportation developments, to the point that an airport's runway, for Conway, becomes its "Main Street" (1977, 212). He foresees different kinds of residential, industrial, and economic activity arising and flourishing around the runway (see Conway 1977, 214). Citing various developments across the United States, he concludes, "it is impossible for the big airport to escape

from the city” (Conway 1977, 246). Furthermore, airports display many characteristics that a city possesses; the airport manager acts as a “mayor” responsible for thousands of employees commuting to work at the airport and operates “typical city services” like emergency response, water and sanitation systems, concessions, and the maintenance of buildings and other infrastructure (Conway 1977, 249-50).

While not all of Conway’s prognostications came to fruition, his insights are still relevant to scholars and planners alike. First, as expounded on below, he has influenced thinkers who have built on the concept of the airport city to describe and explain 21st century developments. Second, the airport city Conway envisioned is not a fantasy. His central points on the airport city – a stimulus for economic growth, a magnet for commercial activity, and inseparability from the city¹ – are ongoing processes that continue to characterize the airport-city nexus.

One of the scholars Conway influenced is Kasarda, even to the point that one prominent media outlet mistakenly attributed the origin of the term to Kasarda (Baskas 2015). Extending Conway’s logic on increasing airport land use, Kasarda opines that airports themselves are developing into aerotropoli, or “airport-integrated urban economic region[s]” (2010, 17). In particular, airports have evolved from terminals with magazine shops, kiosks, and duty-free to shopping streets with brand-name retailers, upscale restaurants, and music, arts, entertainment, and cultural activities (ibid.). Some of the world’s newest and refurbished airports offer services that advanced capital cities have become famous for: cinemas in Singapore’s Changi International Airport, high technology video conferencing systems in Hong Kong International Airport, a clinic capable of serving 36,000 patients annually in the Frankfurt Airport, and banks lining the Beijing Capital International Airport (ibid.).

Aerotropoli have also become logistics hubs with facilities within and outside an airport's premises. The airports of Hong Kong, Shanghai, Dubai, and Frankfurt do not serve as headquarters to a specific air cargo integrator, yet host cargo terminals and facilities that rank in the world's top ten in terms of air cargo throughput in 2014 (ACI 2015). Hong Kong International Airport, for instance, has franchised each of its five first-tier cargo handling facilities and three second-tier centers to private corporations, which manage complexes ranging between 1.4 to 17 hectares of land (Hong Kong International Airport 2016) and extending well beyond the airport itself. HKIA is a quintessential example of an aerotropolis. In an airport city, form meets function: a sprawling structure blurring the borders of airport and city and facilitating the distribution of commodities globally with breakneck efficiency.

Its merits notwithstanding, the airport-city framework has its shortcomings. First, an integral aspect of the airport-city model – the state-of-the-art developments in airports in advanced capitalist cities – does not fully represent how airport cities are taking shape, especially in less developed cities. What major cargo airports in the less developed world have in common with aerotropoli in advanced capitalist cities is the generation of commercial and economic activity around the airports and into city or suburban limits. Major cargo hubs in Colombo, Ho Chi Minh City, Lima, and Manila mirror Conway's iteration more than Kasarda's. One of the key differences between their two versions lies in Kasarda's emphasis on consumer services offered *inside* the airport, a lot of which are not available in the aerotropoli of the less developed world.

3.3 Cities and Global Trade

Since the trade and distribution of commodities is a plausible conceptual proxy for global trade, the literature on cities, airports, and aerotropoli could be situated in

the broader texts of world-systems analysis and the somewhat differing but related traditions of global commodity chains [GCN] and world city networks [WCN]. This section flows from the logic above. The first part surveys some of the facets of world-systems and dependency theories that are pivotal to this piece. These include the three-tier structure of the world-economy², its permanence in the world system, and the possibility of moving in and out of particular tiers. The second part looks at work undertaken within GCN and WCN camps, as well the product cycle theory, and how they dialogue with world-systems thinking and cities.

3.3.1 World-systems and Dependency Theories: Key Concepts

Two historical and intellectual developments set the wheels of world-systems analysis in motion. First, world-systems analysis traces its roots from the French historical school, *Annales*, and its prominent members such as Lucian Febvre and Marc Bloch, and Fernand Braudel, its most well-known second-generation scholar (Peet and Hartwick 2009, 170). This iteration of world-systems thought stressed social history [particularly the material conditions of working people], structural factors or relative constraints, the long term or *longue durée* as a language for the social sciences, and relations among the economy, society, and civilization (ibid.). Braudel, especially, focused on the structural limitations on material and economic life, both of which proved to be conducive in studying the long-term history of the Third World and sweeping changes brought about by contact with the First World (Peet and Hartwick 2009, 170-71).

Second, the wave of modernization theories that attempted to account for disparities between long-established nation-states and their nascent, newly independent former colonies sparked critical responses from the world-systems and

dependency schools. Arguably the most recognizable modernization theory fashioned out of social evolutionism was Rostow's stages of economic growth. Here, he posits that all countries are on a path towards economic development, but differentiated by where they are specifically in the stages of development. According to Rostow, all societies are "within one of five categories: the traditional society, the preconditions for take-off, the take-off, the drive to maturity, and the age of high mass consumption" (Rostow [1960] 1990, 4). These unidirectional iron laws were applicable to every society despite the "uniqueness of each society...at each stage" ([1960] 1990, 2). The extant teleological "sweep of modern economic history" (Rostow 1959, 1) towards progress became an instant target for the *dependencia* scholars of Latin America, who had much in common with the *Annales*-inspired world-systems theorists.

One of the most influential pillars of world-systems analysis, Immanuel Wallerstein, has built on the earlier work of his French predecessors. Heavily influenced by the *Annales*, he offers a parsimonious defining characteristic of both a world- and capitalist system. A world-system is "a social system, one that has boundaries, structures, member groups, rules of legitimation, and coherence...made up of the conflicting forces which hold it together by tension and tear it apart as each group seeks eternally to remold it to its advantage" (Wallerstein [1974] 2011, 347). A capitalist system, meanwhile, is marked by the defining and systemic feature of ceaseless accumulation of capital (Wallerstein 2004, 23). Endless accumulation involves the accumulation of capital by people and firms in order to accumulate more capital in an incessant fashion (ibid.).

The resulting capitalist world-economy is anchored on the logic and praxis of production for profit, and products made to be sold in the marketplace (Peet and

Hartwick 2009, 173). The system expands as long as profits can be made, which drives producers to be more innovative and expand profit margins (ibid.). As individuals or groups compete to gain advantages over others primarily by amassing capital for the sake of greater profit, macro cleavages and inequalities arise. A three-tiered capitalist world-economy arises, composed of the core, semi-periphery, and periphery. This structure is characterized by dependence, and by unequal and exploitative relations. For Wallerstein, it first emerged in northwestern Europe in the 16th century. According to him, northwest Europe was in a better position than other parts of the continent to diversify its agricultural economy to include industries like textiles, shipbuilding, and metal wares (Wallerstein [1974] 2011, 400). These necessitated tenancy and wage-labor, in sharp contrast to Eastern Europe and the Western Hemisphere, which in turn became peripheral areas specializing in the export of raw materials and slave labor ([1974] 2011, 401). Other historical examples include Latin America, where the “development of underdevelopment” has been and continues to be exacerbated by the appropriation of capital and surplus by colonial metropolises from their former satellites, or colonial possessions (Frank 1966, 20).

While debates continue about the age of the world system, or whether a single world system has been in existence for about 5,000 years (Frank and Gills 2000; Gills and Frank 1996; Modelski 2000), there is consensus between the “five-thousand-year” camp and the *dependencia* school about zones of inequality and exploitation in the capitalist world-economy. The modern capitalist world-economy is predicated on the appropriation and accumulation of surpluses from poor regions, or the periphery, to the relatively more developed semi-periphery and advanced, industrialized core (Benczes 2014, 137). Areas in the core are sites of global economic control and

wealth, and attendant political and military power and influence, while also featuring high-skilled, capital-intensive production (Klak 2014, 123). The periphery is the backwater of the world-system, characterized by poor living conditions and bleak development prospects, and marked by the provision of low-skilled labor and raw materials to more advanced zones of the global economy (ibid.). The semi-periphery combines elements of both (Peet and Hardwick 2009, 174). The semi-periphery is in between the core and periphery in regards to the complexity of economic activities, strength of the state, and cultural integrity (Wallerstein [1974] 2011, 349). Moreover, these semi-peripheral areas were either once part of the core in earlier versions of the world-economy, or parts of the periphery that were promoted as a result of expansion (ibid.). Strategically, they are vital to the workings of the world-system. These so-called middle areas, as Wallerstein articulates, partially deflect political pressures that actors in the periphery might otherwise exert on the core ([1974] 2011, 350) to disrupt or even shake up the hierarchy of the world-economy.

Movements of areas or regions across zones gives an indication that the world-system is not static. The identities comprising the core, semi-periphery, and periphery change. It is the hierarchical structure that has remained constant in world-systems. Scholars such as Frank and Gills attribute these movements to cyclical characteristics like expansion and contraction, which emanate from the core (Frank and Gills 2000, 12). They emphasize that:

[J]ust as the world economy/system never entirely ‘falls’ but only changes, hegemonic ascent and descent are usually quite gradual and do not occur in a unipolar framework, but rather in a multipolar one... Indeed, it is integral to our structural theory of world development that areas once peripheral may ascend to hegemonic or core status, while areas once in the core may descend into the periphery. We particularly emphasize how economic rhythms common to the entire world system,

such as long cycles of expansion and contraction, affect the relative position of all of the 'parts' of the system (2000, 10).

Longue durée changes³ have given rise to challengers to the United States' position at the core such as Japan or the East Asian newly industrialized countries (ibid.). World-systems scholars trace rhythmic contractions and expansions, and the attendant rise and fall of dominant powers or hegemons, from a wide range of time periods. Wallersteinians go back to the 16th century. Writers like Abu-Lughod (1989) explore the *longue durée* from the 13th century. Much of the content in Frank and Gills' co-edited volume (1996) represent views on systemic changes spanning 5,000 years.

3.3.2 Linking World Systems, Cities and Commodity Chains

Traditionally, there have been two ways to undertake studies on cities and commodity chains. The first approach is practiced mostly by world-systems analysts studying commodity chains as outcomes of advanced producer services, which have come to dominate the command and control hubs known as world cities (Amen et al. 2012; Friedmann 1986; Friedmann and Wolff 1982; Sassen 1991, 2002, 2012; Parnreiter 2012; Smith 2012; Taylor 2004, 2005, 2007; Taylor, Ni and Derudder 2011; Timberlake 1985; Timberlake and Smith 2012). The primary foci in these works are the cities. Commodity chains and/or commodity distribution are viewed as one of the many processes brought about by the structural division of labor between cities in the world-system. An alternative approach is how particular commodity chains enable cities or city-regions to perform specific functions as nodes in the world-city network. Examples of this are Parnreiter's analysis of the connections between Mexico City's producer service sector and firms facilitating commodity chains through the city

(2010, 45), as well as Chen's (1994) study of the diversity in the division of labor in the Greater South China Region.

The second approach focuses on particular commodity chains, and follows their development across time and/or space. Cities and regions are treated as sites where commodities "travel" to take their form, shape, and ultimately, value. Scholars from both the Global Commodity Chains [GCC] and Global Value Chains [GVC] camps often resort to this approach, although world-systems analysts likewise employ this especially when historicizing a commodity or probing issues related to its surplus value. GCC and GVC researchers utilize this approach as they take a strong interest in supply chain management, the governance of commodity chains, and how value is added to commodities from raw materials to finished products. Topik (2009), for example, historicizes the global coffee commodity chain the past 500 years, while Pelizzon (1994) analyzes the grain flour commodity chain from 1590-1790. Gibbon (2001) combines the two approaches in his piece. But, his case study on the upgrading and downgrading of "traditional" primary commodities in Tanzania – cotton and table fish – between 1984 and 1999 is noteworthy for its application of macro concepts to particular historical instances (2001, 354-59).

Such examples reference the longitudinal developments of particular consumer products. However, even entire industries have been examined from this commodity chain-focused approach. Özveren (1994)'s piece on the shipbuilding commodity chain is a case in point. Stringer (2006) scrutinizes the forest certification processes in Australia, Indonesia, Malaysia, and New Zealand to elucidate the nexus between the continued supply of wood and growing corporate preference for certified timber (2006, 715). This relationship reinforces the role of certification in maintaining

commodity chains while acknowledging the changing nature of commodities in these chains.

3.4 The Product Life-cycle Theory

Pioneered by economist Raymond Vernon (1966), the product life-cycle theory, or product cycle theory, posits that a product's geographical origin is linked with its life-cycle. Innovation, he implies, is associated with decisions entrepreneurs and firms make about where a product is made. Vernon states that a product goes through five phases: initial development, growth, maturity, decline, and obsolescence. Each of these is inseparable from a locational logic. Each phase likewise has an effect on a particular country or region's status as a net exporter and importer.

In a product's initial development phase, entrepreneurs and firms in the United States⁴ are confronted with 1) a sense of opportunity to develop a product in a familiar location due to ease of communication (Vernon 1966, 192); and 2) the expectation of a higher rate of expenditure than competitors in other countries on product development to substitute capital for labor and satisfy high-income wants (1966, 193). Resultantly, American entrepreneurs would most likely choose familiarity with domestic markets and opportunities for more efficient communication with customers, suppliers, and even competitors (1966, 195) over lower labor costs, which are available overseas. Furthermore, it is important to note that in this phase, the product in question is highly unstandardized, with a wider range of inputs and greater degree of freedom for experimentation (ibid.). Hence, Vernon concludes that nascent product development begins in advanced industrialized countries.

In the growth phase, products become less flexible, and more specialized and standardized as a response to increased demand. The achievement of economies of

scale and desire to reduce production costs prompts firms to shift locations, at least domestically⁵. Eventually and presumably in the maturity phase, American companies would look to relocate local production units to other advanced countries that have lower production costs and in order to respond to limited but growing demands for the product internationally (1966, 196-98).

Moving production units to locations where labor is cheaper alters patterns of imports and exports (Knox, Agnew and McCarthy 2014, 83). Here, Vernon makes his most important argument. The introduction of a new product in the United States is followed by U.S. exports, However, businesses and firms in importing countries grow restive over the entry of U.S. exports, which in turn prompts them to think of ways and means to replace American imports with their own products (Vernon 1966, 200-201). Businesses in less developed regions and areas thus begin to export to the U.S. in the maturity phase (Knox, Agnew and McCarthy 2014, 83). Less innovations as a consequence of mass standardization, though, lead to declining demand in the good in question (Dicken 2011, 98). Investments in firms in underdeveloped regions is less attractive due to high or, at times, erratic interest rates (Vernon 1966, 206). These factors ultimately lead to the decline and obsolescence of the product.

The product life-cycle theory has implications on which goods end up where in the distribution side of the global commodity chain. If the technology of a smartphone, for example, is learned by South Korean firms from their American counterparts, and proves to be popular in South Korea, Korean importers would be less inclined to import American smartphones than they would had the South Korean version flopped in its own market. The same premise could be applied to other products transported by air. Depending on a host of variables such as a good's origin of final assembly or

production, market preferences, or where firms choose to invest. Cities can either benefit or suffer from the development, maturation, and obsolescence of a product. If its loci of production shifts, the city receiving that shift benefits. If that locus moves away, the city could suffer – a phenomenon seen in the later discussion on Detroit. Whatever the outcome is, the product life-cycle theory frames any discussion on the distribution side of commodities.

The product life-cycle theory also has geographical consequences in a post-Fordist economic system. Amin and Malmberg cite a group of scholars, most notably Piore, Sabel, and Storper, who claim that the irreversible growth brought about by post-Fordism's key features – consumer sovereignty, market volatility, and shortened life-cycles for products – necessitates a more flexible organization of production (1994, 229). Because of flexible production processes, commodities are assembled in various parts of the world. For these commodities to be completed, they must be sent to a firm's primary assembly plant or a designated site where the final product is assembled. Depending on their points of origin, component parts may be transported via rail, sea, or air. One of the main commodities comprising air freight is capital equipment, which is crucial to many different commodity chains such as automobiles, laptops, and mobile phones.

3.5 Conclusion

Linking air freight, urban growth, and the role of airports under the theoretical frame of world-systems analysis and the product life-cycle theory is undeniably a challenging task. This chapter has attempted to synthesize these seemingly different frameworks to arrive at a more solid foundation and support a novel scholarly undertaking like this.

ENDNOTES

1 While Conway did not account for suburbanization and the “displacement” of the airport from the confines of the city center, his insights on multimodal transportation, land use, and “boxed in” airports – enveloped by different kinds of activity – implicate cities and their relationship with airports serving them.

2 Two tiers, for dependency school theorists (see, among others, Cardoso and Faletto 1979)

3 Economic cycles in world-systems thought are known as Kondratieff waves, which fit into larger and longer-term cycles. Kondratieff A phases are characterized by economic booms, or hegemonic ascents, while B phases are periods of decline. A and B phases alternate for periods of about 60 years. Frank and Gills’ (1996) and Denemark et al.’s (2000) edited volumes present an array of articles that discuss Kondratieff waves in a more in-depth manner.

4 Throughout his piece, Vernon uses American businesses, firms, and entrepreneurs as his points of reference. In other words, all the decisions and courses of action pursued by actors are pursued by American actors.

5 Vernon (1966, 196) is wary of asserting that firms would begin transferring production to international locations, but does not rule it out even in these early phases.

Chapter 4

METHODOLOGY

4.1 Analytical Framework

This dissertation aims to explore the relationship between air cargo throughput, measured in metric tons, and the demographic, economic, and geographical growth of cities. It relies on world-systems analysis for a theoretical framework. Broadly construed¹, world system history (Denemark 1999; 2010), or world-systems analysis (Chase-Dunn and Grimes 1995), is a transdisciplinary undertaking oriented towards understanding a whole system, characterized by Wallerstein as a “geographic entity with a single division of labor” (Peet and Hardwick 2009, 173). It is marked by capital accumulation from infrastructural investment in agriculture, industry, transport, commerce, and military (Frank and Gills 1993b, 7), through an *interaction* of what we see as its units (Denemark 1999, 51; emphasis original).

The modern world-system is viewed as a complex set of nested and overlapping networks of these units connecting all units of social analysis: individuals, households, neighborhoods, firms, towns and cities, classes and regions, nation-states and societies, transnational actors, international regions, and global structures (Chase-Dunn and Grimes 1995, 388-89). So, at a country-level, for example, “development conditions and prospects are primarily shaped by economic processes, *commodities chains*, divisions of labour, and geopolitical relationships operating at the global scale” (Klak 2014, 121; emphasis mine). Cities are likewise embedded in relationships with

other units in the world-system, and consequently experience growth and development, or the lack thereof, under the same structural conditions.

A hallmark of the current world-system is a power hierarchy between a core and its periphery (Frank and Gills 1993b, 3-4). Defining the world in terms of core areas, or the wealthy and developed regions of North America, Western Europe, and Pacific Asia, and peripheral areas, meaning underdeveloped lands comprising the ‘Third World,’ is commonplace (Flint and Taylor 2011, 20). Features of core regions include relatively high wages, advanced technology, and a diversified production mix (Knox, Agnew and McCarthy 2014, 21). Peripheral areas are characterized by low wages, more rudimentary technology, and a simple production mix (ibid.). In between these two zones is a semi-periphery, which shares some characteristics of both the core and the periphery (Wallerstein 2011 (1974), 349). This “extensive division of labor” is based on geography and an uneven distribution of economic tasks, which rewards capital accumulation and higher levels of skill over raw labor power (Wallerstein 2011 (1974), 350). Of note is the consensus among world-systems scholars that the composition of these zones is not static. Areas can move from the semi-periphery to the core, or the periphery to the semi-periphery, and so on.

I hypothesize that increased air cargo throughput leads to the demographic, economic, and geographical growth of cities. Air freight, a proxy measure for global trade, is hypothesized to contribute to urban growth and is the independent variable. Urban growth is a comprehensive conceptualization with three facets: demographic, economic, and geographical growth. Therefore, there are three ways to measure the dependent variable, and all three share a single conceptual rubric: urban growth and development. The hypothesis loosely reflects a world-systems approach insofar as

ceaseless capital accumulation, both the objective and result of global trade, results in the rise of cities to core status.

4.2 Operationalization

Conceptually, the use of proxy measures is an important part of the dissertation. As stated above, air cargo throughput, the loading and unloading of goods in an airport, is a proxy for global trade as well as commodity chain distribution. Logistics and the movement of goods by air is a vital medium for the distribution of commodities.

Similarly, airports in this piece are proxies for the cities they serve. Major airports serve cities with high volumes of passenger traffic or freight, or a strong demand for both. Some cities, like London, Paris, New York, and Moscow, are served by more than one airport. To alleviate this problem, I borrow Grubestic and Matisziw's (2012) method while studying air passenger flows and world city networks. There are, according to them, two ways to address the issue: aggregation and disaggregation (Grubestic and Matisziw 2012, 103). Take New York City as an example. Aggregation is assigning, say, Newark Liberty International Airport [EWR] – located in New Jersey and a gateway to urban areas in the state and some parts of Pennsylvania – to New York City, along with LaGuardia Airport [LGA] and John F. Kennedy International Airport [JFK]. For them, aggregation poses a problem because untangling the destinations of passengers or cargo potentially becomes difficult. Newark itself is a city that could plausibly be studied under a world city rubric – it is New Jersey's largest city. In the context of air freight, logistics services designate particular service areas to commodities arriving in an airport. Newark is out-of-state,

and realistically serves as a logistics gateway to New Jersey and some parts of Pennsylvania, not just New York City.

While this line of reasoning is more than plausible, another measure used by Grubestic and Matisziw is the distance between an airport and the city center it caters to. Although they acknowledge that setting a marker is somewhat arbitrary, it is crucial, especially when parsing out whether or not an airport actually serves a given city. Even when adopting disaggregation, which is another method the two scholars utilize, distance between an airport and city center² comes into play. Grubestic and Matisziw use 70 miles as a marker, reasoning that it is approximately an hour's drive by car.

This piece uses this logic, EWR would be part of New York City and not Newark, and JFK and LGA would be integrated into New York City. Similarly, Frankfurt-Hahn Airport [HHN], despite carrying the name of Frankfurt, is approximately 78 miles from Frankfurt. Hence, it stands alone, serving the town of Hahn and is not integrated into Frankfurt, which in turn only has one airport – Frankfurt Airport [FRA] – in this study.

Another caveat is that airports within 70 miles of a city in a different country are not integrated into that foreign city. Frankfurt-Hahn Airport is almost 70 miles from Luxembourg. But, since it is not part of Luxembourg, it does not constitute the concept of Luxembourg's airport-city. This is because many of the other independent variables that will be controlled for are national-level variables. Frankfurt-Hahn Airport's data would be part of Germany, not Luxembourg.

The sample of cities studied comes from data on the 150 busiest airports in the world by cargo throughput from 1995³ and 2014⁴. This timeframe encompasses two

decades, or roughly one generation, and is a plausible period for measuring urban economic, demographic, and geographic decline. Since the rankings are by airport, and given the fact that multiple airports serve a single city, the list to be used in this study would not be a carbon copy of the 2014 list. Instead, every airport beginning from the busiest [top-ranked] was examined. If the airport is part of a city that has yet to be included in the study's list, it is put in the sample of cities. If the airport is determined to be part of a city already on the study's list: 1) its total air cargo throughput is added to the city it is included in; and 2) the next airport in the list is analyzed. The process ends with the 150th city⁵. The final list of cities, then, constitutes 150 airport cities. It is another conceptualization of an airport city: an amalgamation of proximate airports that serves a city.

A few cases involve airports serving major cities within 70 miles of each other. Such cases include Washington, D.C. and Baltimore, Cologne and Dusseldorf, and Guangzhou and Shenzhen. In these cases, the city with the larger population was chosen to be the airport city, and the other city was incorporated into it. Population remains one of the most accurate and efficient measures of city-level data, and hence it was chosen to be the criterion to determine such cases.

Air cargo throughput, the independent variable, is operationalized as loaded and unloaded commodities in airports, and measured in metric tons. It is an interval-level measure. Urban growth/decline of airport cities, operationalized through demographic, economic, and geographical change, is the dependent variable. Airport cities may be an amalgamation of several airports within 70 miles of a city center, or a city with a single airport. Economic growth or decline is measured by changes in 1) GDP per capita growth between 2000-2014⁶; or 2) employment rates between 2000-

2014⁷. Demographic change is measured by the rate of change in a city's population between 2000 and 2015⁸. Geographic change is measured as the percent change in cities' green area per one million people from 1995-2014⁹.

4.3 Case Selection

The 150 busiest airport cities by cargo data from 1995 and 2014 include a total of 219 airports. Since 2014 is the endpoint for the growth or decline of air freight in airports, it is the chronological basis for the list. Appendix A contains the list of 150 airport cities.

The first of two methods used in the dissertation is the Most Different Systems Design [MDSD], which takes as a starting point the “variation of the observed behavior...[at] the level of groups, local communities, social classes, or occupations,” under the assumption that the cases under investigation were taken from the same population (Przeworski and Teune 1970, 34-5). In other words, the units being compared have very few – if any – characteristics in common other than the outcome under investigation.

MDSD is used to compare the cities of Detroit and Doha. The only prominent similarity between both cities is that they started out as single-resource or industry economies: Detroit was America's automobile capital, while Doha was driven almost exclusively by pearl-hunting before the discovery of petroleum in the late 1930s. Other than that, differences abound. Geographically, Detroit was always a large conurbation surrounded by lakes, while Doha is in the heart of a desert. Demographically, Detroit's population far outnumbered Doha's. Detroit's working class was predominantly American, while Doha's was a product of open, cross-border migration. But, at their economic peak, both cities accounted for a substantial portion

of each countries' economic output. Why did their urban outcomes converge despite these differences? MDSD is a tool to help answer this question.

Regression analysis is the second method I utilize for this project. The increase or decrease in the 150 cities' air cargo throughput values from 1995 to 2014 is the independent variable. I control for the following: change in cities' absolute global network connectivity scores from 2000 to 2012¹⁰, expressed as interval-level values; percentage changes in national GDP per capita levels from 2000 to 2014¹¹; and differentials in national level unemployment rates between 2000 and 2014¹². Also controlled for were Polity IV scores for 2015 to determine if the country the city belongs to is a liberal democracy or not [expressed as a binary variable]¹³¹⁴; and the change in total passengers between 1995 and 2014, with passengers in transit counted once¹⁵, as an interval-level variable. Other control variables are whether the city has a new airport¹⁶ built during the timeframe that city's data covers, and port cargo throughput, measured in Twenty Foot Equivalent Units [TEU], as of 2014¹⁷.

My hypotheses stand if, holding all variables constant, air cargo throughput results in demographic, economic, and geographic growth. Below are the regression equations operationalizing these hypotheses.

$$DC = ACT + GCN + GDPC + UNE + PIV + PAF + NAT + PCO$$

$$EC_1 = ACT + GCN + GDPC + UNE + PIV + PAF + NAT + PCO$$

$$EC_2 = ACT + GCN + GDPC + UNE + PIV + PAF + NAT + PCO$$

$$GC = ACT + GCN + GDPC + UNE + PIV + PAF + NAT + PCO$$

Where DC is demographic change; EC₁ is economic change [GDP per capita, city-level]; EC₂ is economic change [city-level employment]; GC is geographic change; ACT is air cargo throughput; GCN is global connectivity scores; GDPC is GDP per capita, national-level; UNE is unemployment rate, national-level; PIV is Polity IV scores; PAF is passenger air flows; NAT is new airport or terminal built; PCO is port cargo throughput.

The dependent variables are operationalized as follows:

DC: The difference in a city's population between 2001 and 2015.

EC₁: Change in a city's GDP growth rate from 2000-2014, expressed in percentage.

EC₂: Change in a city's employment rate from 2000-2014, expressed in percentage.

GC: Change in cities' green area, expressed in sq. m² per 1M people from 2000-2014, expressed in percentage.

Table 4.1 summarizes the independent variables, how they are operationalized, and the expected relationship with demographic, economic, and geographic changes.

4.4 Control Variables

As Table 4.1 states, there are seven additional independent variables accompanying air freight in the multiple linear regression model. These are controlled for to isolate the possible effects of air freight on two dimensions of economic,

demographic, and geographic growth. The logic of including these variables in the statistical model is discussed here.

Global connectivity network scores (GCN): As discussed throughout this piece, the literature on world cities and world-city networks is burgeoning. Taylor, et al., (2011) were among the scholars who specified the types of linkages cities had with one another. They created a connectivity score that included the size and number of advanced producer service firms headquartered in cities. Global connectivity scores, which can range from zero to infinity are derived from the presence of accounting, advertising, financial services, law, and management consultancy firms in cities.

National GDP per capita (GDPC)/National unemployment rate (UNE): The state-centric approach to International Relations has always emphasized national-level variables. Conclusions derived from this level have been applied to “sub-national” phenomena. If a state is wealthy, then its capital city most likely will be wealthy, too. If a state has a low unemployment rate, then its primary population centers must also be employment hubs. This piece attempts to control for national-level variables in order to ascertain if city-level data impact urban growth.

New airport (NA): Cities spend billions of dollars on building aesthetically and structurally stunning commercial airports and massive cargo facilities. What is the rationale for this? Building new airports generates job opportunities, as was the case when Doha, Qatar undertook the development of the Hamad International Airport with mostly foreign labor. One of the rationales behind the building of the Kuala Lumpur International Airport, which replaced Subang Airport in 1998, was to bolster Malaysia’s primary economic center and fulfill former leader Mahathir Mohamad’s Wawasan [Vision] 2020. The primary goal of Wawasan 2020 is to establish Kuala

Lumpur and Malaysia's position as a developed and economically advanced entity (Marshall 2003, 171). If new airports are determinants of urban growth, they must be tested empirically.

Passenger air flows (PAF): If an argument is to be made about the positive correlation between air freight and urban growth, an alternative yet plausible hypothesis could be formed about the passenger air flows as a predictor of urban growth. Air cargo may spawn urban growth inasmuch as human beings who cross borders as tourists or workers.

Polity score (PIV): Centralized decision-making, which most often could be found in autocratic polities, has been discredited particularly after the implosion of the Soviet Union and Iron Curtain. Liberal democratic triumphalists have sung the opposite tune: more open and transparent decision-making processes lead to multi-faceted growth. Do these logics apply to cities and urban growth?

Port cargo throughput (PCO): Air cargo is not the sole means of transporting goods across the world. Slower cargo ships capable of carrying heavier commodities would make a logical hypothesis for causing urban growth, particularly in entrepôt cities and vital trade nodes in the capitalist world-economy. As such, it has to be controlled if the effects of air freight on urban growth are to be illustrated.

4.5 Anticipated Results

It is important to stress that, despite my hypotheses, the research question I pose is open-ended. I do not have a predetermined result in mind, despite related literature suggesting that increased air cargo throughput leads to growth and development. If my central hypothesis is confirmed, it would 1) strengthen the world-systems framework and attendant arguments about the trade-capitalist world-economy

nexus and core-periphery relations, especially when the data on transnational retailers and their areas of origin are factored in; and 2) advance a novel argument about determinants of a multifaceted conceptualization of urban growth.

If at least one of my hypotheses were debunked, it would raise questions related to the wisdom of constructing mega-billion infrastructure projects such as airports, as well as problematizing the notion that they are gateways to sprawling cities littered with large capitalist firms. What is the underlying logic driving both public officials and private consortiums to embark on erecting cutting edge cargo terminals if they do not necessarily result in the growth of the cities they serve? Likewise, it would spark further inquiry into the distribution side of commodity chains, arguably the least studied part of global value chain research (Dicken 2011, 399-400).

ENDNOTES

1 For a more in-depth look at various conceptualizations of world-systems [both in hyphenated and two separate word forms], and the debates surrounding them, see Frank and Gills 1993a.

2 Distance between an airport and city center is measured using Google Maps

3 2001 data from Airports Council International listing (2002)

4 Data from ACI's 2013 press release (2014); for cities in the 2001 list no longer in 2013, and vice-versa, data from the airports themselves will be used.

5 Data for the 150th airport city and the only airport serving Rockford, IL, were unavailable until 2009; the base year of 2014 would then be at most only four years earlier. Therefore, the 151st city, Tampa, FL, was elevated to no. 150. This was the only case of data unavailability of this nature in the sample.

6 Indicators from Brookings Institution's Global Metro Monitor Map (2014)

7 Ibid.

8 Where applicable; some city-level data lack census or estimates for the years 2000 and 2015. Hence, the closest timeframes to these years were chosen; Population estimates from various sources.

9 Data from the OECD's metropolitan areas section (2015b), as well as individual sources for cities not in the dataset.

10 Global network connectivity scores are found in GaWC (2015) and Taylor 2016

11 Data from UN Statistical Division (2015)

12 Data from World Bank (2015)

13 Polity IV data from Center for Systemic Peace (2015)

14 Polity IV country scores range from -10 to 10, with -10 being a hereditary monarchy and 10 indicating a consolidated democracy. Three sub-groups within this range likewise exist. For the purposes of this study, cities in countries with scores from -10 to 0 were classified as autocracies/anocracies, and democracies for scores ranging from 1 to 10.

15 Data from ACI 2002b and 2014

16 A new airport is operationalized as: 1) the completion of a completely new airport that replaces an old and existing one for commercial use; 2) the erection of a new terminal to augment commercial operations of a commercial airport and its existing terminals. These criteria can be seen as applicable to “from-the-ground-up” structures. The second criterion does not cover upgrades or improvements made to already existing terminals.

17 Data from AAPA (2016). If 2014 data are unavailable, the closest year with available data are selected, also from the same data source.

Table 4.1: Independent Variables and Expectations

Independent variable	Operationalization	Expected relationship with demographic change	Expected relationship with economic change [E ₂]	Expected relationship with economic change [E ₃]	Expected relationship with geographic change
Air cargo throughput	Difference in loaded and unloaded freight in airports between 1995 and 2014 [in %]	Positive	Positive	Positive	Positive
Global connectivity scores	Gross connectivity scores between in 2008	Positive	Positive	Positive	Positive
National GDP per capita	National-level GDP per capita growth rates between 2000-14	Negative	Positive	Positive	Positive
National unemployment rate	National-level unemployment rates between 2000-14	Negative	Negative	Negative	Undetermined
New airport	Building of a “from-the-ground-up” airport or terminal	Positive	Positive	Positive	Undetermined
Passenger air flows	Difference in passengers embarking/disembarking between 1995-2014	Undetermined	Positive	Positive	Undetermined
Polity score	Dummy variable: 1 = autocracy; 0 = liberal democracy	Undetermined	Positive	Positive	Undetermined
Port cargo throughput	Total loaded and unloaded container traffic in TEU, 2014	Positive	Positive	Positive	Undetermined

Chapter 5

A TALE OF TWO CITIES: COMPARING DETROIT AND DOHA

Detroit and Doha are two cities that hog headlines for different, even opposite reasons. On the one hand, Detroit, once the epicenter of America's Rust Belt and industrial heartland, filed for bankruptcy in the face of a harsh socio-political and economic winter in 2013. On the other hand, Doha has become emblematic of the urban success stories in the Middle East. This chapter explores the history, theories, and explanations of urban demise or upsurge of Detroit and Doha, respectively. Its objective is to demonstrate some of the key descriptors of a city's rise and fall. In other words, this section attempts to show what urban demise and growth look like from a long-term or *longue durée* perspective. The last subsection of the chapter probes how these descriptors are related to one another to comprise a multifaceted characterization of urban growth and decline.

5.1 Detroit: The Best of Times, the Worst of Times

On July 18, 2013, the city of Detroit became the United States' largest city ever to file for bankruptcy (as Monica Davey and Mary Williams Walsh state in a *New York Times* story on July 18, 2013). With an estimated debt of \$18.5 billion, Detroit epitomized the antithesis of the competitive global city, dotted with empty factories and decrepit buildings instead of the bustling headquarters of advanced producer services that have come to define New York or Los Angeles. Unlike cities that previously filed for bankruptcy, like Stockton, California, Detroit was once an

economic powerhouse, a magnet for jobs, and the home of industrial activity. Manufacturing is central to understanding how a mighty economic juggernaut was brought to its knees in a span of only three decades.

5.1.1 America's Economic Engine

Originally not the geographic center of the American automobile industry, Detroit began to attract automotive firms when the industry became an oligopoly after the domination of the so-called Big Three in the early 1900s: General Motors, Ford, and Chrysler (Klepper 2001, 4). In 1901, only one firm – Olds Motor Works – was based in the city; by 1913, they numbered 41 (Klepper 2007, 618). The percentage of auto firms in the Detroit area rose to 15 percent by 1905, and to an all-time high of over 50 percent by 1935 (Klepper 2001, 5). Consequently, Detroit in the early 20th century was a total industrial landscape, with factories, shops, and neighborhoods enmeshed in a complex grid of streets and train lines (Sugrue 1996, 18). Interestingly, around 40 percent of the city's industrial jobs were in non-automotive sectors such as stove making, brewing, and furniture building, all alongside the factory of the world's largest pharmaceutical corporation at that time (ibid.). Detroit's economy, while centered on the automobile industry, was diversified, reflecting its industrial reach and urban vibrancy.

Detroit's economic prowess was enhanced during the Second World War. Here, Detroit became America's "Arsenal of Democracy," playing an integral role in the United States' war effort. Detroit's automobile manufacturers turned into producers of military hardware, airplanes, tanks, and other vehicles (Sugrue 1996, 19). Once one of the nation's most depressed urban areas, Detroit had become a magnet for workers all over the U.S., with labor drawn from rural Appalachia, central Michigan,

Ohio, Indiana, and the deep South (ibid.). Its population increased sixfold from 1900 to 1950, in large part due to the influx of migrant workers (Boyle 2001, 109).

The 1940s and 1950s were decades of economic and financial prosperity for the city and its inhabitants. Detroit's biggest labor union, the United Automobile Workers, ensured generous contracts from automobile manufacturers (Boyle 2001, 110). Working-class Detroiters began reaping the fruits of a flourishing middle-class lifestyle: brand-new cars on driveways, new appliances in kitchens, and the realistic prospect of a vacation (ibid.). Some scholars, such as Boyle and Chafets (1990), claim that the shift from a prosperous white city to a poor and black urban area happened quickly. However, several historical instances point to a more gradual buildup that peaked with the violent riots of 1967.

5.1.2 Suburbanization and Decline

The so-called post-industrial period saw the expansion of Detroit beyond its city limits and into the counties of Macomb, Oakland, and Wayne (Booza and Metzger [2004] 2006, 46), catalyzing suburban flight and decentralization of the city center in the process. Decentralization was supported by the subsidization of highway construction and home buyers, all of which attracted businesses and better-off individuals to the suburbs (Tabb 2015, 2). The Federal Highway Act of 1956 created a fund that subsidized 90 percent of national highway construction costs to build a network to facilitate the movement of goods and people (Booza and Metzger [2004] 2006, 46), although its mass transit and commuter rail systems have been described as inadequate (Savitch and Kantor 2002, 128). Likewise, the federal government indirectly supported "white flight" from the city as government and private home loans were limited to racially homogenous areas, thus excluding central Detroit and

also creating incentives to buy homes outside the city (ibid.; Eisinger 2014, 4). In the city itself, urban renewal through land clearance eliminated more low-cost housing units than it replaced, resulting in displacement and intensified racial segregation. (Savitch and Kantor 2002, 128). Between 1960 and 1967, about 26,000 homes were demolished as a result of highway construction, while only 15,000 units were built to replace them (Savitch and Kantor 2002, 128-29). These factors led locals to move away from the city center towards its surrounding neighborhoods and outer rings.

The decline of central city Detroit, however, was not merely caused by structural reasons. Cultural outlooks in the city, according to Savitch and Kantor, “are driven by a tradition of trade unions, racial issues, and desperation for private capital” (2002, 84). Conflicts between labor and management often divided the mostly single-industry and union-driven city, contributing to an atmosphere of distrust and racial tensions (ibid.). Making matters worse was the fact that too little citizen consultation took place (Savitch and Kantor 2002, 129). In an attempt to address the brewing crisis, the federal government in the 1960s, anchored on a liberal-labor coalition, pushed for greater revenue-sharing under the assumption that businesses would return sooner rather than later.

Racial issues reached a boiling point in 1967 when intense rioting – some of the worst the nation had seen – required the intervention of 800 state policemen and an initial 1,200 National Guardsmen, with an additional 8,000 on the way (National Advisory Commission on Civil Disorders 1968, 53). Alongside rising crime, the violence of 1967 accelerated white exodus and fostered a dim view among locals of public authority and professional urban planning (Savitch and Kantor 2002, 84).

The events of 1967 capped an already troubling run-up to urban instability. Historians, according to Boyle, agree that, beginning in the late 1940s, Detroit was deprived of a political vision, torn by racial conflict, and hit by the global shift towards deindustrialization (2001, 110). The years that followed saw these problems intensify, further protracting Detroit's condition well into the 21st century.

5.1.3 From 1967 to the 21st Century

In a ground-breaking study and comparison of 10 cities, Savitch and Kantor articulate a theory of urban development centered on the idea of city bargaining, or “the ability of a city to garner resources in order to maximize its choices and ultimately realize its objectives in the capital investment process” (2003, 43). Five of the cities analyzed are what could be called world cities, while the other five, including Detroit, are better described as distressed. An important part of their theory development involved delving into history, as well as policies decision-makers arrived at in attempts to develop their cities.

On the heels of a seven-year stretch from 1960-67 that saw the demolition of 26,000 homes and the creation of only 15,000 (Savitch and Kantor 2003, 128-29), Detroit's leaders, most prominently Mayor Coleman Young, embarked on a business-friendly strategy that complemented federal support for the next 30 years (Savitch and Kantor 2003, 129). Young pursued two notable projects in the hope of resuscitating the economy: A Central Industrial Park to house a General Motors plant, and a 637-acre space to host Chrysler (Savitch and Kantor 2003, 130). While city officials contended that the two new automobile plants restored Detroit's status as the country's car capital, they did not bring about the expected economic and social gains. This status symbol, however, cost the city. The city's decline could in large in part be

traced to its dependence on the automobile industry (Eisinger 2014, 4). Quoting Galster, Eisinger says the city's Faustian bargain involved the embrace of one industry at the expense of almost everything else, de-skilling local workers by way of its monotonous assembly line, and leaving them unprepared to compete with other skilled laborers in alternative industries (ibid.).

Even the construction and subsequent renovations of Detroit's current international airport, Detroit Metropolitan Wayne County Airport [also known as Detroit Metro Airport], required the demolition of homes in the airport's perimeter zone (Gallagher 2014, 42). Gallagher contends that the idea of consuming "spatial products," including the Detroit Metro Airport, was pitched mostly since 1975 when the notion of shared urban space had been "shredded" (2014, 43). Problematically, the idea was pitched to the remaining residents of the city who understood space to be common, and shared with neighbors and neighborhoods (ibid.).

Detroit's downward spiral continued well into the 21st century, reaching an unprecedented low after its officials filed for bankruptcy in 2013. Among the many indicators of Detroit's decline and purported "death" (Eisinger 2014; LeDuff 2013; Marchand and Meffre 2010) is population loss. What was once home to two million people is now a city of between 700,000-713,000 (Binelli 2012, 9; As Monica Davey and Mary Williams Walsh state in a *New York Times* story on July 18, 2013). Between 1959-1990, Detroit lost 44% of its population, and its increasingly isolated non-white population in 1990 was 77% (Pacione 2009, 322). The divide between the city center and surrounding suburbs that began in the 1960s has carried over into Detroit's contemporary identity. Detroit's city-to-suburb income ratio in 1990 was 53%, signaling the extent of the decline in city residents' purchasing power (ibid.). The

larger, census-designated area of Detroit-Warren-Livonia was the most decentralized metropolitan area by employment size in the country, with almost 78% of all jobs beyond 10 miles of its urban core or CBD, Detroit, in 2010 (Kneebone 2013, 9). The area also ranked ninth in the United States in share of employment in high-density zip codes outside the urban core at nearly 50%. (ibid.). In the first decade of the 21st century, a total of 475,591 jobs within 35 miles of Detroit were lost (Kneebone 2013, 18), the highest number among the country's largest 100 metro areas.

Detroit's city and county officials have looked at the Detroit Metro Airport as a potential stimulus for economic development. The opening of the new McNamara Terminal, then known as Northwest WorldGateway for the now-defunct international airline that made the Metro Airport its hub, in 2002 sparked hopes of a wave of economic growth through logistics and global trade (as Tom Walsh states in a *Detroit Free Press* story on May 10, 2015). The cornerstone of the aerotropolis was supposed to be 486-hectare Pinnacle Aeropark, with a planned direct link to Detroit's international airport. Part of the plan included a 34-hectare commercial cluster at the heart of a 200-hectare flex-tech facility for plastics and metalworking; a 44-hectare logistics hub; 27 hectares in office development; and 175 hectares worth of rights-of-way and open space (Appold and Kasarda 2011, 98). Included in the proposed commercial cluster were three business class hotels and a conference center (ibid.).

An initial consortium of two developers was chosen in the mid-2000 to break ground, but the parties failed to reach a working agreement (ibid.). To date, the project has yet to break ground. For one journalist, "poor leadership, political scandal and dysfunction, a nasty recession and a bad bet on horse racing [in reference to Pinnacle's implication in the construction of a horse racing track that shut down only a few years

after opening]” (as Tom Walsh states in a *Detroit Free Press* story on May 10, 2015). VantagePort, the rebranded name of the aerotropolis project, remains steadfast in its belief that the project could still come to fruition. Citing data on Detroit’s importance as a passenger and logistics center, and Delta Airlines’ commitment to use the Metro Airport as a hub, officials believe that the promise of attracting \$10 billion worth of investment and 64,000 jobs could still become a reality.

5.2 Doha: The Gulf’s Overnight Sensation

In a span of half a century, Doha, the capital city of Qatar, transformed itself from a small, obscure fishing village to a glitzy world city riding the wave of a services-oriented capitalist world-economy. Catapulted by the discovery of oil, and then gas, Doha has diversified its booming economy while attracting migrant workers across all skill levels. Its story is one of opportunism, reinvention, and creativity.

Scholars (Rizzo 2013; Wiedmann, Salama and Thierstein 2012) divide Doha’s history into numerous phases when analyzing its urbanization. For the purposes of this piece, though, two divisions suffice: Doha before and after the discovery of oil and gas. This is not a simplification. Many of the time periods identified by the likes of Rizzo and Wiedmann, or Salama and Thierstein, are in the post-oil timeframe. Both groups break down post-oil Doha according to the economic booms and busts the Middle Eastern city underwent. From a world-systems perspective, these are cyclical and part of the capitalist world-economy that Doha – or any city for that matter – is a part of. These categorizations are hence rendered inoperable since a world-systems approach calls for a holistic examination of breaks or fissures in the global economy. Analyzing them in those separate timeframes would deviate from a world-systems logic.

5.2.1 Pre-oil and Gas Doha: Of pearls and Tradition

Like most colonial possessions during the age of empire, Qatar was both romanticized and maligned by travelers in their accounts. Nineteenth-century romantic literature on the Orient was popular in the early to mid-20th century. Accounts of Qatar's founder, Sheikh Abdullah bin Jasim Al Thani, surrounded by members of his beautiful harem and laying on silken cushions and piles of pearls (Adham 2008, 219), embodied this romanticization. At the same time, travel writers like Wilfred Gifford Palgrave wrote about the island's barren land, harsh weather, and scarcity of human and natural resources (Adham 2008, 220). The simultaneous processes of romanticization and maligning are emblematic of Orientalist attitudes¹ harbored by Qatar's British colonists, who later seized the economic opportunities brought about by the discovery of oil until the peninsula gained independence in 1971.

Doha's beginnings could be traced back to the Al Thani clan's² founding of a fishing village in 1847 called Al Bidaa, on the eastern coast of the peninsula close to a fresh water source (Wiedmann, Salama and Thierstein 2012, 38). Within two decades, the prosperous pearl trade in the area pitted the Al Thanis against the rival Al Khlaifa tribe, prompting the British to sign a contract with the Al Thani clan, who would recognize the Empire's dominion and help safeguard its key trading routes in the area (ibid.). Qatar, though, would formally remain a part of the Ottoman Empire until 1916.

Unlike many other British-influenced cities like Colombo, New Delhi, or Rangoon, Doha's urban plan was not colonially influenced. Instead, form followed tradition. Al Bidaa, later renamed Doha, did not follow either formal planning or centralized regulations as they are known today (Salama and Wiedmann 2013, 66). Courtyard houses were as close to each other as possible, reflecting the settlement's communal character, expanding into neighborhoods that connected to its spine – the

market, port, and mosque (Salama and Wiedmann 2013, 65-7). Doha went largely unchanged until the discovery of oil in 1937 (Wiedmann, Salama and Thierstein 2012, 40). While the pearl industry helped sustain the settlement's growth and ushered in an era of "fledgling capitalism" which the city's economic and social structures revolved around (Adham 2008, 222), it did not significantly alter the growing city's urban plan.

The pearl industry did, however, introduce Doha's inhabitants to the drive for profit. A new form of capitalism created new societal structures that would co-exist with communalism. Pearling created a new division of labor with a workforce selling its manpower, as well as a new class of capitalists able to increase the number of expeditions for pearls (ibid.). The budding city also became subjected to capitalism's booms and busts. In the first decades of the 20th century, what was then Al Bidaa had a population estimated between 2,000-12,000, which rapidly decreased in the 1930s due to the creation in Japan of cultured pearls (Wiedmann, Salama and Thierstein 2012, 38). Between 1908 and 1939, the combined population of the towns that eventually became Doha increased only by 1,000 (Nagy 2000, 128). During that period, Qatar's population shrunk from 27,000 to less than 16,000 (Wiedmann, Salama and Thierstein 2012, 38) – nearly the number of inhabitants in Doha alone at the turn of the century.

5.2.2 Post-oil and Gas: A Megacity is Born

Accounts vary regarding the exact time oil was first discovered in Qatar. But by the late 1930s, Petroleum Development Qatar began production after oil was discovered near the western city of Dukhan. The first profits from oil production were invested in infrastructure. A road connecting the Dukhan field to Doha and an international airport east of Doha were built with the revenues generated by oil (Wiedmann, Salama and Thierstein 2012, 41).

The job opportunities brought about by the production of oil set off a wave of immigration to the peninsula. “Petro-urbanism” drove the urbanization of Doha, which required a larger and more highly skilled labor force to fill jobs in a range of industries, from petroleum to services. In 1939, only 39 percent of Qatar’s population was born outside the country; by 2000, eight in 10 people were foreigners (Nagy 2000, 128). The demand for foreign labor was in large part fueled by Qatar’s lack of a competitive indigenous workforce. Non-Qataris were estimated to make up nine-tenths of the entire workforce in 1970 because of a dearth in educated locals, who mostly relied on subsidies from fossil resources for a living (Wiedmann, Salama and Thierstein 2012, 41). In 1970, two years before Qatar declared its independence, Doha’s population was around 85,000, and two in every three inhabitants were non-Qatari (Adham 2008, 226).

As of 2015, Metropolitan Doha, composed of the municipalities of Doha, Rayyan, Al-Wakra, Umm Salal, and Al Dayeen, has a population of two million (Ministry of Development Planning and Statistics 2015). Since Qatar does not provide national and city-level population data by nationality, demographic data must come from individual countries’ embassies and consulates. The latest consolidated reports indicate that Qataris represent only 12 percent of the entire national population. Furthermore, Indians and Nepalis outnumber local Qataris in their own country (BQ Magazine, 2014). And because Doha is Qatar’s socio-economic and political hub, it is safe to infer that the city’s demographics reflect national-level data.

The city’s population structure is not expected to change in the coming years. A more reasonable expectation would be population increase, with both high and low skilled workers in even greater demand because of Doha’s massive, petro-urban

expansion. Qatar managed to survive the cyclical surges and slumps of global oil prices. The first oil crisis in 1973 jolted the world economy as prices per barrel increased from \$2.70 to \$11 within a year (Statista 2016). As a result, Qatar made over \$600 million in revenues in 1972, \$1.8 billion in 1974, and more than \$5 billion in 1980 – a year after the second oil crisis (Adham 2008, 228). While the rest of the non-oil-producing world reeled from the price shocks of such an essential commodity, Qatar reaped the benefits of its primary resource, which helped fuel a construction boom and, unprecedentedly, the influx of foreign [mainly Western] planners to shape the future development of the city (Rizzo 2014, 51). Consultancy projects involving firms from Lebanon and the United States that outlined city center, heritage conservation, and physical development masterplans never materialized, however, as what Adham calls the “urbanity of stagnation” (2008, 225) took hold of the peninsula. In the mid-1980s, oil prices swung the other direction, slumping by more than 50 percent from \$27 dollars a barrel in 1985 to \$13.5 in 1986 (Statista 2016).

Doha officials scaled back on their grand urban visions, instead focusing on maintaining the welfarist policies they had started. Part of their program involved giving every Qatari citizen a plot of land and an interest-free loan to build a house (Adham 2008, 235). The mega-construction plans of the 1980s were put on hold to accommodate a burgeoning population through housing, infrastructure, and public amenities, as well as oversee the geographical growth of the city, which had grown by 20 square kilometers in the 1980s (Adham 2008, 234, 236).

Aside from the stabilization of oil prices after the first Gulf War, Qatar began developing another natural resource it had discovered in the 1970s: gas. Shared with Iran, the North Field natural gas condensate field is the largest in the world. The

production of liquefied natural gas started in 1991 after the completion of Ras Laffan Industrial City (Wiedmann, Salama and Thierstein 2012, 46), which continued to draw foreign workers into the peninsula. But while the export of oil and gas still account for more than half of the country's GDP (ibid.), efforts to diversify and liberalize the economy were underway by the mid-1990s, in large part due to the rise of a less conservative ruler (Rizzo 2013, 536), Hamad Bin Khalifa Al Thani, in 1995. The construction of non-oil and gas mega-projects was in full swing.

With “instant urbanism”³ (Rizzo 2014, 52) came a host of ultra-developments spanning the knowledge, real estate, and tourist industries. Education City, on the northwest of Doha, is home to branches of American universities such as Carnegie Mellon University, Texas A&M University, and Virginia Commonwealth University. Its two subsidiaries, Qatar National Research Fund and Qatar Technology and Science Park, promote science and research and have already attracted global corporations like GE and Microsoft (Wiedmann, Salama and Thierstein 2012, 49). Doha's real estate boom is embodied by the Doha Exhibition Centre, Qatar Railways Project, and the planned city of Lusail (Wiedmann, Salama and Thierstein 2012, 50). While some of these projects, such as the Lusail International Circuit⁴, is likewise a crucial part of part of Doha's fledgling tourist industry, the city has also made a concerted effort to boost its cultural and contemporary cityscape. Beginning with the 2,200-hectare Hamad International Airport, which was inaugurated in 2014, Doha has signified its intent to attract not just services and manpower, but tourists as well. New highways, ports, and a planned metro system (Rizzo 2014, 52) serve as the infrastructure to connect tourists to the man-made Pearl of Doha, reinvented Corniche, I.M. Pei-designed Museum of Islamic Arts, and the renovated covered market, Souk Waqif.

These accessible, everyday places enable Doha tourism authorities to use cultural events and festivals as displays of traditional history and narratives to levy tourist itineraries all year round (Adham 2008, 240-41). Doha's urban spectacle, as Adham (2008) calls it, encompasses very diverse industries and facets of city life. It also shows no signs of slowing down as investments in these industries have become not just a local undertaking, but a multinational one as well.

5.3 When Cities Rise and Fall: The Cases of Detroit and Doha

Detroit and Doha are on opposing economic, demographic, and geographical development trajectories. While the former could be characterized as a failed city, the latter is an up-and-comer in this urbanizing world. The brief surveys of Detroit and Doha illustrate some of the elements that constitute a city's rise and fall. This subsection highlights these points with the goal of substantiating the broader, large-N statistical analysis that follows this chapter.

5.3.1 Urban Growth/Decline: When Economics, Demography and Geography Meet

Urban growth is not just economic growth. The same holds for urban decline. As the two above cases illustrate, economics is one facet of urban growth/decline. The cases show that economics, demography, and geography all contribute to the rise and fall of Detroit and Doha. This subsection attempts to highlight their roles to arrive at a multifaceted operationalization of urban growth and decline.

The economic rise of Detroit and Doha in the early part or the middle of the 20th century, respectively, is evinced by several factors that are arguably associated with each other. These include the rise in employment, spending power, infrastructure

development, and the proliferation of firms specializing in both cities' respective industries.

Several structural factors contributed to both cities' economic ascent. In the case of early Detroit, the capitalist world-economy had yet to move towards flexible specialization. Instead, the early 20th century was, not coincidentally, named after one of Detroit's primary economic catalysts, Henry Ford. Fordism was characterized by mass production at low prices for large markets primarily through assembly lines (Knox, Agnew and McCarthy 2014, 126). This structural economic configuration required larger companies and ushered in a flurry of mergers (Knox, Agnew and McCarthy 2014, 129), which was exactly what happened in Detroit. Also, the Fordist regime of accumulations⁵ entailed an economics of agglomeration to take advantage of minimal labor costs – another characteristic of Fordist economics (see Jessop 1992, 44). Detroit was hence a prime location for economic growth as it was at the heart of the manufacturing belt, its heavy industries, and market of consumers.

Doha, meanwhile, took advantage of a resource that was, and still remains, critical to the global economy. Ironically, this is more prominent in the Kondratiev B phases [or periods of economic contraction] that the world-economy endures roughly every 20 years. Qatar's opportunism is made no less clear by Qatar's entrance into the Organization of the Petroleum Exporting Countries in 1961, a year after the global cartel was founded. Profits from the production and price controls of oil filled up government coffers and turned Qatar into a welfare state, with Doha at its center. The capital city's economic development was fast-tracked by the two oil crises that stymied the capitalist world-economy. Roads were constructed to facilitate transport between Doha and oil depots. Qatar's first international airport was built in Doha to

increase connectivity with the rest of the Middle East and the world. The rest of the world's bane is Doha and other oil producers' boon. Especially in phases of economic contraction, Doha and most of the oil-producing cities and nations experience economic upsurges, while the rest of the world slows down.

Detroit's urban decline is more pronounced than any period of stagnation in Doha's history. Job loss/outsourcing and unemployment, the closing of businesses and industries, and declining incomes have characterized Detroit since its fall in the 1960s. Offices once located at the heart of the city center fled for the suburbs, other parts of America, or the world. Its automotive industry also caved in as primary headquarters and factories moved to more prominent financial centers and cost-friendly cities.

While racial tensions and public distrust of local government sped up the Motor City's economic decline, structural factors also influenced it. The crisis of Fordism ushered in a different capitalist phase where "the expansion of mass production led to an increasing globalisation of economic flows which made national economic management increasingly difficult...[and] the consumption pattern has gradually changed towards a greater variety of use values" (Nielsen 1991, 24). The decentralization of the automotive industry, which for a long time called Detroit home, was one of the changes in mass production processes that adversely impacted the city. It offered both established and new entrants to the industry a multitude of choices on where to set up their factories and facilities. Different car parts could be assembled practically anywhere in the world instead of in the sprawling factories that Detroit once housed.

Demographic changes also helped shape urban growth and decline in the two cities. From their nascent phases, Detroit's automobile industry and Doha's oil and

energy sectors attracted workers from within the United States and across Asia, respectively. The demand for workers, and thus, creation of new jobs, was tied to economic growth. As the above cases detail, both Detroit and Doha experienced massive population surges as their industries developed. For Detroit, population change was attributable to internal migration patterns, with many new residents coming from other parts of the country. The situation in Doha, like in other emerging Middle Eastern cities, was different. The petroleum and energy sectors attracted foreign labor from countries such as India, Nepal, the Philippines, and other mostly Asian and Middle Eastern nations. Unlike Detroit, there was very minimal domestic migration to Doha from other Qatari towns. Its population explosion was a result of international labor migration driven by booming oil/energy and, eventually, non-petroleum sectors such as construction and services.

Geographic growth and decline are only discussed in general terms across the literature. Cities “grow” or “expand” in land mass, but specific data on how much growth or expansion are limited. However, geographic growth or decline could be deduced from a host of other measures. Urban sprawl, suburbanization, land reclamation, and linkages to other metropolitan areas are some examples. In the case of Detroit, for instance, the city itself neither expanded nor contracted geographically during its decline. Suburbanization “expanded” the Detroit Urban Area to include parts of Macomb, Oakland, and Wayne Counties, as discussed earlier in this chapter. But Detroit itself did not experience geographic expansion or contraction. Doha, for its part, is symptomatic of many emerging world cities, where land area is increased as a result of reclamation projects. Cities as diverse as Manama and Shanghai, to Dubai and Singapore, have all reclaimed land to accommodate business centers, high-value

property markets, and tourist spots. Doha is no exception. The idea of geographic growth is therefore clearer when instances of land reclamation take place.

Economic, demographic, and geographic growth and decline immensely contribute to a more multi-faceted perspective of urban development. As shown by the case studies, they are likewise associated with each other. On the one hand, more jobs drive up the demand for more workers, leading to population growth. On the other hand, the departure of firms from a city center may or may not result in that city's geographic expansion. Whatever the permutation might be, all facets of growth impact one another.

5.3.2 Conclusion: The Role of the Global

Both Detroit and Doha could safely be described as single-industry cities during their early development phases. Detroit leaned heavily on the car industry, while Doha abandoned the pearl industry for petroleum in the late 1930s. Initially, both of these endeavors yielded immense benefits. Detroit not only attracted the country's largest automobile manufacturers and a labor base from across the United States, but also played a pivotal role in its country's World War II effort by becoming the nation's "Arsenal of Democracy." Its heavy industry – the backbone of the automobile sector – was a boon to the American war effort. Doha, meanwhile, transitioned from a pearl hunting economy to a petroleum-powered one, and has relied on it ever since. The discovery of gas and subsequent forays into different industries are relatively recent in Doha's *longue durée* history.

In response to the socio-political and economic turmoil that rocked Detroit in the 1960s, city officials embarked on an ambitious project to revitalize the city center and its immediate surroundings. Former mayor Coleman Young believed in the

mantra that big is beautiful. Aside from luring back automobile giants Chrysler and GM by setting aside large acres of land for their factories, he also oversaw the construction of sporting venues like the Joe Louis Arena and the new Tiger Stadium to invigorate the downtown area and retain professional sports teams (Savitch and Kantor 2003, 132-33). While these stadiums did not turn into white elephants, they were erected on loans – \$38 million from the federal government for Joe Louis Arena – and local and state funds – \$240 million for a dual baseball-football complex (ibid.). Detroit's strategy was to "sell" itself out of poverty (Savitch and Kantor 2003, 134). What it ignored was the fact that the world-economy was becoming more and more global, and less and less industrialized. Selling one's self out of poverty successfully would require drawing up a more globalized approach in view of deindustrialization.

This particular blueprint was employed by Doha. Qatar exported oil, and later natural gas, to the rest of the world, even to the point of controlling production and price levels along with other OPEC countries. Revenues from oil production were then used to diversify the economy. Doha gradually turned itself into a services hub open to the rest of the world. Its new infrastructure, from an international airport to tourist spots, was an open invitation to the world outside Qatar and beyond the Middle East. Doha had gone global, and the strategy seems to be paying off.

ENDNOTES

1 Orientalism was popularized by postcolonial thinker Edward Said in his eponymous work.

2 The Al Thani family was the leading family clan of the Al Maadhid tribe, which in the mid- to late-1800s was embroiled in conflicts with the Al Khalifa tribe (Wiedmann, Salama and Thierstein 2012, 38).

3 The term instant urbanism was coined to differentiate the process of urbanization in Gulf cities such as Doha, Abu Dhabi, and Dubai from its long-term, evolutionary Western counterpart (Rizzo 2014, 52). “Dubaization” and “Dubaification” are synonymous to instant urbanism; they all denote the emulation of Dubai’s embarkation towards mega-projects.

4 The Lusail International Circuit has been a fixture on the calendar of the Motorcycle World Championship [also known as MotoGP World Championship] since 2004, as well as other upper echelon racing series.

5 Jessop parsimoniously defines a regime of accumulation as “a macroeconomic regime sustaining expanded reproduction” (1992, 43).

Chapter 6

DATA AND FINDINGS

The literature has established that air freight and economic indicators such as national GDP covary. Outside of the claims made by the aerotropoli camp, would air freight and local GDP covary, and why? Under what conditions would air freight and the other dependent variables – population, employment, and green area – positively covary? What if air freight and the same dependent variables do not covary, a possibility that would run counter to the literature on airports and cities? This chapter explores these permutations empirically through a series of linear regression models.

Outside of the issue of diminishing sample sizes once the variable port container traffic is added to the multiple linear regression model, an equally important reason for creating two sets – one with and one without it – is based on the literature. The long view history of cities and their evolution as entrepôts involves moving goods via seas. The same mode of transport still exists today, side-by-side with rail and air transport. To incorporate as much of the contemporary reality of distributing commodities as possible, while still testing for the effect of air freight on growth, two sets of regression models will be run.

6.1 Regression Models with Larger N Samples (Without Port Container Traffic)

Two sets of multiple regression models were run to test the correlation between air freight and the four measures of urban growth stated in the previous chapter: GDP per capita growth between 2000-2014 [EC₁], employment rates between

2000-2014 [EC₂], the rate of change in a city's population between 2000 and 2015 [DC], and the percent change in cities' green area per one million people from 2000-2014 [GC]. The first set of regression models does not include the independent variable port cargo traffic because it would diminish the number of valid cases resulting from lack of data for almost two-thirds of the sample of cities. The regression equations are as follows:

$$DC = ACT + GCN + GDPC + UNE + POL + PAF + NAT$$

$$EC_1 = ACT + GCN + GDPC + UNE + POL + PAF + NAT$$

$$EC_2 = ACT + GCN + GDPC + UNE + POL + PAF + NAT$$

$$GC = ACT + GCN + GDPC + UNE + POL + PAF + NAT$$

Where DC is demographic change; EC₁ is economic change [GDP per capita, city-level]; EC₂ is economic change [city-level employment]; GC is geographic change; ACT is air cargo throughput; GCN is global connectivity scores; GDPC is GDP per capita, national-level; UNE is unemployment rate, national-level; POL is Polity IV scores; PAF is passenger air flows; and NAT is new airport or terminal built

The resulting statistical analysis also takes into account collinearity, which is measured in tolerance. Multicollinearity is present when at least two independent variables are conceptually related to the point that they end up measuring the same phenomenon. This could lead to issues in the regression model since one of the assumptions of multiple linear regression is no [or limited] multicollinearity. A tolerance level of .10 or lower indicates that multicollinearity is present in the regression model (Regression Diagnostics).

Without port container traffic, the number of cities across equation DC is 130, down from the original sample size of 150 due to missing data across several independent variables. The regression statistics for DC are in Table 6.1. Table 6.1

indicates that the independent variables in the equation account for .429 of the variance in the dependent variable.

The hypothesis that air cargo throughput leads to an increase in urban population, however, is called into question by the regression statistics. Air cargo is not a significant predictor of population change, as shown in Table 6.1. The significant variables in the model are national GDP per capita, Polity IV scores, and air passenger traffic.

Table 6.1: Regression Co-efficients and Standard Error Scores for Demographic Change [Population Growth]

Variables	Population change	Collinearity (tolerance)
Constant	.251 (.061)	
Air freight	.009 (.007)	.867
GDP per capita	-.085 (.018)**	.459
National unemployment rate	-.084 (.042)	.844
New airport (1 = yes)	-.011 (.065)	.865
Gross connectivity network scores	.000 (.000)	.903
Polity IV scores (1 = autocracy)	.587 (.079)**	.564
Passenger traffic	.047 (.015)**	.543
R = .678 Adjusted R square = .429 N of cases = 130 Sig. = .000		

Note: **p less than or equal to .01

Table 6.2 pertains to EC₁, the regression equation with city GDP per capita growth rate as the dependent variable. Table 6.2 shows that .832 of the variance in city GDP per capita is explained by the independent variables in the model, a very high score for a social scientific phenomenon being described.

Similar to the regression equation involving population growth, air cargo throughput is not a predictor of personal income level, or city GDP per capita. Table 6.2 shows that the lone significant predictor of urban personal income level is national GDP. A one percent increase in city GDP per capita leads to a 1.5 percent growth in national GDP per capita.

Table 6.2: Regression Co-efficients and Standard Error Scores for Economic Growth [GDP per capita, city-level]

Variables	City GDP per capita	Collinearity (tolerance)
Constant	.004 (.003)	
Air freight	.000 (.000)	.890
GDP per capita	.015 (.001)**	.376
National unemployment rate	-.005 (.003)	.829
New airport (1 = yes)	-.001 (.004)	.878
Gross connectivity network scores	.000 (.000)	.894
Polity IV scores (1 = autocracy)	.002 (.005)	.479
Passenger traffic	.000 (.001)	.540
R = .918 Adjusted R square = .832 N of cases = 115 Sig. = .000		

Note: **p less than or equal to .01

EC₂ is the second regression equation on urban economic growth, representing the dependent variable city employment rate. Table 6.3 reveals that .456 of the variance of urban employment rate is accounted for by the variables in the model, another strong R² value.

The statistics in Table 6.3 challenge the hypothesis that air cargo throughput leads to higher urban employment. As is the case with the two regression equations

above, air freight does not result in urban employment growth. The only significant variables in the model are the Polity IV scores and passenger traffic.

The last dependent variable hypothesized to be an effect of air cargo throughput is green area in sq. meters per 1M people, or E4. The model, though, only has 63 cases due to the lack of data for the dependent variable. In addition, the variable Polity IV was also eliminated from the model because each city with data on green area belonged to a democratic country.

Table 6.3: Regression Co-efficients and Standard Error Scores for Economic Growth [employment growth rates, city-level]

Variables	City employment growth rate	Collinearity (tolerance)
Constant	.008 (.003)	
Air freight	.000 (.000)	.890
GDP per capita	.001 (.001)	.376
National unemployment rate	-.002 (.003)	.829
New airport (1 = yes)	-.001 (.004)	.878
Gross connectivity network scores	.000 (.000)	.894
Polity IV scores (1 = autocracy)	.023 (.005)**	.479
Passenger traffic	.002 (.001)**	.540
R = .700 Adjusted R square = .456 N of cases = 115 Sig. = .000		

Note: **p less than or equal to .01

Table 6.4 shows that .149 of the variance is due to the independent variables in the model. Despite the reduced number of cases relative to the other three dependent variables, it is still significant.

Three variables – national GDP per capita, national unemployment rate, and air freight – can lead to geographic growth/decline. Holding all other variables constant, a one percent increase in GDP per capita and unemployment rate leads to a 7.2 and 7.9 percent fall in green area per one million people, respectively. Under the same assumption, for every one percent increase in air freight, green area increases by half a percent.

Table 6.4: Regression Co-efficients and Standard Error Scores for Geographic change [Green Area]

Variables	Green area per 1M people	Collinearity (tolerance)
Constant	-.113 (.028)	
Air freight	.005 (.002)**	.897
GDP per capita	-.072 (.027)**	.738
National unemployment rate	-.079 (.032)**	.789
New airport (1 = yes)	-.008 (.030)	.939
Gross connectivity network scores	.000 (.000)	.838
Passenger traffic	.006 (.008)	.782
R = .480 Adjusted R square = .148 N of cases = 63 Sig. = .019		

Note: **p less than or equal to .01

6.2 Regression Models with Smaller N Samples (Port Container Traffic)

The only change in this series of regression equations is the introduction of port container traffic as an independent variable. The sample of cities in these models gets even smaller because of the 1) difficulty in retrieving port container traffic data; 2) the fact that not all ports are capable of handling bulk containers, measured in Twenty Foot Equivalent Units [TEU]; and 3) the reality that not all cities are port cities to begin with.

The labels for the equations including port container traffic are the same as those without it:

$$DC = ACT + GCN + GDPC + UNE + PIV + PAF + NAT + PCO$$

$$EC_1 = ACT + GCN + GDPC + UNE + PIV + PAF + NAT + PCO$$

$$EC_2 = ACT + GCN + GDPC + UNE + PIV + PAF + NAT + PCO$$

$$GC = ACT + GCN + GDPC + UNE + PIV + PAF + NAT + PCO$$

Table 6.5 shows the statistics for demographic change. The N of cases is 60, and the independent variables in the sample explain .497 of the variation in the dependent variable, a very strong value in the context of International Relations/International Political Economy.

Table 6.5: Regression co-efficients and standard error scores for demographic change [population growth, with port cargo traffic in model]

Variables	Population change	Collinearity (tolerance)
Constant	.205 (.090)	
Air freight	.140 (.032)**	.403
GDP per capita	-.068 (.026)**	.372
National unemployment rate	-.053 (.067)	.800
New airport (1 = yes)	-.065 (.080)	.770
Gross connectivity network scores	.000 (.000)	.698
Polity IV scores (1 = autocracy)	.439 (.124)**	.395
Passenger traffic	.005 (.020)	.543
Port container traffic	.000 (.000)	.413
R = .752 Adjusted R square = .497 N of cases = 60 Sig. = .000		

Note: **p less than or equal to .01

The original hypothesis of air freight leading to demographic change is validated, as also seen in Table 6.5. Specifically, a one percent increase in air freight causes a 14 percent increase in urban population [when controlling for ports]. Two other variables – GDP per capita and Polity IV scores – are also highly significant determinants of changes in population.

The statistics for E_6 , which represents the regression equation with urban GDP per capita growth/decline as the dependent variable, are found in Table 6.6. It shows that .814 in the variation in city GDP per capita change – a very strong value – is associated with the presence of the set of independent variables in the model.

Table 6.6 also calls into question the hypothesis that air cargo throughput causes a change in a city's GDP per capita. The regression model for urban GDP states that the only significant variable is national GDP per capita. A one percent increase in national GDP per capita results in a 1.6 percent rise in city GDP per capita.

Table 6.6: Regression co-efficients and standard error scores for economic growth [GDP per capita, city-level, with port cargo traffic in model]

Variables	City GDP per capita	Collinearity (tolerance)
Constant	.003 (.006)	
Air freight	-.001 (.002)	.382
GDP per capita	.016 (.002)**	.368
National unemployment rate	-.006 (.004)	.776
New airport (1 = yes)	.000 (.005)	.766
Gross connectivity network scores	.000 (.000)	.706
Polity IV scores (1 = autocracy)	-.001 (.008)	.359
Passenger traffic	-.001 (.001)	.409
Port container traffic	.000 (.000)	.411
R = .918 Adjusted R square = .814 N of cases = 54 Sig. = .000		

Note: **p less than or equal to .01

Table 6.7 displays the variation in the other economic change variable, city employment, accounted for by the independent variables. The adjusted R square value of .543 is relatively high for quantitative international relations. Also, change in urban employment is caused by different variables in the equation, as shown in Table 6.7. More specifically, the hypothesis that air freight drives changes in city employment rates is supported, holding all other variables constant. A one percent increase in air freight causes a 0.7 percent hike in city employment rate.

Table 6.7: Regression co-efficients and standard error scores for economic growth [employment growth rates, city-level, with port cargo traffic in model]

Variables	City employment growth rate	Collinearity (tolerance)
Constant	.009 (.005)	
Air freight	.007 (.002)**	.382
GDP per capita	.001 (.001)	.368
National unemployment rate	-.004 (.004)	.776
New airport (1 = yes)	-.003 (.005)	.766
Gross connectivity network scores	.000 (.000)	.706
Polity IV scores (1 = autocracy)	.014 (.007)	.359
Passenger traffic	-.001 (.001)	.409
Port container traffic	.000 (.000)	.411
R = .782 Adjusted R square = .543 N of cases = 54 Sig. = .000		

Note: **p less than or equal to .01

Table 6.8 shows that .001 of the variation in geographic change, or change in green area per one million people, is associated with the independent variables in the regression model. The adjusted R squared value is very low. Aside from the small N of cases [n = 24], the model is not significant. But because the objective of this study is to test a specific hypothesis, it is plausible to proceed with running a regression model despite these statistics.

Table 6.8 also reveals that, with port cargo throughput in the model, air freight no longer leads to increased green area. The Polity IV score variable, similar to the model without port cargo traffic, was also excluded from the analysis because it has a constant value across all 24 cases. Furthermore, not a single independent variable is significant, even if $p < .1$.

Table 6.8: Regression co-efficients and standard error scores for geographic change [green area, with port cargo traffic in model]

Variables	Green area per 1M people	Collinearity (tolerance)
Constant	-.093 (.045)	
Air freight	-.035 (.056)	.348
GDP per capita	-.067 (.036)	.592
National unemployment rate	-.068 (.070)	.258
New airport (1 = yes)	.018 (.039)	.724
Gross connectivity network scores	.000 (.000)	.724
Passenger traffic	.013 (.013)	.274
Port container traffic	.000 (.000)	.749
R = .552	Adjusted R square = .001	N of cases = 24 Sig. = .464

6.3 Findings

A remarkable observation from the data and results is the effect of port container traffic on the relationship between air cargo throughput and green area, urban population change, and urban employment. In other words, the absence or presence of the port cargo variable has influenced three of the four hypotheses this piece submits.

As presented in Section 6.1, the absence of port container data in the four regression models shows that air cargo throughput did not have a significant effect on changes in urban population, city-level employment, and city-level GDP per capita. Air freight, though, did lead to an increase in green area. When port container data was introduced into the regression equation, however, air freight did not have a significant relationship with green area. Table 6.9 notes the differences in Beta values and variance accounted for by the independent variables, with and without port container traffic.

Table 6.9: Comparison of regression models: Relationship between air freight and geographic change [green area] with and without port cargo traffic

Regression model	Air freight	Adjusted R square
Without port container traffic	.005 (.002)**	.149
With port container traffic	-.035 (.056)	.001

Dependent variable: Green area per 1M people; **p is less than or equal to .01

According to the regression models in Section 6.1, air freight does not lead to an increase in the urban population, personal incomes, or jobs. But, it has a positive correlation with green area. In Section 6.2, the presence of port container data shows that air cargo throughput is associated with higher levels of urban population and city-level employment, but did not have an effect on city-level GDP per capita and green area. Tables 6.10 and 6.11 indicate these changes.

This begs two questions. First, what could be gleaned from the so-called negative cases? If air freight does not lead to demographic or economic growth, what does this say about the burgeoning aerotropolis school of thought? Also, what are some of the policy implications of erecting multi-billion airports and cargo facilities if they do not necessarily result in higher incomes, jobs, or population influxes? Second, assuming that air cargo throughput and port container traffic are not collinear, which is depicted also in the analysis in Chapter 6, what are some plausible generalizations 1) from the relationship between the movement of goods by air and sea; or 2) their effect on various facets of urban growth?

Table 6.10: Comparison of regression models: Relationship between air freight and demographic change [urban population] with and without port cargo traffic

Regression model	Air freight	Adjusted R square
Without port container traffic	.009 (.007)	.429
With port container traffic	.140 (.032)**	.497

Dependent variable: City population; **p is less than or equal to .01

Table 6.11: Comparison of regression models: Relationship between air freight and economic change [urban employment rate] with and without port cargo traffic

Regression model	Air freight	Adjusted R square
Without port container traffic	.001 (.001)	.456
With port container traffic	.007 (.002)**	.543

Dependent variable: Urban employment rate; **p is less than or equal to .01

Chapter 7

OBSERVATIONS AND CONCLUDING REMARKS

The chapter begins with observations based on the literature reviewed, case studies, and regression analysis. Four generalizations are presented. While each of them do not aim at meta-theorizing, they speak to some issues characterizing cities around the world. The second sub-section brings up several policy implications derived from this dissertation's findings.

7.1 The “Negative” Cases

Holding all variables constant, and without the presence of a large seaport, air cargo is not significantly associated with demographic and economic change. This is remarkable on several fronts. Theoretically, this deviates from the assertions made by the aerotropoli school of thought. From Conway to Kasarda, scholars in this informal grouping claim that airports fuel economic growth by creating more jobs, drawing more people to fill those jobs, and attracting advanced producer services needing airport access, among others. If air cargo does not result in the demographic and economic developments the aerotropoli school predict, what component of the airport, or air travel, does?

The next logical assertion would be that passenger traffic is the component of air travel that leads to growth. However, holding all other variables constant, the data likewise do not show a significant relationship between passenger traffic and demographic, economic, and even geographic growth.

From a policy perspective, these findings raise the question as to why city and even national authorities invite private firms to offer billions worth of bids for airport projects. One of the umbrella groupings of urban theories in Chapter 2 is theory as representation. Perhaps, this could provide insight as to why cities invest heavily in their airports. The idea of global cities is not only empirically measureable, but also about image. As mentioned in Chapter 2, cities brand themselves as “global,” and one strategic way to back that up is by having a state-of-the-art airport. Quite literally, airports are the first grounds a passenger sets foot on after disembarking from her/his flight, so a global city must have an airport worthy of that billing.

Detroit is a prime example of a city with a new international terminal to boost passenger and cargo services in order to induce economic development. The McNamara Terminal, completed in 2002, has not augmented air cargo throughput, while the city is still plagued by an economic downturn and population loss. Air cargo throughput has dropped by 38 percent between 1995 and 2014 (ACI 1996; 2016), and city GDP, urban employment, and population are all on a downward spiral.

Another possibility emanates from the thought process set in motion by Molotch’s highly influential growth machine theory. As alluded to in Chapter 2, Molotch’s growth machine theory celebrates the role played by politically mobilized elites who help in the furtherance of urban growth and development under a neoliberal aegis. Coupled with the representational/image dimension of the global cities approach, it is not far-fetched to think that urban authorities are mistakenly convinced about the alleged economic benefits from the construction of a high-tech and aesthetically pleasing airport.

While the last two speculations are more plausible than hypothetical, the fact remains that the dissertation's findings on these negative cases raise more questions than provide answers. This should prompt scholars and even policy-makers to rethink assumptions about spectacular megastructures such as 21st century airports, and whether the return on investment is enough to justify, in the case of Detroit [among others], the destruction of homes and use of land for this purpose.

The broader “negative case” is equally remarkable. The combination of the case studies and large data analysis reveals that airports do not necessarily lead to urban upswings, but rather, could sustain growth. There are numerous examples to substantiate this observation. From the case studies, Doha's Hamad International Airport was completed during an economic upswing resulting from the construction or building boom (As Michael Fahy states in a *The National [UAE]* story on July 12, 2015). In Zhengzhou, China, Zhengzhou New & Hi-Tech Industries Development Zone, the largest of three industrial zones, was planned and established before the opening of the Zhengzhou Xinzheng International Airport in 1997. The Zhengzhou New & Hi-Tech Industries Development Zone continues to encourage activities in software and information technology. Two other industrial zones were created after Zhengzhou's international airport was inaugurated. A parallel yet interesting case is Kuala Lumpur, Malaysia. The Kuala Lumpur International Airport broke ground in 1993, also in the middle of the city's [and country's] emergence as an “Asian Economic Tiger.” In 1998, it opened on the heels of the Asian Financial Crisis and a time of economic contraction. By the middle of the 2000's, however, it was not only on the road to recovery, but also the poster child of Southeast Asia's financial renaissance, with Kuala Lumpur serving as its command and control center.

The three examples above illustrate the greater possibility of airports helping sustain urban growth rather than leading it. In each of the three cities, urban growth was already considerable before its international airports even broke ground. This enriches the discussion on the relevance of airports to urban growth upswings or sustenance, an issue that arises following both the case studies and data analysis.

7.2 Air Freight and Green Space

According to the data, air freight leads to an increase in green space when seaports are excluded from the regression model. Change in green area is one of the dimensions of this dissertation's conceptualization of urban growth. And, as the data show, this transpired, but only in cities without a seaport. It is logical to surmise that green area increases due to heightened economic activity. A city's physical boundaries are not unchanging. They increase in times of economic growth, as is the case with Doha. The increase in green area could be a product of an expansion of a city's boundaries, or "go-green" policies aimed at promoting environmental protection in the midst of rapid economic growth.

Without ports and infrastructure to facilitate the movement of goods by sea, air cargo emerges as a significant mode of moving commodities. This is not to say that air cargo is the sole or exclusive means of transporting commodities, as railway networks exist in cities and hinterlands across the world. Firms and producers in cities connected by railways may find that distribution mode the most efficient means of transporting commodities. Rail transport has the advantage of carrying commodities by bulk at lower costs. In line with this, advanced producer services in cities logically seek out the most efficient way of moving commodities, especially when they trade with other firms or individuals across space disconnected by land. For advanced

producer services separated by oceans or vast distances, and without the option of moving goods via port containers, air cargo is the most rational and logical choice.

Stressing the points in the preceding paragraph in more concrete terms further underscores the theory presented here. According to Pearce (2011), air freight is 14 times more expensive than sea freight. Additionally, producers resort to air cargo because of opportunity costs and inventory-related costs, and/or only when commodities are perishable [i.e. food, fashion] and have time-definite requirements (ibid.). This does not imply that air cargo is a mere second option in relocating commodities. On the contrary, the absence of sea freight *and* the fulfillment of certain time- and capital-sensitive obligations makes air cargo indispensable to the functioning of advanced producer services and facilitation of the distribution side of global commodity chains. As emphasized throughout this research, the maintenance of global commodity chains is a staple of the capitalist world-economy and sign of robust economic activity.

7.3 Air Freight, Population and Jobs

The third and fourth observations are rooted in the positive relationship between air freight and urban population and urban employment when port container data is in the regression model. Since air freight is associated with an increase in both urban population and urban employment only when port cargo is present, a third possibility is that air freight's positive demographic and employment effects may only be applicable to megaport cities, defined as a city with both an international airport with regularly scheduled commercial and cargo flights, and a seaport capable of handling freight from oceangoing vessels.

On the surface, this may run counter to the second observation on the direct association of air cargo to green areas when the port traffic variable is excluded from the regression model. But that postulate does not deemphasize the positive economic effects port cargo throughput may have on cities. This does not say anything about port container traffic's effects on geographic growth, simply because it is based on a regression model that excludes port container traffic. In addition, if one wishes to push the point that transport by sea would always be preferred over air due to lower costs, port container traffic would lead to population and employment growth, not air cargo.

Because the introduction of port cargo traffic into the regression equation reveals air freight's significant impact on population growth and urban employment, generalizing using both these variables is only logical. The subsequent observation that air freight has positive effects on the population and employment only of cities with large ports is a substantial modification of the aerotropolis literature developed by Chang and Chang (2004) and Kasarda and Green (2004; 2005), among others. These scholars, as cited in Chapter 3, advance a correlation – not causation – between air cargo movement and economic growth while also hinting at directionality. The findings of this dissertation narrow down which types of cities experience which forms of growth. The above authors' assertions could be interpreted as being made narrower or more specific by the data generated here. Their theorization is hence qualified: not just any kind of city experiences any kind of economic growth. It must be noted that the other facet of economic growth – urban GDP per capita growth – is not an effect of air cargo throughput, with or without sea freight.

The fourth observation, also derived from the demographic and employment effects of air freight when port traffic is present, revolves around the idea of nodes in a

network of cities. At this point, it is worthwhile to review the usage of terms and their meanings in this paper. Throughout the discussion, the notion of air cargo throughput as a proxy measure for global trade has been used. The transfer and distribution of commodities is accomplished by air cargo. Throughput, as first introduced in Chapter 1, refers to the sum total or volume of inbound and outbound goods via airport cities. These airport cities are nodes in the trade network: they are entrepôt cities that act in a nodal manner to facilitate or expedite global trade. Instead of using the term the way Kasarda does in full (2010), this piece has operationalized airport cities as amalgamations of proximate airports that serve a city¹.

Theoretically, then, what the data reveal is that cities function not just as entrepôts, or transshipment points where commodities are reshipped or redistributed. Usually employed in the context of port cities (Taaffe, Gauthier and O’Kelly 1996, 17), entrepôts serve a nodal function. The validation of two of the hypotheses, namely, that air freight leads to increases in urban population and employment in megaport cities, means that to a certain degree, commodities do end up in the cities and their hinterlands served by airports. While that exact degree cannot be ascertained through the results, what is certain is that the distribution of commodities is associated with more people and more jobs in cities. This is an indication that air freight circulates in and around urban areas.

To understand this last point more lucidly, it is important to review what exactly is transported over air. Chapter 3 lists the top commodities shipped over air: high-tech products, capital equipment, apparel, textiles, and footwear, and consumer products². Depending on the classification of products, other lists – though still topped by high-tech products and capital equipment – contain intermediate materials, and

refrigerated and non-refrigerated foods (Kupfer et al. 2009, 10). While one can make an argument that such commodities can still be re-exported or held in airports for future redistribution, the fact that they generate population growth and employment on a city level – but not national level – means that a significant amount of these goods is located in the city and/or its hinterlands. In other words, some high-tech products, capital equipment or intermediate materials are left in the city to create jobs and attract more people. A causal chain was drawn up in Chapter 33.

This non-entrepôt is more than just a purely airport city. According to the data, air freight only becomes a driver of employment and population in a megaport city. This has three implications.

The first implication pertains to the nuances of the findings. Why does air freight generate jobs but not necessarily higher incomes in megaport cities? A plausible response to this question has a lot to do with the relationship between the nature of new jobs and their corresponding wages. Airports may not necessarily be what Kasarda alludes to as “the wave of the future” (Baskas 2015), but transit hubs where commodities are processed and distributed. While this does not detract from any of the dissertation findings, it does offer a reality check on the functions airports serve in cities. Airports and increased air freight do generate more jobs. But most of these jobs, in turn, could be blue-collar, minimum wage-level work. A cargo loader or freight truck driver does not realistically earn as much as an air traffic controller or manufacturing plant supervisor. Going back to the causal chain in Chapter 3, the nature of new employment resulting from airports is mostly blue-collared, from freight handling to cargo delivery and intermediate or final stage commodity assembly work.

In other words, not all new jobs covary with increased per capita incomes. An increase in per capita income is related to the wage levels that the new jobs come with.

The second implication concerns the possible causal logic driving the positive correlation between air freight in megaport cities and both urban population and employment. To an extent, the causal logic is parallel to that of air freight generating jobs but not higher incomes in megaport cities. But oceangoing vessels that dock in megaport cities have bigger cargo spaces than airplanes. This requires much more workers to unload heavier crates than those unloaded in airports. The demand for labor is thus higher, and a population increase in megaport cities, particularly from their hinterlands and other towns, is not beyond the realm of possibility. The sea port is a jobsite itself: unloaders, customs inspectors, cargo unstuffing personnel, and warehouse custodians are just some highly sought after workers in a port area. Once sea freight has been sorted out, it needs to be delivered to the consignee or firm, a process known as import haulage. This requires more labor, too, in the form of haulers and truck drivers. Given the bulk of the goods shipped via sea, it is highly probable that many of the consignees are part of advanced producer services or firms in heavy industries. These firms likewise require workers for their day-to-day operations.

The third implication relates to the multimodality of cities, and how they have been theorized. Megaport cities are different from seaport cities, more colloquially known as inland ports. There are many port cities that do not have airports with commercial services within a 70-mile radius: Algeciras, Spain; Bremen, Germany; and Valparaíso, Chile come to mind. Also, there are non-megaport cities, or urban areas with ports incapable of receiving oceangoing vessels. Some examples include Memphis, TN, United States; Paris, France; and Toronto, ON, Canada. Megaport

cities, in the context of this discussion, have airports with regularly scheduled cargo and passenger flights.

The idea of multimodal cities, which in this dissertation refers to a city utilizing multiple forms of transportation to distribute goods, resonates with various schools of urban thought. These have been detailed in Chapters 2 and 3. As presented in Chapter 3, Conway (1977) envisioned a city that revolved around the airport. In his *magnum opus*, *Airport City*, he did not leave much room, both literally and substantively, for seaports. Kasarda and his colleagues were heavily influenced by Conway. Yet, they too deemphasized other modes of transport. Arguably, there lies the novelty of their work.

But, the data from this analysis suggest that air freight's positive demographic and employment effects only arise in a megaport city. Ideally, the availability of rail freight data could definitively lead to a broader concept of a megaport city where air cargo leads to bigger populations and more jobs. For now, suffice it to say that air cargo throughput's demographic and employment effects would only come to fruition in a megaport city. Examples of megaport cities from the sample include Bangkok, Jakarta, Manila, and Singapore. All these cities are Southeast Asian, and this geographical commonality makes it a potential field of further study.

Several urban theories discussed in Chapter 2 also speak to this theory. Positivist approaches to the city such as Burgess' concentric circles model and the metropolitan and regional governance schools emphasize land use, albeit in different ways, for various modes of transport. The concentric circles model allocates land use, including modes of transport, according to efficiency calculations. Metropolitan and regional approaches, meanwhile, stress the importance of decongesting the city and

creating space in between vital installations such as transportation hubs. What these lack, however, is precisely the contributions of Kasarda and the aerotropolis school.

7.4 Concluding Remarks

The appraised literature on airports and cities, the case studies, and quantitative analysis convey three points about the dissertation. While they do not aim to make broader postulates than the ones presented in the last section, they attempt to frame the dissertation in the broader literature of cities, airports, and the air cargo-growth nexus.

First, the dissertation helps develop a new metric for viewing world cities and “world city-ness.” The current trend in the world city literature is to find novel ways at conceptualizing and measuring how a city achieves world city status. This could only be achieved if supplemented by a quantitative metric. Air cargo throughput, as an indicator of global trade between cities, complements the work by Taylor, et al. (2011); Watson and Hoyler (2011); Grubestic and Matisziw (2012); and Malecki (2012), all of whom devise various metrics to support different kinds of city networks. In other words, the multi-dimensionality of cities, captured in Chapter 2, is enriched by yet another view of cities. In this instance, it is enriched by the incorporation of airports and a specific kind of airport activity: the transportation of goods via air.

Second, the generalizations made by the aerotropoli school about airports causing economic growth must be treated with some caution. As the dissertation shows, air freight is positively associated with urban employment under certain conditions, and has no effect on purchasing power. These conditions revolve around the presence of a large port in the city, and the combination of an international airport and a seaport capable of handling freight from oceangoing vessels is conceptualized as a megaport city. While scholars working under the tenets of the aerotropoli city posit

causality between airports and economic growth, this dissertation postulates that airports are correlated with urban growth under certain conditions.

Lastly, this dissertation modestly fills a void in the literature on global commodity chains. As Dicken accurately points out, distribution is “taken for granted,” remaining “hidden, mainly confined to the specialist fields of supply chain management and transportation” (2011, 399-400). Notwithstanding the fact that logistics is a \$4 billion industry (Dicken 2011, 400), it is an integral part of the commodity chain. It could be the end of a chain in some instances, and a means for greater capital accumulation, in others. Distribution is even made more significant by the earlier observation on airport investment. Time-space compression may be a hallmark of the 21st century world-economy, but speed and efficiency are the forgotten dimensions that compress time and space. Airports and cargo facilities expedite this process.

While more answers than questions are expected from scholars, both contribute to the existing knowledge base and generate intellectual movements to push the research agenda forward. This is most certainly applicable to a nascent field like airport cities, city networks and the distribution side of global commodity chains.

ENDNOTES

¹ See p. 69

² Cf. (Morrell 2012, 23; Sales 2013, xvii)

³ See p. 47

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Appendix A

THE WORLD'S 150 BUSIEST AIRPORT CITIES BY AIR CARGO THROUGHPUT

1. Hong Kong	51. Honolulu HI	101. Xi'An
2. Memphis TN	52. Ho Chi Minh City	102. Sanya
3. Shanghai	53. Hanoi	103. Lagos
4. Tokyo	54. Mexico City	104. Addis Ababa
5. Dubai	55. Hangzhou	105. Orlando FL
6. Seoul	56. Philadelphia PA	106. Ürümqi
7. Anchorage AK	57. Madrid	107. Salt Lake City UT
8. Guangzhou	58. Copenhagen	108. Rome
9. Los Angeles CA	59. Washington DC	109. San Diego CA
10. Louisville KY	60. Riyadh	110. San Juan
11. Paris	61. Zhengzhou	111. Wuhan
12. Taipei	62. Zurich	112. Guadalajara
13. Frankfurt	63. Seattle WA	113. Manaus
14. Miami FL	64. Kunming	114. Calcutta
15. New York NY	65. Munich	115. Penang
16. London	66. East Midlands/Nottingham	116. Jeju
17. Beijing	67. Xiamen	117. Shenyang City
18. Singapore	68. Madras/Chennai	118. Dalian
19. Amsterdam	69. Lima	119. Dublin
20. Chicago IL	70. Chongqing	120. Perth
21. Bangkok	71. Cairo	121. Hahn
22. Indianapolis IN	72. Santiago	122. Changsha
23. Doha	73. Johannesburg	123. Oslo
24. San Francisco CA	74. Phoenix AZ	124. Muscat
25. Leipzig	75. Tel-Aviv	125. Rio de Janeiro
26. Osaka	76. Boston MA	126. Fuzhou
27. Cologne	77. Bangalore	127. Haikou

28. Kuala Lumpur	78. Fukuoka	128. Medellin
29. Abu Dhabi	79. Melbourne	129. Brisbane
30. Istanbul	80. Nairobi	130. Panama City
31. São Paulo	81. Vancouver BC	131. Dammam
32. Dallas/Fort Worth TX	82. Tianjin	132. Karachi
33. Luxembourg	83. Sharjah	133. Harbin
34. Mumbai	84. Denver CO	134. Charlotte NC
35. New Delhi	85. Sapporo	135. San Antonio TX
36. Cincinnati OH	86. Tehran	136. Hartford CT
37. Jakarta	87. Bahrain	137. Tampa FL
38. Bogota	88. Auckland	138. Barcelona
39. Milan	89. Quito	139. Lisbon
40. Atlanta GA	90. Colombo	140. Surabaya
41. Liège	91. Vienna	141. Hyderabad
42. Manila	92. Portland OR	142. Las Vegas NV
43. Chengdu	93. Jeddah	143. Amman
44. Houston TX	94. Qingdao	144. Wuxi
45. Nanjing	95. Nagoya	145. Manchester
46. Moscow	96. Detroit MI	146. Beirut
47. Toronto ON	97. Buenos Aires	147. Nanning
48. Brussels	98. Minneapolis MN	148. Huntsville AL
49. Sydney	99. Kuwait	149. Zaragoza
50. Naha	100. Helsinki	150. Kansas City MO

Appendix B

COMPONENT AIRPORTS OF CITIES SERVED BY MORE THAN ONE AIRPORT

- All Chinese airports, unless otherwise indicated, have a base year of 2000 instead of 1995 due to unavailability of data
- Years in parentheses indicate the year of the data and/or data source
- Cities and airports not listed below have data from 1995 and 2014
- All three-letter airport codes are IATA codes

Barcelona = BCN + GRO + REU (Reus cargo data as of 1998)

Beijing = PEK + NAY

Brussels = BRU + CRL (2014)

Buenos Aires = EZE + AEP

Chicago = ORD + MDW

Cologne = CGN + DUS

Dallas = DFW + AFW

Dubai = DXB + DWC (2014)

Guangzhou = CAN + SZX

Houston = IAH + HOU + EFD

Istanbul = IST + SAW (cargo, 2014)

Jakarta = CGK + HLP

Kansas City = MKI + MKC (passenger flows only, 2015)

Kuala Lumpur = KUL + SZB (cargo, 2014 as it was Kuala Lumpur's only airport before 1998)

London = LHR + STN + LGW + LTN + LCY + OXF (passenger flows only, 2014) + SEN (passenger flows only, 2014) + BQH (cargo data 2014; passenger flows only, 2014)

Las Vegas = LAS + HSH (passenger flows only, 2014) + VGT (passenger flows only, 1995 and 2014)

Los Angeles = LAX + ONT + BUR + LGB + SNA

Manila = MNL + CRK (2014 only)

Medellin = MDE + EOH

Miami = MIA + FLL + PBI

Milan = MXP + LIN + BGY (BGY 1998 data)

Moscow = SVO + DME + VKO

New York = JFK + EWR + LGA + SWF + HPN (passenger flows only, 2014)

Orlando = MCO + ORL (passenger flows only, 2014) + SFB (passenger flows only, 2014)

Osaka = KIX + ITM + UKB (cargo, 2014)

Oslo = FBU (old Oslo Airport) + GEN (new Oslo) (1995)

Karachi = KHI + ZIZ

Paris = CDG + ORY + BVA

Phoenix = PHX + AZA (2014)

Portland, OR = PDX + PWM

Rio de Janeiro = GIG + SDU (2014)

Rome = FCO + CIA

San Francisco = SFO + OAK + SJC

San Juan = SJU + SIG (passenger flows only, 2014)

São Paulo = CPQ + GRU

Seoul = ICN + GMP (2014)

Shanghai = PVG + SHA

Taipei = TPE + TSA (2014)

Tampa = TPA + SRQ + PIE

Tehran = IKA (new, opened 2004) + THR

Tokyo = NRT + HND

Washington DC = IAD + BWI + DCA

Addis Ababa as of 1998 (ACI 1999)

Bangalore as of 2005 (ACI 2006)

Beirut as of 1998 (ACI 1999)

Bogotá data as of 2005b (ACI 2006)

Buenos Aires as of 1998 (ACI 1999)

Copenhagen as of 1998 (ACI 1999)

Dallas data for AFW as of 2000 (ACI-NA 2004)

Dammam as of 1998 (ACI 1999)

Doha cargo data as of 2000 (ACI 2001)

Guadalajara as of 1998 (ACI 1999)

Hahn as of 1998 ACI data (ACI 1999)

Hangzhou as of 2001

Hanoi as of 2005 (ACI 2006)

Ho Chi Minh City as of 2005 (ACI 2006)

Huntsville as of 1998 (ACI 1999)

Hyderabad as of 2008 (ACI 2009)

Johannesburg as of 1998 (ACI 1999)

Karachi as of 2000 (ACI 2001)

Liège as of 1998 (ACI 1999)

Lima as of 2000 (ACI 2001)

Medellin as of 2005 (MDE only for 2005 and 2014; ACI 2006)

Mexico City cargo as of 1998 (ACI 1999)

Milan-Bergamo as of 1998 (ACI 1999); Milan-Bergamo is part of Milan

Moscow as of 1998 (ACI 1999)

Nairobi as of 1998 (ACI 1999)

Orlando as of 1998 (ACI 1999)

Panama City as of 2005 (ACI 2006)

Penang as of 2000 (ACI 2001)

Quito as of 1999 (ACI 2000)

Santiago as of 1998 (ACI 1999)

São Paulo data excludes CGH (lack of data from 1995)

Sydney, Melbourne, Perth as of 1995 (Australian Bureau of Infrastructure, Transport and Regional Economics 2016).

Tehran as of 2008 (ACI 2009)

Wuxi as of 2004 (upon opening)

Appendix C

PORT CITY DATA: CITIES SERVED BY MORE THAN ONE PORT

- Years in parentheses indicate the year of the data and/or data source

Barcelona = Barcelona + Tarragona

Dammam = Dammam + Jubail

Guangzhou = Guangzhou + Shenzen

Ho Chi Minh City = Saigon Port Co. LTD + Saigon New Port

Istanbul –Ambarli

Istanbul = Ambarli + Haydarpasa

Jakarta = Tanjung Priok

Lima = Callao

London (2011 data)

Los Angeles = Los Angeles + Long Beach + Port Hueneme

Miami = Miami + Port Everglades

Mumbai = Jawaharlal Nehru + Mumbai

Panama City = Panama City + Balboa

Philadelphia = Philadelphia + Wilmington

Port Kelang = Kuala Lumpur

Rio de Janeiro = Rio de Janeiro + Sepetiba

San Francisco = Oakland

São Paulo = Santos

Seoul = Incheon

Sharjah = Khor Fakkan

Taipei = Keelung

Tokyo = Tokyo + Yokohama

Washington, D.C. = Baltimore

Appendix D
POPULATION DATA NOTES

“c” denotes census data

“e” denotes estimated data

“p” denotes projected data

- Years in parentheses indicate the year of the data and/or data source

Bahrain = Manama (Population 2001c and 2014e)

Bangkok (Population in 2000c and 2015p; metropolitan area population is recorded as census data seems underreported)

Chinese cities (Population in 2000c and 2010c)

Colombo (2001c and 2012c)

Dallas = Excluding Fort Worth

Doha (Metropolitan area; population in 2004c and 2015c)

Emirati cities (Population in 1995c and 2014e)

German cities (Population in 2001e and 2015e)

Hong Kong (Population in 2001c and 2015e)

Indian cities (Population 2001c and 2011c)

Indonesian cities (Population 2000c from: and 2010c)

Istanbul (Population 2000c and 2015e)

Japanese cities (Population in 2000c and 2015c)

Kuwait = Kuwait City (governorate level due to terminology; 2000e and 2016e)

Malaysian cities (due to differences in terminology, district-level populations were recorded, 2000c and 2010c)

Manila (Population 2000c and 2015c)

Muscat (governorate level due to terminology; 2003c and 2015e)

Saudi Arabian cities (1992c and 2010c)

Seoul = Excluding Incheon

Sharjah (Latest population is from 2010 estimate)

Singapore (Population in 2000c and 2016e)

South Korean cities (Population in 2000c and 2015c)

Taipei (Population in 2001e and 2015e)

US cities (population in 2000c and 2015e)

Vietnamese cities (Population in 1999c and 2009c)