Neoliberal Economic Reforms and Urban Sociospatial Change in Latin America: The Case of La Serena-Coquimbo, Chile

A Dissertation submitted in partial satisfaction of the requirements for the degree Doctor of Philosophy in Geography

by

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SERVICE


ABSTRACT

Neoliberal Economic Reforms and Urban Sociospatial Change in Latin America: The Case of La Serena-Coquimbo, Chile

by

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This research examines the location and spatial extent of different social classes in Latin American cities in the second half of the 20th century. The effects of economic and urban policy under import substitution industrialization and neoliberalism are investigated as they relate to urban form and sociospatial segregation.

The medium size urban area of La Serena-Coquimbo, Chile was used as the study area for empirical research. Social class maps were made through field observation and quantitative analysis of census data. Changes in sociospatial segregation was analyzed with the bivariate Ripley’s K(d) statistic.

Results of the research indicate that sociospatial segregation has increased over time due to neoliberal economic and urban policies. Changes in five factors contribute to this increase: income inequality, transportation, infrastructure, land use/land value, and housing policy.
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Chapter 1

Introduction

A. Introduction.

Latin American cities have grown at extraordinary rates since the turn of the century. As mortality rates fell and fertility rates remained high, the population of Latin America grew rapidly, increasing from 166 million in 1940 to 515 million in 2000 (United Nations 2000). Rapid population growth was accompanied by rapid urban growth. In 1940, roughly one-third of Latin Americans lived in cities (Gilbert 1994), but by 2000 this figure exceeded 75% (United Nations, 1999). Latin America is now a highly urbanized region. Therefore, understanding how and why cities grow is essential if we are to improve the lives of the majority of the region’s population.

Geographers have developed models that attempt to describe the form that Latin American cities have taken in the 20th century (Griffin and Ford, 1980; Bahr and Mertins, 1982; Arreola and Curtis, 1993; Ford 1996). These models generally illustrate where different social groups live, and where industrial, commercial, and other land uses are located. By understanding the form of cities, we can study housing, transportation, environmental quality, employment, and other urban quality of life issues.

Where people of different socioeconomic groups live is one of the most frequently discussed elements of Latin American urban models. Most models show that cities are organized by predictable patterns of residential location. The
wealthy, middle-class, and poor live in distinct parts of the city. Many authors have noted that residential patterns reflect the highly unequal nature of Latin America, where extreme income inequalities have manifested themselves as extreme sociospatial segregation (Portes, Itzigsohn, et al. 1994; van der Wusten & Musterd 1998). But while many authors mention sociospatial segregation as an important urban problem, there are few empirical studies that measure the degree of segregation, if it is increasing or decreasing over time, or the processes that cause it.

As a means of explaining urban form and sociospatial segregation we need to look at economic and urban policy in Latin America. Since the 1930s, there have been two distinct development paradigms at work in the region. Roughly between 1930 and 1980, the region was dominated by Import Substitution Industrialization (ISI). This strategy sought to industrialize the region by “substituting” foreign manufactured goods with locally manufactured goods (Thorp, 1998). Heavy quotas and tariffs were placed on imports, which protected local producers and allowed them to “catch-up” with producers in more advanced industrial nations. As a development paradigm, ISI justified state intervention as a means of improving the quality of life in Latin America. The free market was seen as having flaws, which should be corrected by the state. These ideas quickly expanded from state influence in trade policy to state influence in many segments of society, such as housing, transportation, urban planning, and other realms. By the early 1980s, problems with ISI led to a new
development strategy, one that relied on free markets and limited state intervention. This came to be known as neoliberalism (Corbo, 2000). Under neoliberalism, the state was largely replaced by the private sector, which was seen as more efficient in allocating limited resources and more likely to lead to economic growth. Trade policy shifted from protectionism to a focus on comparative advantage and exports. Likewise, the state reduced or eliminated its role in such activities as housing, transportation, and urban planning.

The strategies of ISI and neoliberalism should have had distinct impacts on urban form and sociospatial segregation. Descriptive models developed in the late 1970s and early 1980s (Griffin & Ford 1980; Bahr & Mertins 1982) have features that differ from those developed in the 1990s (Arreola and Curtis, 1993; Ford 1996). For instance, models developed in the 1990s show greater suburban development, which includes middle and upper class housing, shopping malls, and industrial parks. However, these models fail to explain why we see these differences. This research will explore the policies that have changed between ISI and neoliberalism and how they are affecting urban form and sociospatial segregation.

As can be seen, there is a significant gap in the literature that links Latin American urban growth and form to economic policy changes and impacts on urban residents. This dissertation will lead to theoretical and methodological advances in this uncharted realm of Latin American urban geography.
B. Statement of the Problem.

This research will examine the location and spatial extent of different social classes in Latin American cities in the second half of the 20th century. The effects of economic and urban policy under ISI and neoliberalism will be investigated as they relate to urban form and sociospatial segregation. In order to measure the social impact of these changes, this research will analyze changing access to jobs and commerce by social class. These methods will then be used to empirically study a rapidly growing medium size Latin American city.

C. The Study Site.

The study site for this research is the twin cities of La Serena-Coquimbo, Chile, approximately 300 miles north of Santiago (see Appendix A, Location Map). This study site was chosen for a number of reasons. First, Chile has taken the lead in promoting neoliberal economic policies in Latin America. Other countries in the region see Chile as a model for economic restructuring, making it an ideal location to study the impacts of neoliberal policies on urban form. Second, Chile has relatively accurate census data and readily accessible land use maps and aerial photography. These data sources are necessary for mapping and analyzing social class over different time periods. La Serena-Coquimbo was chosen because, with an estimated combined year 2000 population of roughly 290,000 people (INE, 2000), it is representative of mid-size Latin American cities. The export orientation of neoliberalism has caused more rapid growth in
medium-size cities, where agricultural, fisheries, and diversified industrial production occur (Portes, Itzigsohn, et al. 1994), and therefore they provide a good setting for studying economic effects on urban form. La Serena-Coquimbo has a diverse economy and a rapidly expanding population, based on port activity, administrative functions, and tourism.

D. Research Questions.

Goal #1: To determine how changes in economic policy create changes in urban form.

Problem:

Do neoliberal economic reforms lead to greater sociospatial segregation than ISI?

Sub-problems:

1. Has sociospatial segregation increased in Latin American cities during the late 20th century?

2. What urban/economic policies have changed in Latin America between ISI and neoliberalism?

3. Have policy changes had an impact on sociospatial segregation?

Goal #2: To examine how neoliberal economic reforms have affected access to jobs and commerce by social class.

Problem:

Has access to jobs and commerce decreased for lower income groups as a result of economic change?

Goal #3: To use a mid size city to empirically test Goal # 1 and Goal #2.
Problem:

Have neoliberal economic reforms led to increased sociospatial segregation in La Serena-Coquimbo?

Sub-problems:

1. Has sociospatial segregation increased in La Serena-Coquimbo during the late 20th century?
2. What urban/economic policies have changed in La Serena-Coquimbo during the late 20th century?
3. Have policy changes had an impact on sociospatial segregation in La Serena-Coquimbo?
4. Has access to jobs and commerce decreased for lower income groups as a result of policy changes in La Serena-Coquimbo?

E. Structure of the Dissertation.

The dissertation is divided into six chapters. This chapter has provided an introduction, statement of the problem, and research questions. Chapter 2, Economic Policy and Changing Urban Form in Latin America, discusses theoretical links between changes in economic policy and how they should affect urban form. It also provides a discussion of relevant literature and how this study will fill existing gaps. Chapter 3, Economic, Social, and Urban Change: Latin America and Chile, examines economic and urban policy in more detail. General regional patterns for Latin America, and the specific situation of Chile are discussed. Chapter 4 presents background information on La Serena-Coquimbo,
which sets the stage for the empirical study. Chapter 5, *Methodology*, explains how the research was conducted, including limitations of the data and assumptions that had to be made. Chapter 6, *Economic, Social, and Urban Change: La Serena-Coquimbo*, is an empirical study of the relationship between economic change and sociospatial segregation in a medium size Chilean city. Finally, Chapter 7, *Generalizations and Conclusions*, ties findings from the empirical study to likely changes in other Latin American cities.

**F. Contributions to Geographic Literature.**

This research will contribute to several areas of geographic research. First, it will help explain why we see differences between Latin American urban models developed in the late 1970s/early 1980s and those developed in the 1990s. Most models act as good snapshots of Latin American urban form, but provide little explanation as to why they have particular forms. Second, it will provide empirical measurement of sociospatial segregation in a Latin American city. Many Latin American urban researchers mention sociospatial segregation as a problem, but few have actually measured if or how it is worsening. Third, it will contribute to the contentious debate over impacts of neoliberal economic reforms in Latin America. Much research has focussed on impacts of the economic situation of lower-income groups, but little has been conducted on how reforms affect urban form and the residential location of different social groups.
Chapter 2

Economic Policy and Changing Urban Form in Latin America

A. Introduction.

This chapter presents an overview of the two major development strategies undertaken in Latin America during the second half of the twentieth century—import substitution industrialization (ISI) and neoliberalism. Changes in urban morphology, specifically sociospatial segregation, are then discussed as they relate to these economic policies. As a framework for the discussion of urban form, I use ecological models and neoclassical economic geography. These concepts are used to explain the likely impacts that ISI and neoliberalism have on urban form and sociospatial segregation in Latin America.

B. Sociospatial Segregation Defined.

The concept of sociospatial segregation can take many forms. In general, it refers to the spatial separation of social groups, primarily in reference to residential location. This division can be based on myriad social variables, such as wealth, race, ethnicity, immigration status, and religion (Muster and Ostendorf, 1998; Boal, 1998). Other types of segregation can be based on family status and lifestyle.

Traditionally in Latin America, segregation was tied to class and ethnicity (Butterworth and Chance, 1981). Communities were divided ethnically between
those with more Spanish/European ancestry and those with more Indian and/or Black ancestry. Class was also an important means of separating social groups, however, as Butterworth and Chance (1981) point out, the concept of class in this region is complex. Under Spanish colonialism, classes could be divided into two groups, an upper class *power-prestige* group, and a lower class *work-wealth* group. Actual wealth was less important than one’s family lineage and social customs—qualities possessed by those in the *power-prestige* group. As urban areas became dominated by commerce and industry, numerous examples developed of those from the *work-wealth* group having higher incomes than some of the *power-prestige* group. However, without family lineage and “proper” social customs, these people could never move to the higher *power-prestige* social class. This concept of class has weakened in contemporary Latin America. Increasingly, higher levels of middle class education and income are blurring the antiquated dichotomy between upper and lower classes. This makes upper-class ideas of superiority based on heritage and social customs alone more difficult to maintain.

In the case of contemporary Chile, income and wealth appears to be the strongest variable in measuring segregation—in contrast to ethnicity or heritage and social customs. The country is relatively homogenous racially and ethnically, with only a very small indigenous population, located primarily in the south. Furthermore, the class dichotomy described by Butterworth and Chance (1981) is less applicable to Chile and other Southern Cone countries, which
experienced high levels of European immigration in the 19th century. These immigrants weakened Spanish colonial concepts of class. Urban and economic growth in Chile, as in other Latin American countries, have further eroded these concepts.

It can also be argued that family status and lifestyle variables are also insignificant in Chile, especially in medium to small cities. As a whole, people live with their families until they are married and can afford their own residence. There are generally not enough households of university students, young childless couples, gays, or elderly for lifestyle oriented communities to form. Because of this, this paper uses material wealth as a means of measuring sociospatial segregation.

C. Economic Policy.

1. Import Substitution Industrialization in Latin America.

Social and economic conditions in Latin America changed rapidly during the first half of the twentieth century. Industrial expansion was increasing. Improvements in healthcare cut death rates in half and populations grew (Thorp, 1998). Population growth outpaced job opportunities in rural areas, while industrial growth began to expand opportunities in urban areas. These demographic and economic changes led to rapid urban growth as people migrated to urban areas in search of work (Gilbert, 1994). Yet, population and urban growth soon outpaced industrial and other employment growth, and Latin
American governments quickly realized that job creating development programs had to expand (David, 1997). Further industrialization was seen as the means to create jobs and improve the economic wellbeing of Latin Americans. Traditional reliance on the export of primary goods was highly unstable. A fall in the price of a key export good on the world market could have serious impacts on a nation’s economy. Theoretically, a diversified industrial economy, on the other hand, could better absorb external shocks in a single market.

The development theory that came to dominate Latin America, and many other less developed countries, during this time was developed by Raúl Prebisch (1959). His argument was that the world consisted of an advanced center (the United States and Europe) and a less developed periphery (Latin America and other regions). Economies of the center are technologically advanced and self-sustaining, while those of the periphery act solely as the suppliers of raw materials to the center. Prebisch argued that the periphery was in a disadvantaged position to promote development and industrialization. The price of raw materials that Latin America exported were not keeping pace with the cost of manufactured goods that it imported. This created serious balance of payments problems and inhibited the region’s ability to save and invest. Only through a process of “import substitution industrialization” (ISI) would Latin America be able to overcome its disadvantaged position.

ISI intended to replace imported goods with domestically produced goods (DiMarco, 1972). This would begin with technically simple production, which
would allow local producers to gain industrial experience (Ahmad, 1978). With time, production would become more technically sophisticated, allowing peripheral countries to develop industry on par with that of central regions. This would erase differences between the core and periphery and allow for greater social development as labor productivity and, therefore, wages increased.

The theory of ISI manifested itself in many ways, expanding into spheres of the economy beyond those prescribed by Prebisch. In line with the ideas of Prebisch, strong protectionist policies were established in order to reduce imports (Thorpe, 1998). This was accomplished through high tariffs on imported goods, which were created in order to protect domestic industry. But the state’s role in economic development soon expanded beyond import restrictions (Meier, 1994). State-owned companies increased, especially in large, capital intensive industries, such as copper in Chile (Martinez and Diaz, 1996). Governments also paid for or subsidized productive infrastructure, such as roads, telephone networks, energy supply and other public services (Thorp, 1998). State institutions grew as well, in order to aid industrial development. Government agencies were professionalized and the role of technical experts in economics, planning, management, and engineering was increased (Violich, 1987). New agencies were formed to assist in various sectors of the economy, such as development banks, technological institutes, and university research. These agencies, often with the financial assistance from industrial nations, were established to improve education, housing, water, and agriculture. ISI, therefore,
came to be associated not only with protectionist policies to promote local industrialization, but also with a strong state role in many aspects of the economy and society as a whole.

As ISI became the dominant development strategy in Latin America, some economists came to criticize the Prebisch model. Hirschman (1968) summarized these arguments by stating that ISI can function in two stages, the first an "easy" stage, and the second an "exhaustion" stage. The easy stage came as states encouraged low cost imports of capital goods, while prohibiting the import of finished goods. This gives local producers protections that allow rapid increases in output and profit in a protected domestic market. This does not last, however, as initial success leads to over investment and saturation of domestic markets. At the same time, more advanced industrialization requires more imports of capital, thus upsetting the balance of trade. Finally, advanced industries with high capital intensity require large markets, which small protectionist countries do not have.

In fact, economic growth did expand in the early stages of ISI. Between 1950 and 1960, per capita GDP in the region grew by 4.9% (Urrutia, 1991). Furthermore, a study by the Economic Commission for Latin America estimated that for Argentina, Brazil, Chile, Colombia, and Mexico between 1929 and 1960, import substitution was responsible for 36% of the increase in industrial output (Thorp, 1998).
However, by the 1970s, Latin America reached the exhaustion stage as described by Hirschman (1968). State industries were rarely profitable and protected industries were frequently inefficient. The shortfall between tax revenues and expenditures grew, creating an unsustainable economic situation. State debt skyrocketed, leading to dramatic economic restructuring in the 1980s. This was greatly exacerbated after 1973, as a result of a worldwide increase in the price of oil (Bethell, 1998). Oil prices quadrupled during this time and slowed growth throughout the world. Multinational banks sought to invest surplus assets received from OPEC, countries and Latin America was willing to use it for industrial and economic development. By 1980, Latin America had the greatest amount of debt in the developing world (Bethell, 1998).

By the early 1980s the trend of heavy borrowing and inefficiency reached crisis levels, with many countries facing huge debts and rapid inflation (Corbo, 2000). Lenders cut back on loans to the region, cutting off desperately needed funds. ISI had reached its exhaustion stage. It was obvious that import substitution development was unsustainable and that major restructuring was needed.

ISI was the dominant development theory in Latin American through much of the second half of the 20\textsuperscript{th} century. Its original goal of using the state to protect local industries expanded significantly, and the government’s role grew to include ownership of industry, large bureaucracies, and numerous agencies designed to control and administer human and physical development. After
initial growth, ISI proved unsustainable and was replaced by a new development theory—neoliberalism—as a means of expanding regional growth. As will be shown later in this chapter, the policies of ISI resulted in a specific type of urban morphology. In recent years this morphology has been modified by neoliberalism, which is reshaping the Latin American city in the 21st century.

2. Neoliberalism in Latin America.

At the beginning of the 1980s, economies included price controls, a highly protected trade regime, multiple exchange rates, distorted credit allocation, and restrictive labor processes. By the end of the 1980s, a change had been made toward inflation stabilization, fiscal reform, trade and financial liberalization, and privatization. This shift has come to be referred to as neoliberalism.

The essential elements of neoliberal reforms were to move economic policies away from heavy state influence toward stable and open market systems (Corbo, 2000). State interventionist policies, such as those of ISI, were seen as interfering with the efficient allocation of resources and inhibiting economic growth (David, 1997). The concept of a “minimal state,” which would ensure individual rights and produce only those goods that are collective in nature, replaced that of statist ISI policies. While the state was used as a catalyst for industrial and economic growth under ISI, neoliberal policies focus on the private sector, free trade and specialization (Skarstein, 1997).
One of the first goals of restructuring was to reduce rampant inflation and government deficits (Corbo, 2000). The sale of inefficient public enterprises and reduction of subsidies cut government spending. Newly privatized companies were forced to compete in a market economy. This was intended to improve the efficiency of resource allocation. Likewise, competition was encouraged by trade reform. Tariffs and other trade barriers were dramatically reduced so that companies competed on a worldwide basis. Privatization was also promoted in the financial sector, through the selling-off of state owned banks and the lifting of restrictions on interest rates. While reducing government spending and promoting competition, governments also sought to increase revenues through tax reforms, such as the creation of value added taxes and imposition of personal income taxes. Finally, restructuring included reforms in labor policy, although to a much lesser extent. Wage flexibility, limits on dismissal payments, and reductions in mandatory social security taxes have been introduced in many countries.

Neoliberal reforms accomplished goals of stabilizing macroeconomic trends through lower inflation and higher economic growth. Yet, while economic growth has improved, it has only improved moderately. Growth rates varied between 5.3% and 0.3% during the 1990s, insufficient for pulling the region out of its underdeveloped status (ECLAC, 1997).

With inflation under control and, in some cases, higher rates of economic growth, many countries moved into a second stage of reforms during the 1990s
(Birdsall, et al., 1998). These reforms are intended to build on progress from the first stage of changes by expanding economic benefits to poorer segments of the population. Throughout the region, public social spending increased during the 1990s (ECLAC, 1997). This occurred largely in areas of "human capital," such as education and health care.

Neoliberal practices currently dominate economic policy in Latin America and their long-term effectiveness is unknown. One impact that can be seen right now, however, is on urban morphology. The following section will discuss these impacts in more detail.

D. Urban Morphology.

The key question this project addresses is whether neoliberal reforms affect sociospatial segregation differently than ISI. This section will examine the literature, some well developed and some not, that attempts to explain the complex causal relationships between state policies and urban morphology, specifically as it relates to sociospatial segregation.

Two schools of thought are useful in examining sociospatial form and how it may change in response to economic policy—ecological models of urban form and neoclassical economic geography.
1. Ecological Models.

A number of ecological models have grown out of the work of Burgess (1925), Hoyt (1939), and Harris and Ullman (1945). These early models identified distinct zones in North American cities, which varied by social class and land use, and the social and economic processes that created these patterns. Several decades later this approach was used to analyze Latin American cities. One of the most widely cited models was developed by Griffin and Ford (1980) (Figure 2.1). They present a model that describes the Latin American city as a series of concentric rings emanating from a downtown business district. Immediately surrounding the downtown business district are middle income residences. This includes large mansions, frequently built around the beginning of the twentieth century, which have since been subdivided into multiple-unit middle class homes. It also includes smaller homes, both professionally-built and owner-built. This area is considered desirable due to its proximity to downtown employment and shopping, and the presence of full urban services, such as water, electricity, sewers, etc. Just beyond this ring is an area of mixed middle and lower income residents. Homes in this part of the city vary in quality and there are ample signs of construction. Few, if any, homes are built by professional contractors. Rather, residents construct their own homes through self-help. As families grow and money is saved, people add to their homes. Urban services are not uniformly available. With time, these neighborhoods
become fully integrated into the fabric of the city. Homes gradually reach a state of completion and urban services become uniformly distributed.

Figure. 2.1 Griffin and Ford (1980). Latin American Urban Structure.

An outer ring consists of low-income squatter settlements. Homes are constructed of any available material, including scrap metal, wood, and plastic. These areas typically have few or no urban services at the time of settlement. Water is brought in by truck, electricity may be pirated, and roads are unpaved.

Finally, emanating from the city center and cutting through each of these socioeconomic rings, is an elite residential and commercial wedge. This area
consists of older affluent neighborhoods close to the city center, with newer elite homes following an up-scale commercial boulevard.

A more complex model is presented by Bahr and Mertins (1982) (Figure 2.2). Their model emphasizes wedges and isolated islands of residential growth, as well as industrial land use. As in the Griffin and Ford model, the upper classes move away from the center city in an outwardly expanding wedge. Also, the middle and upper-middle classes act as a buffer surrounding the elite residential wedge. As the elite leave the city center, low and middle class residents move into subdivided homes. Government subsidized housing is located in scattered sites throughout the city. At the same time, low and lower-middle class communities form alongside wedges of industrial land use. Squatter settlements develop as “islands” on the edge of the city, but also on undeveloped land within the city.

Arreola and Curtis (1993) offer a more recent model and incorporate the latest changes in urban morphology (Figure 2.3). Although their model represents Mexican border cities specifically, it demonstrates patterns common throughout Latin America. Upper, middle, and lower class housing is organized in a pattern that is similar to previously discussed models with several significant exceptions. Toward the periphery are newer upper and middle-income suburban developments and new regional shopping centers. Furthermore, new public housing is located on the periphery near industrial parks.
Figure 2.2. Bahr and Mertins (1982) Latin American Urban Structure.

Figure 2.3. Arreola and Curtis (1993) Latin American Urban Structure.
Most recently, Ford (1996) has developed an updated version of the 1980 Griffin and Ford model (Figure 2.4). In his model the original structure remains, with several key changes. Looking at the center of the city, he adds a marketplace in the CBD and a small zone of gentrification in the zone of maturity. Further from the center he adds a suburban shopping mall at the end of the elite commercial spine, middle class residential tracts on the outer periphery adjacent to the elite residential sector, and an industrial park on the outskirts of town.

**Figure 2.4. Ford (1996) Latin American Urban Structure.**
Figure from Rubenstein (2002)
While these models are very general, they illustrate important characteristics of the Latin American city. First, population growth leads to additional settlement on the outer edges of the city, creating an ongoing expansion of the city. Second, in contrast to North American cities, poor people generally live on the outer edges of cities while more affluent residents live closer to the city center. This has implications for unequal access to jobs, health care, schools, and other services. Third, recent models demonstrate changing patterns of the city. Recent growth of middle and upper class housing, as well as employment and shopping centers, are changing the suburban periphery.

However, these models are also limited in explaining current forces that are shaping Latin American cities. The most commonly cited models of Griffin and Ford (1980) and Bahr and Mertins (1982) were developed when Latin America was dominated by ISI. As this paper will show, neoliberal policies should affect urban form in very distinct ways. For example, how does urban form change when import taxes on automobiles are dramatically reduced under neoliberal policies? What are the impacts of infrastructure privatization? What happens when low income housing provision is privatized and when land markets are liberalized? All of these should affect how Latin American cities develop, yet the ecological models are not suited to explain these changes. The more recent models of Arreola and Curtis (1993) and Ford (1996) provide static pictures of some recent changes, such as outlying suburban development and
shopping malls, yet they do not explain the processes that are causing these changes.


Neoclassical economic geography is better suited toward explaining what should happen to urban form as Latin American shifted from ISI to neoliberalism. Much of this body of thought is based on the ideas of von Thünen (Fellmann et al., 2001). He proposed a model of land use based on distance from a central market and transportation costs. His work focussed on agricultural land uses and showed that the location of a particular crop is based on the relationship between the cost of production and the cost of delivery to a central market. Different crops are located in a circular pattern around the central market based on where their net incomes will be maximized. Changes in crop type occur at the location where the value of the product delivered to market favors one crop over another.

Alonso (1964) used the same approach to study location and land use in urban areas. His work builds on that of von Thünen by looking at the price that people bid for land at each distance from the city center compared to the asking price at each distance. People or businesses that need better (ie. closer) access to the center are willing to bid higher rents for central locations. Likewise, those for whom access is not as important will bid lower rents for central locations. The occupation of land by each person or business occurs at the location where
the bid price matches the asking price. Of particular significance to this project, Alonso looks at the bid-rent curves for residential land use. A combination of the price of land at a given distance from the city center, a person's income, the cost of transportation to the center, and the price of all other living expenses determine residential land use. Where a person lives is determined by minimizing the costs associated with these factors, while still achieving a certain level of residential satisfaction.

Neoclassical models are much better suited to examining changing economic and social conditions than the ecological models. While the ecological models are useful illustrations of land use for a specific time period, neoclassical models can be adapted to changes in particular variables. Hanink (1997), for example, provides a diagram that shows how changes in transportation costs and market demand affect the location of an agricultural crop (Figure. 2.5). Line $LR_1$ represents the location rent in an initial state of equilibrium. Point $K_1$ represents the crop's maximum distance from the market center. A reduction in transportation costs results in line $LR_2$, with a maximum distance of $K_2$. This indicates a spatial expansion of the crop. Line $LR_3$ represents a decline in market demand for a crop (and thus profitability). Point $K_3$ shows a resulting shift closer toward the market and a decline in the area under cultivation. Changes in residential land use variables can be examined in the same manner as those in figure 2.5, which can be used to hypothesize how economic change in Latin America may affect urban form.
In the following sections ecological models and neoclassical bid-rent curves will be used to show how urban form should change between ISI and neoliberal policies. With this theoretical basis, later chapters will focus on the spatial impacts of policy changes in Chile, and specifically the urban area of La Serena –Coquimbo.

E. “Amenity” Areas in Latin American Cities.

Before beginning the discussion on economic policy change and urban morphology, it is necessary to explain how Latin Americans view urban amenities. The elite largely determine residential land use patterns. They have the economic resources to out-bid lower income groups for the most desirable land, while lower income groups are forced to occupy land that is left over (Portes and Walton, 1976). This has a significant impact on urban morphology and can help to explain why upper income groups dominate the center in early
Latin American urban models, yet are increasingly moving to more suburban areas, as seen in recent urban models.

Butterworth and Chance (1981) point out that Iberians valued dense, compact urban centers to a much greater degree than Northern Europeans. For Spaniards, the "civilized life" took place in town and therefore the rich dominated central urban locations. This tradition was carried over to Latin American cities. Urban development in Latin America was highly regulated by the Laws of the Indies (Griffin and Ford, 1983), which mandated such things as a central plaza, checkerboard street pattern, and the placement of the church, government buildings, and housing (Butterworth and Chance, 1981). In these pre-industrial Latin American cities, economic activity was secondary to administrative and religious functions. There were few incompatible land uses (such as industry or slaughterhouses) in the center and proximity to the plaza was considered a strong amenity.

As Latin American cities became oriented more toward industry and commerce, the central city changed (Griffin and Ford, 1983). Downtown became more crowded, and incompatible land uses, such as industry, developed in core urban areas. The elite moved outward in a newly developing upper class "spine," away from the central city. The city remained compact relative to North American cities, but the new upper class spine began to take on characteristics of North American suburbs. For example, new parks, golf courses, racetracks, and
professionally built housing dominated this area. This was the beginning of a shift in what part of the city was considered to have the greatest amenities.

With the shift in elite residential location came a shift in cultural attitudes. Gilbert (1998) states that Latin Americans increasingly have been influenced by the internationalization of consumer tastes. Many now desire to live in North American style suburbs, with heavy reliance on the automobile, suburban supermarkets, and shopping malls. As in North American cities, the urban core of Latin American is now considered by many to be too crowded, dirty, and dangerous—generally undesirable—when compared to new residential and commercial zones in more suburban locations. The Latin American cultural tradition of “being someplace” can now take place in suburban shopping malls rather than downtown.

The concept of urban amenities gradually changed during the 20th century, from a focus on the center to a focus on more peripheral suburban locations. As the remainder of this chapter will show, policies under ISI prevented most Latin Americans from achieving the newly desired suburban lifestyle. As Griffin and Ford (1983) state, such things as limited urban services and mortgage money restricted suburban-style development to the elite spine. Neoliberalism, as will be shown, has enhanced both the supply and demand for suburban development. A larger segment of the upper and middle classes can now pursue their desires to live in suburban locations. This is significantly
altering the urban morphology and sociospatial segregation of Latin American cities.

F. Income Inequality and Sociospatial Segregation.

An important link between state policies and socioeconomic segregation is related to the degree of income inequality in a society. This relationship is best illustrated by the typology created by Van der Wusten and Musterd (1998), which shows how spatial segregation increases along with income inequality (Figure. 2.6). When there is more income inequality in a country, the wealthy have greater resources to develop communities spatially segregated from the poor. When there is less income inequality, all members of society have more equal opportunities to purchase or rent housing throughout the city. Thus, there are lower levels of segregation in more equal societies. Badcock (1997) also argues that countries with greater income inequality have higher levels of spatial segregation. For example, Britain, Canada, and Australia have less income polarization and less spatial polarization than the United States, while Germany, Holland, and Sweden have still less income and spatial polarization.
The typology presented above is based on more developed countries, not less developed countries or more specifically, Latin America. There is significantly less research specifically on sociospatial segregation in Latin America, although many authors list it as a regional concern (Gilbert, 1994). Latin America has always had high levels of income inequality and sociospatial segregation—placing it toward the upper right corner of the typology presented above. This can be seen in ecological models, such as that of Griffin and Ford (1980), which clearly illustrate distinct zones based on social class.

Neoclassical economic models also show that sociospatial segregation should increase with greater income polarization. Papageorgiou (1990), expanding on the ideas of Alonso (1964), describes the spatial effect of income differences. According to his argument, if the income of a single group
increases, they will be able to bid higher rents for land. This expands the territory under the group’s control. Based on this argument, it can be said that when a single income group outbids other income groups and gains a larger “ring” of the city, segregation increases. A larger “ring” means that more people will live away from boundaries with other income groups, therefore increasing sociospatial segregation.

With a likely relationship between income inequality and sociospatial segregation established, the question becomes, does ISI or neoliberalism produce greater inequality? ISI was intended to reduce income inequality and improve the lives of the poor in several ways. First, ISI would promote internal economic growth by reducing dependency on the “core” industrialized countries. This growth would cause an increase in overall employment, therefore bringing more people into the formal wage economy (David, 1997). Second, the industrial focus of ISI would improve per capita productivity as people moved from backward agricultural sectors to modern industrial sectors (Urrutia, 1991). Economic growth and structural changes in the economy were seen as extremely important means of improving the welfare of Latin Americans.

The state’s role in regulating and directing economic development under ISI also provided an ideological justification for redistributive social policies. The theory of ISI focussed on imperfect competition, conditions of market failure, and other problems with unregulated capitalism, which provided a strong case for centralized state coordination (Meier, 1994). Numerous government
programs were seen as useful in ameliorating high levels of income polarization. French-Davis (1976) shows how wage policies, social security benefits, discriminatory pricing strategies, and progressive tax policies were used to redistribute wealth to lower segments of the population. Improved access to health and education—or the development of human capital—were also seen as important means of improving income distributions under ISI (Urrutia, 1991).

Critics of ISI argued that the protection of industries, discrimination against exports, and regulated price systems would ultimately prove unsustainable (Viner, 1953). This, in turn, would negatively impact the poor and exacerbate income inequality.

As will be shown in later chapters, both arguments have some truth to them. The proportion of the population living in poverty fell through the 1960s and 1970s in response to rapid industrialization under ISI. Likewise, income inequality fell during this time period (Londoño and Székely, 1997), and the middle and lower middle classes increased their relative size (Ahmad, 1978). However, ISI also proved unsustainable, which led to a shift toward neoliberal economic policies during the 1980s.

As with ISI, neoliberal policies present a mixed picture in relation to income inequality. Van der Wusten and Musterd (1998) argue that welfare states (such as those under ISI) push cities toward the lower left corner of their typology, while neoliberal restructuring pushes cities toward the upper right corner of the diagram (Figure. 2.6). Welfare states, they argue, provide larger
and more widespread entitlements, which help to reduce income inequalities and therefore spatial segregation. Free markets, or neoliberal policies, on the other hand, reduce these entitlements, allowing income inequalities and segregation to increase. Badcock (1997) also places his analysis in the context of state policies, arguing that countries with high levels of income and spatial polarization are also more oriented toward neoliberal policies.

Research on inequality shows a complex relationship between neoliberal economic policy and unequal income distributions. The most basic element of neoliberalism is that countries compete in a world market based on their comparative advantage. Many argue that this orientation widens the difference between low and high-skilled urban workers (Sassen, 1991; Berg and Taylor, 2000). Income polarization grows as middle-income jobs are lost to both upper and lower income positions. In addition to changing employment structures, neoliberalism frequently increases unemployment, which also contributes to income inequality. Low skilled workers in industries that face foreign competition are laid off or receive lower wages in an attempt to make production more efficient. Furthermore, a developing country’s comparative advantage frequently lies in the export of primary goods. This makes countries susceptible to worldwide economic fluctuations and external economic shocks. When world prices for a country’s primary export fall, recession and economic instability are likely to follow. These shocks are an important variable in explaining income inequality (IADB, 1998). While the affluent can weather this instability through
diversified investments and high demand skills, the poor frequently face unemployment and inflation. Negative impacts on the poor are further exacerbated by neoliberal cuts in social programs, such as welfare entitlements. These processes have strong negative impacts on income distribution. One study that traces change in earnings inequality in 65 countries over the past 30 years, for example, shows that developing countries almost always face greater inequality after enacting neoliberal reforms (Galbraith et al., 1998).

Advocates of neoliberal reforms argue that their goal is to increase economic growth and that growth has an equalizing effect on income distribution. If there is greater inequality initially, it will decrease with time. This will happen as more and more workers move from low paying traditional sectors of the economy to higher paying modern sectors. Some empirical evidence shows that there is a relationship between per capita income and income inequality on a worldwide basis (IADB, 1998), although others say the evidence is inconclusive and the relationship can go any which way (Ferreira, 1999; Morduch, 2000).

By regressing GDP by Gini coefficients for the entire world, studies have predicted how much inequality Latin America should have for its level of development. For any given level of development, Latin America has between 10% (IADB, 1998) and 25% (Londoño and Székely, 1997) "excess" inequality than the world average. This means that growth does not reduce inequality at the
same rate throughout the world and is not necessarily a reliable means of redistributing wealth.

As the relationship between economic growth and reduced inequality is uncertain, so is the relationship between neoliberal reforms and economic growth. A study of nine developing and post-socialist countries that enacted neoliberal reforms in the past 10 to 15 years shows that economic growth has been limited (Berg and Taylor, 2000). A longitudinal study of key economic indicators shows that only two of the nine countries had positive economic effects as a result of reforms. At the same time, the two countries had “unfavorable” social impacts, including increasing unemployment, underemployment, or wage inequality.

As this section demonstrates, there has been disagreement on whether ISI or neoliberalism better improves income distributions. From a theoretical and empirical standpoint both can improve income distributions, yet both have critics as well. Later chapters will examine the specific situation of Latin American income distribution, both under ISI and neoliberalism.

G. Transportation and Sociospatial Segregation.

Transportation is extremely influential in shaping urban areas. As transportation has evolved during the past 200 years, so has the form of urban areas. Adams (1970), discussing North American cities, shows how urban form changed along with four transportation-related eras. Cities at the turn of the 19th
century were dominated by walking and horsecars. These were replaced by electric streetcars around the turn of the 20th century. Between 1920 and 1945 the recreational automobile era took hold, which transformed to the freeway era after this time period. Urban form before the automobile era remained relatively compact, with development limited to central cities and radial extensions within walking distance to streetcar lines. The automobile allowed rapid urban expansion by providing a large proportion of the population with individual freedom in where to live and work. This freedom, in turn, led to large suburban communities of socially homogeneous income groups (Muller, 1986). By the late 20th century North American cities were dominated by suburban housing and “edge cities”—massive new suburban commercial and retail centers that often have more demographic and economic clout than old central business districts (Garreau, 1991).

Latin American cities have not followed the same pattern of transportation-land use development as in North America. First, the region is much less economically developed. This has meant fewer state resources for developing public transportation and road construction. A lower income population has also meant that people have less money to purchase transportation, be it bus fare or private automobiles (Hilling, 1996). Therefore the Latin American city has remained more compact, with less suburban development and “edge cities” than in North America—although this is gradually changing.
Ecological models show how transportation has affected urban development in recent decades. The Griffin and Ford model (1980) describes how the central business district had grown along a major boulevard (the spine) by the 1970s. Since roadway construction funds were limited, there tended to be a limited number of major boulevards, which were dominated by upper income commercial and residential land uses. Outside of the spine, however, public transportation focussed on the center city, which was still the dominant center of activity at this time. The majority of the population, who relied on public transportation, wanted to live close to the center, thus the Griffin and Ford model describes a general decline in income from middle class to poor as one moves further from the city center. Only the affluent lived along the extended spine, where they could work and shop with little contact with lower income groups. Only a small percentage of the population could afford private automobiles at this time, limiting non-squatter peripheral development to a relatively small number of upper income households at the outer limits of the spine.

More recent ecological models describe changes in urban form and transportation. For example, Arreola and Curtis (1993) show middle class suburban developments and regional shopping centers along highways in Mexican border cities. Ford (1996) also shows middle class suburbs and shopping malls near the traditional spine on the outer edges of Latin American cities. It can be argued that these changes are creating more communities of
socially homogenous income groups, such as those that developed in North America with the spread of the automobile.

Ecological models do not explain why we see different patterns between those developed in the 1970s, when Latin America was dominated by ISI, and those developed in the 1990s, when neoliberalism dominated economic policy. Once again, we can use the ideas of Alonso (1964) to illustrate how changes in transportation have affected urban form. But first we need to discuss how transportation changed between ISI and neoliberalism.

One of the key elements of neoliberalism is to encourage free trade. This means that import tariffs must be reduced or eliminated. Under ISI tariffs could be extremely high. For example, the maximum tariff in Chile in 1973 was 220% (Muñoz, 1992). Tariffs affected a wide range in imported consumer goods, including automobiles. Tariffs were meant to protect nascent domestic industries, which could not produce as cheaply or efficiently as advanced foreign producers. In 1963-64 there were 22 auto assembly plants in Chile, which produced less than 8,000 vehicles per year (Ahmad, 1978). Of these 8,000 vehicles there were more than 27 makes to chose from. The low level of production and wide range of makes meant that production costs and spare parts were very expensive. There was no economy of scale to increase efficiency and lower prices. Therefore, domestically produced cars were out of reach of the majority of the population. Imported autos were also too expensive due to tariffs. When tariffs increased the price of an imported automobile to more than twice
that in the United States, it is no surprise that few Latin Americans owned automobiles. As the Griffin and Ford model shows, few automobiles meant that the city remained compact, with only a small proportion of the population able to live further from the central business district along the spine. Other peripheral residents were the poor who could not afford more central locations.

Under neoliberalism tariffs have been eliminated. The standard tariff in Chile was reduced to 10%, which dramatically lowered the cost of automobiles (Muñoz, 1992). Lower automobile costs mean that a larger percentage of the population can afford at least one car per household. This has caused a surge in the number of upper and middle class households with cars and been an important factor in the demand for North American-style suburban tract homes, as illustrated in the Arreola and Curtis (1993), and Ford (1996) models.

New peripheral urban growth as a result of lower automobile costs can be explained with bid-rent curves (Alonso, 1964). As stated earlier, transportation cost is a key variable in explaining how far one lives from the city center. Given a fixed income, one must balance the cost of rent with the cost of transportation. Moving from the central city, rent declines but transportation costs increase. Neoliberal reductions in automobile tariffs dramatically reduced transportation costs, allowing upper and middle-income groups to live further from the city center (Figure 2.7). When environmental quality increases with distance from the center city, people will chose more peripheral locations (Papageorgiou, 1990). Griffin and Ford (1980) point out that even in the 1970s the upper classes

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were moving further from the city center in order to escape congestion and live closer to peripheral parks, golf-courses, and race tracks. With lower transportation costs, larger proportions of even the middle class could move to the suburbs. Amenities and space are attracting Latin Americans to suburban locations, just as North Americans several decades prior. Lower automobile costs resulting from neoliberal policies are allowing them to achieve this.

**Figure 2.7. Transportation Costs and Distance from Center.**

The lower middle class and poor face a different situation under neoliberalism. Traditionally under ISI, mass transit was publicly owned and/or received heavy subsidies for riders, thus keeping prices relatively low (Ward, 1990). Even if commutes for the peripheral poor were long, they were generally not expensive. Under neoliberalism public transport has been privatized and/or faced reduced subsidies. Higher fares significantly disadvantage low-income groups, especially considering that they tend to live in peripheral locations. Based on economic theory, the poor will move closer the center in order to offset
transportation costs (Figure. 2.7). If central locations are too expensive, the poor have the choice of overcrowding in housing closer to the center or spending a large percentage of their income on transportation to the center.

Changes in transportation under neoliberalism may lead to increased sociospatial segregation. As in North America, the upper and middle classes are increasingly choosing peripheral suburban locations as more household purchase private automobiles. These new communities are larger and more socially homogenous than in older parts of the city. Furthermore, they are more physically separated from lower income groups. Suburban offices and shopping malls are growing in response to suburbanization. The poor, on the other hand, face higher transportation costs as public transportation is privatized or subsidies are reduced and fares increase. This forces them to crowd into more expensive yet more central housing, or spend more on transportation to work in the center or upper income suburban shopping and office centers.

H. Infrastructure and Sociospatial Segregation.

Suburban development and resulting sociospatial segregation are not only limited by transportation, but also by infrastructure. Without access to such services as water, electricity, and sewer connections, new automobile oriented suburbs are either impossible to build or so expensive that only the most affluent can afford them. Strong economic growth and affluence facilitated urban expansion over long distances in the United States, yet this has been absent in
Latin America (Griffin and Ford, 1980). As with transportation, infrastructure has been limited by lower levels of economic growth and lower average incomes in Latin America. Governments had limited resources to build and maintain infrastructure and only a small portion of the population could afford privately built services away from the city center.

Referring to ecological models once again, we can see the resulting urban patterns caused by limited infrastructure. Griffin and Ford (1980) explicitly state that limited infrastructure impacted urban development through the 1970s. Extension of the central business district and upper income housing along a single spine is directly attributed to the state’s limited ability to extend services through multiple sectors of the city. Other ecological models fail to discuss the role of infrastructure on urban form, but its effect can be clearly seen. The Bahr and Mertins (1983) model shows restricted urban growth, with limited wedge-like expansion of upper income residences along major boulevards. Peripheral growth consists almost exclusively of illegal or semi-legal squatter settlements—areas typically without urban infrastructure. Later models, such as Arreola and Curtis (1993) and Ford (1996), once again, show middle-class subdivisions, but without explicit reference to the influence of infrastructure.

Again, we must ask why there are changes in urban form between early urban models developed under ISI, and later models developed under neoliberalism. Under ISI, the state generally owned or heavily regulated water, electricity, and sewerage companies. A lack of state resources, limits on user
rates, and a lack of competition-induced efficiency meant that the quantity and quality of these services was limited (Alfaro, 1998). As part of the neoliberal strategy, many of these companies were privatized or deregulated. This allowed companies to charge users the market rate for services, spurred efficiency and facilitated improvements in infrastructure quantity and quality. The efficiency brought about by neoliberalism meant that infrastructure could more easily reach peripheral parts of the city. For example, when privatization of electricity began in 1988 in Santiago, Chile 29.4% of the poorest income decile had no electricity. By 1998 only 7% had no electricity (Estache et al., 2000). Similar declines occurred for other income deciles as well, so that electrical coverage reached 97% of households (Alexander and Estache, 1999). Likewise, infrastructure privatization in Buenos Aires allowed for 642,00 new water hookups and 342,000 new sewer connections between 1993 and 1995 (Alexander and Estache, 1999). Increased coverage of urban infrastructure meant that suburban development, which as stated above is frequently very homogenous, could expand. For the first time, widespread middle class suburbs could join upper class developments further from the city center.

Classical economic geography is well suited to illustrate how infrastructure affects urban form. An important element in the bid-rent equation is land price (Alonso, 1964). If privatization decreases the cost of infrastructure development, then fully serviced peripheral land can be developed. Using the assumption that people will seek open space and other amenities away from the
central city (Griffin and Ford, 1980; Papageorgiou, 1990) their bid-rent curve will flatten, with lower bids toward the center and higher bids toward the periphery (as in Figure. 2.7). This will have the same effect of increasing suburban development and resultant sociospatial segregation discussed in the previous section.

I. Land Use/Land Markets and Sociospatial Segregation.

Classical economic geography and ecological urban models assume a relatively free functioning land market. Segregated land use patterns, such as where different social classes live, are explained primarily as organic processes that result from individuals attempting to maximize accessibility and residential satisfaction given their ability to pay for land. But, in reality, land markets are not totally free. State policies can directly and indirectly affect land development and urban structure, which may run counter to economically rational land uses.

In the United States, zoning has been an important means of controlling where particular land uses can locate. Zoning codes delineate areas by single family housing, multiple family housing, commercial, industrial, and other land uses. It can also set urban boundaries, beyond which no development is allowed during a fixed time period.

Zoning affects land markets by directing speculative investment to particular parts of the city and away from others. For instance, a residential community near the city center of a North American city may be re-zoned as
commercial. Commercial land use has the potential to provide owners with greater rent than residential land use. Thus, investors speculatively purchase the newly zoned commercial land with the intention of developing it to a more profitable commercial use. This drives up the cost of land in centrally located urban areas. At the same time, land that cannot be used for urban development, such as agriculturally zoned land on the periphery, will not attract speculative investment and will remain cheaper.

Under ISI, state regulation of markets was ideologically justified. This translated to land markets as well, so that in the 1950s and 1960s, governments began to establish zoning and land use plans in an attempt to control and regulate rapidly expanding urban areas (Violich, 1987). As a whole, these regulations had minimal effect. Governments had few resources to enforce regulations, and political connections and corruption severely hampered implementation.

Although zoning controls in general had limited effectiveness, they likely caused some impacts on urban form. For example, an urban limit around Santiago, Chile contained urban growth until a neoliberal oriented military government eliminated it (Portes, 1989). Other government regulations also worked to limit urban growth. The ejido system in Mexico, although developed before ISI, limited urban expansion by prohibiting urban development on ejidal lands.

Limits on urban expansion such as these affect urban form and the use of space by different social classes. First, limits on urban expansion increase the
demand for land in the center. An increase in population will result in higher land prices due to an increase in demand (Alonso, 1964). If urban expansion is restricted, the demand for land in the existing urban areas will be even greater. High demands fuel land speculation, which will focus on legally buildable parts of the city. Combined with limits in transportation and infrastructure, speculation focuses on the center and spine as seen in the Griffin and Ford (1980) model. Low-income groups are not able to afford central locations and are forced to the periphery.

Surging urban populations forced holes in urban limits, with varying results based on social class. Ward (1990) states that in Mexico City the rich were able to use power and money to convert ejidal lands to upper class peripheral developments. At the same time, the poor illegally squatted on ejidal lands. In general, these two groups settled different parts of the periphery, with the affluent following the “spine” in one direction and the poor locating on the other side of the city. The middle class, who did not have power to convert ejidal land and was unwilling to illegally squat, remained in traditional residential sectors of the city. Cities with zoned urban limits likely saw the same effects.

Illegal settlement of non-buildable land also affects urban development due to problems with land tenure (Brandão and Feder, 1995). Residents who lack title to their land are less likely to invest in home and community improvements. This prevents or slows urban consolidation on the periphery.
Again, investment will focus on central parts of the city, where land is legally owned, thus driving up central land prices.

Neoliberalism encourages free land markets, reduced regulation, and private property rights. Thus, zoning and regulations that limit urban boundaries, land tenure, and resulting patterns of speculation are quite different under neoliberalism. With a focus on free land markets, cities are able to expand based on market demand. Combined with improved transportation and infrastructure, and a desire for more space and less congestion means that suburban development can accelerate, leading to changes noted by Arreola and Curtis (1993) and Ford (1996). If there is a demand for peripheral suburban development, the state will not impede its development.

Land tenure also becomes more secure under neoliberalism. With a focus on private property rights, landowners can sell land as they feel fit. Thus, peripheral poor can negotiate legal purchase of land rather than illegally “take” it. This allows expansion of the city as well, although typically poor neighborhoods expand in the opposite direction from upper class neighborhoods.

Urban expansion affects land speculation. With an increased demand for peripheral land there will be a relative decreased in demand for central land. This will cause flattening of the bid-rent curve.

Land use controls and resulting lack of land tenure on the periphery under ISI focused speculation toward the center of Latin American cities, which can be seen graphically as a steep bid-rent curve. This partially explains the patterns
seen in early ecological models, with generally declining social class as one moves away from the center. Neoliberalism shifts investment and speculation more toward the periphery by allowing increased suburban development by upper and middle classes and more rapid consolidation by the peripheral poor.

J. Housing and Sociospatial Segregation.

Housing policy has also changed dramatically in Latin America as countries have switched from ISI to neoliberalism. This too, affects where different social classes live in urban areas. Referring to the ecological models, again we can see differences in where different groups live. Models developed under ISI show a more compact form, with generally decreasing incomes away from the center, and a wedge-like outward extension of upper income housing. Those developed under neoliberalism show greater suburban development by the middle and upper classes.

Under ISI the state influenced housing development in two ways. The first affected private housing development through mortgage and interest rate policies. The second related to direct state development of low and moderate-income housing. Through the 1970s, professional housing development was extremely restricted by limited mortgage money and high interest rates (Griffin and Ford, 1980). This meant that the rich were the primary consumers of professionally built private housing. The rest of the population relied much more heavily on “accretion” whereby houses slowly grew as residents added rooms
over time. The middle classes lived closer to the city center in fully accreted houses while lower classes lived further out in less developed communities.

Other formally built housing consisted of state developed public housing projects. This frequently consisted of large multi-story residential buildings that were occupied by low to middle income workers (Violich, 1987; Herzog, 1989). State built housing was of relatively high quality and more centrally located than peripheral low-income settlements, but limited state budgets prevented development of sufficient quantity.

Housing policy in Latin America created spatially segregated zones under ISI, but as will be shown, not to the same degree as under neoliberalism. The general zones seen in the Griffin and Ford (1980) model are not clearly separated. The accretion process resulted in some mix of social classes. As families improved their social situation, they typically improved their house on site rather than move to a new neighborhood that reflected their improved economic situation. Thus, a single city block could have people with a range of incomes-- some who had become upwardly mobile and others who had not. This is the direct result of policies that prevented the development of formally built housing. Accreting neighborhoods contain housing of varying size, quality, and price, which results in a more integrated and diverse population.

State-built public housing also decreased socioeconomic segregation. With public housing built closer to the city center, low-income residents frequently had better access than if they did not live in public housing. Site
location of public housing under ISI was less dependent on land value and market forces than under more free-market types of policies.

Housing policy under neoliberalism has spurred the development of private-sector professionally built housing, which has resulted in greater suburban development seen in recent ecological models. Under neoliberal policies, states have privatized banking and financial institutions (Corbo, 2000). This has resulted in greater mortgage finance lending and lower interest rates. This allows the middle class to participate in the formal housing finance market, which has stimulated the demand for new housing. Demand has also been stimulated through the provision of targeted housing subsidies for lower income groups (Burgess et al., 1997). Greater access to credit and targeted subsidies allows a much larger segment of the population to purchase professionally built housing than under ISI.

Housing supply increases under neoliberalism as well. The state under neoliberalism is less involved in the direct development of low-income housing (Burgess et al., 1997). Instead of running large, frequently inefficient housing agencies, the state uses competitive bidding processes to contract private sector builders to find land and build houses. Housing supply also increases as more land becomes available for development. As discussed in previous sections, deregulation of infrastructure provision and fewer land use controls open up large areas for urban development.
The results of this contribute to expansion of the city, suburban development, and increased sociospatial segregation. Land markets determine who can afford to purchase housing, and where. The rich continue to live in elite professionally built sectors in high amenity areas, although along with changes discussed previously, these sectors can be located further out. The greatest changes occur in middle and lower income groups. The middle class, with more easily available long-term loans, can purchase housing in new suburban subdivisions. Rather than add to housing in older mixed-income parts of the city, the middle class can buy a completed house in a homogenous middle class suburban neighborhood. Low-income housing, also subject to free-market land prices, is developed in peripheral locations as well, although generally away from high-amenity upper and middle-class sectors. Referring once again to neoclassical land use theory, an increase in the demand for and supply of suburban housing results in a less sloped bid-rent curve.

K. Conclusion.

This chapter has shown how a dramatic re-direction of economic policy may affect urban form and sociospatial segregation in Latin America. From the 1950s through the 1970s, the policy of import substitution industrialization dominated economic thinking throughout the region. This policy justified state participation in many segments of economic and urban development. During the 1980s, Latin America faced serious economic problems and a new development
strategy took hold. Neoliberalism saw the state as an agent that inhibited growth and prosperity. It sought to reduce state influence in economic and urban policy and replace it with the free-market.

Changes in urban form can be seen in ecological models developed under different economic policies. Models developed under ISI, such as Griffin and Ford (1980) and Bahr and Mertins (1982) differ from those developed under neoliberalism, such as Arreola and Curtis (1993) and Ford (1996). While these models are useful “snapshots” of urban form, they do not explain why we see differences over time. Neoclassical economic theory, such as that of Alonso (1964), allows us to examine how changes in particular economic and urban policies may result in the changes illustrated in the ecological models.

Between ISI and neoliberalism there have been changes in income inequality, transportation, infrastructure, land use/land markets, and housing. In the context of neoclassical land use theory all of these are likely to lead to urban patterns seen in recent urban models. Vast differences in income mean that different social groups will seek housing in different parts of the city. Those with higher incomes will seek land in more desirable parts of the city, while those with lower incomes are forced to less desirable sectors. Changes in transportation, infrastructure, land use/land market policy, and housing development have all allowed for greater spatial expansion of Latin American cities. Suburban development for the upper and middles classes is following growth further from the traditional center in the direction of culturally defined
high amenity zones, while low-income housing is being built further out toward
low-amenity zones. With increasing demand for land on the periphery, the
traditional city center is seeing falling rents. The elite spine is pulling further
away from the center, possibly along the lines of North American edge cities,
leaving downtown for lower-middle and lower-income residents who are
unwilling or unable to commute from the periphery.

While extension of the spine and segregated social classes were elements
of models developed under ISI, these processes are accelerating under
neoliberalism. Classes are pulling farther apart, living in socially homogenous
suburban zones, similar to those seen in North American cities.

The following chapters will show in more detail how economic reforms
have affected income inequality, transportation, infrastructure, land use/land
markets, and housing in Latin America, and specifically Chile. How these
changes have manifested themselves in the medium size Chilean urban area of
La Serena-Coquimbo will then be examined in greater detail.
Chapter 3

Economic, Social, and Urban Change: Latin America and Chile

A. Introduction.

Chapter two provided a brief description of economic change in Latin America and theoretical explanations as to how these changes should affect urban form and sociospatial segregation. This chapter will discuss how well Latin America in general, and Chile specifically, fit the theories discussed previously. It will provide more detail on changes in income distributions under ISI and neoliberalism, sociospatial segregation, and policy changes as they relate to transportation, infrastructure, land use/markets, and housing. Each section will begin with a description of patterns found in Latin America as a region, followed by a description of patterns found specifically in Chile. This sets the stage for analysis of changing sociospatial segregation in La Serena-Coquimbo.

B. Economic Policy.

A general description of ISI and neoliberalism in Latin America was given in Chapter two. In order to prevent redundancy, this section will only discuss economic policy change in Chile.
1. ISI and Neoliberalism in Chile.

a. Import Substitution Industrialization.

Chile, as most Latin American countries, adopted economic policies of import substitution as a result of rapid decline in world markets during the Great Depression and World War II (Pitts, 1987). During this time a complex system of trade and exchange regulations was established in order to support domestic industrial development. ISI continued through the 1960s, when state investment in industry increased dramatically. State investment in energy, telecommunications, and infrastructure increased, so that by 1970 the state was responsible for 50% of Chilean industrial investment (Collier and Sater, 1996). State involvement in industry also included the copper industry, the nation’s primary export at this time, which was nationalized so that the state owned 51% of mining company’s holdings. In addition, there were agrarian reforms that led to expropriation of large landholdings for redistribution to the rural poor. Economic policy through the late 1960s led to moderate growth rates of 4%, kept inflation from worsening, and increased average wages (Ffrench-Davis, 1999). However, industrial capacity was underutilized and wages were lower than expected for given levels of growth.

In 1970, Chilean economic policy shifted even further toward state intervention under socialist president Allende. Between 1970 and 1973 many of the statist policies of previous decades were augmented. However, concerns about macroeconomic stability were outweighed by attempts to gain additional
political support (Collier and Sater, 1996). As will be shown, along with external interventions, this ultimately led to total economic collapse and a military coup.

Many industries were nationalized during this time through forced sales, state purchase of majority shares, and seizure of unproductive or “essential” industries (Ffrench-Davis, 1999). Additional factories were illegally taken over by militant workers. By 1973, the state controlled 80% of the country’s industrial output and roughly 60% of GNP (Collier and Sater, 1996). Agricultural land was seized, as well, and converted into state-run farms or given to the rural poor.

Overall state spending increased during this time. Funding was increased for health care, housing, education, and other benefits, and state sponsored public works projects were initiated in order to reduce unemployment (Meller, 1996). In order to compensate for inflation, wages were increased through readjustments on a regular basis and numerous price controls were established.

All of these reforms quickly led to severe economic problems. Initially, industrial output increased by 12.1%, GNP grew by 8.0%, and unemployment declined to 3.8% (Meller, 1996). With wage increases and price controls, purchasing power grew dramatically. However, this growth was short lived. It was based largely on utilization of unused industrial capacity and exploitation of existing stocks of raw materials and inventories from previous years. When these ran out, industrial production declined rapidly. This was compounded by
reduced production and investment by privately owned businesses, fearful of state expropriation, and state-run entities, run by political managers.

As production in many segments of the economy fell, the government used foreign reserves to subsidize imports of consumer goods (French-Davis, 1999). Yet declining output meant declining revenues and quickly made it impossible for the government to continue these subsidies. As a result, foreign loans were sought to prop up the economy.

Declining supplies of consumer goods led to increasing inflation (Meller, 1996). Price controls fell apart as the black market replaced official distribution channels. The government attempted to readjust wages to keep up with inflation, which only compounded the problem. With declining industrial, agricultural, and mining output, shortages of food and consumer goods, and rampant inflation, dramatic changes were needed in economic policy. But political support from the working class was deemed more important, at least in the short-run, and chosen over tough economic restraint.

Tough economic restraint came as a result of the military coup in 1973. Chile’s economy had essentially collapsed by this time, discrediting state intervention in the eyes of many Chileans. The military government set out to dismantle statist policies and restructure the economy along free-market, or neoliberal, lines.

Chile’s transition from a highly regulated to a neoliberal economy can be analyzed in two phases (Martínez and Díaz, 1996). The first took place between 1973 and 1983, and was characterized by the dismantling of the old system. It was a foundational period and intended to create a more open and modern economy. The second phase was put into place toward the end of the 1980s. This phase was intended to create new institutions and enhance an export-led economy. The first phase laid a neoliberal foundation while the second was dedicated toward fine-tuning and adjustment.

Given the gravity of economic problems inherited by the military government, initial reforms were geared toward creating stable macroeconomic conditions (Riveros, 1998). These included stabilizing inflation and restoring market allocation of resources. Policies to improve growth rates were intended to follow.

One of the first changes was to privatize or re-privatize state enterprises and agricultural lands (Meller, 1996). In 1974, 257 companies and roughly 3,700 agricultural parcels were returned to their original owners. This process was continued through the early years of reform, so that by 1980 only 45 companies remained under state control. While nearly all state enterprises were privatized during this time, those that remained under state control included the top ten enterprises in the country, such as copper, steel, telephones, energy, and coal (Riveros, 1998).
Privatization was accompanied by cuts in public sector employment and state spending. Between 1974 and 1981, public sector employment was reduced by 30% (Meller, 1996). Public spending was also reduced, falling from 20% of GDP in 1971/72 to 12% in 1981. This soon changed budget deficits to budget surpluses.

Trade and exchange rates were also reformed soon after the coup. A goal of no tariff greater than 60% by 1977 was first established (Ffrench-Davis, 1999). This was gradually reduced, so that by 1979 there was a uniform tariff of only 10% on nearly all imported goods. The exchange rate was also fixed during this time. Chilean currency was devalued against the dollar in an attempt to make exports cheaper. Also, several days after the coup, the majority of price controls were lifted. Whereas prices in all segments of the economy were state regulated in 1973, by 1974 only a handful remained under state control, primarily foods and some public services (Meller, 1996).

Domestic financial markets were restructured as well. Interest rates were deregulated in 1973 and allowed to change based on market conditions. State operated banks were privatized, and foreign banks and other financial institutions were allowed to provide loans (Martínez and Díaz, 1996).

Capital mobility was liberalized gradually between 1974 and 1981 (Mizala, 1998). Foreign capital was allowed to compete freely with local investors. In 1974 restrictions on foreign borrowing for individuals and companies was lifted, while the same was done for banks several years later. By
1981 all restrictions on short and long term credit were eliminated. This resulted in a sharp increase in foreign debt, so that interest payments and amortization was soon greater than the total value of foreign loans (Martínez and Díaz, 1996). When an international recession struck in the early 1980s, numerous Chilean companies collapsed under heavy debt-load. The state was forced to purchase debt from the banking system and take over many financial institutions in order to prevent total collapse of the financial market.

As this section has illustrated, early reforms put into place by the military government were a dramatic shift from those of previous administrations. Economic policy was transformed from one of state control in nearly all sectors of the economy to one of minimal intervention. This had major impacts on growth, inflation, and unemployment, as well as poverty and income distribution. The “shock” treatment applied to the Chilean economy during this time caused growth rates to fall dramatically by 1975, and then recuperate by 1977. But while growth rates recovered relatively quickly, inflation did not reach single digits until 1981. Furthermore, unemployment rose steadily through the 1970s, reaching a high of 19% in 1976 and falling only to 16% by 1981. In 1982 the regional debt crisis and recession affected Chile by slowing growth and pushing up unemployment rates once again. Inflation and unemployment, combined with limited wage increases, cuts in social spending, and a lack of negotiating ability by the working class, had major impacts on poorer segments of Chilean society. This will be discussed in detail later in the chapter.

Second stage economic reforms were a continuation of neoliberal policies of the late 1970s. This stage was a time of fine-tuning and recovery from the debt crisis of 1981/82. The principal goals were to recover from the recession, first, by eliminating debt and, second, by growing the economy through the export sector.

Debt reduction took several forms. First, the bank bailout shifted debt from the private sector to the state. Fiscal policy was then tightened, with reductions in social spending and cuts in public employment and wages. Public employment fell by a modest 2% but real wages in this sector were reduced by 13% to 17% (Meller, 1996). Social spending in health, education, and housing was reduced by 10% after 1983, with remaining funds being specifically targeted toward the neediest segments of the population. As a result, the fiscal deficit fell from 3.5% of GDP to surpluses by 1987 (Ffrench-Davis, 1999).

Privatization continued through the 1980s, when enterprises such as public utilities (telecommunications and electricity), as well as mining, steel, and food processing were sold (Meller, 1996). Many of these companies had been profitable, yet were sold at half their value. Privatization of profitable state enterprises can only be explained by Chile's neoliberal ideology of reducing intervention whenever possible, even in cases where state industry functioned relatively well.
The export industry expanded, both in its share of GDP and in diversity of products. By 1989, exports accounted for 28.3% of GDP— an increase from 20.7% between 1974 - 1981, and from only 10% between 1971 - 1973 (Ffrench-Davis, 1999). In addition to growing as a percentage of GDP, exports also diversified during the 1980s. In 1971-73, non-copper exports accounted for only 25.6% of all exports. The share of non-copper exports grew steadily during the 1980s, so that by 1989 they represented 54.2% of all exports. Exports diversified to include mining, agriculture, forest and wood products, fish and marine products, and industrial goods (Meller, 1996). The decline of the role of copper in the export economy and the diversification of export goods meant that Chile was less susceptible to external shocks from changes in the international price of a single good. The expanding export sector (combined with high copper prices between 1987 and 1989) increased state revenues and helped reduce fiscal deficits.

Chile’s determination to pay off its debts and maintain economic stability restored international confidence in the country and increased foreign investment (Ffrench-Davis, 1999). In 1987/88 foreign companies invested $95.8 million. This increased to $230 million during 1989/90. This investment also helped reduce deficits and increase economic growth.

The second stage of neoliberal reforms was a continuation of the radical changes of the 1970s, but with an emphasis on expanding economic growth through the export sector. Table 3.1 shows that growth fell dramatically during
1982 - 1983. Through a focus on debt reduction and economic stability, growth increased significantly in 1984, fell somewhat in 1985, and increased steadily until 1989. Inflation was kept in the range of 20% per year, not ideal, but good compared to the early 1970s and relative to other countries in Latin America. The budget was brought under control so that there were surpluses once again by 1987. Thus external debt peaked at about US $20 billion between 1985 - 1987, and began to fall after that.

Table 3.1. Economic Indicators in Chile.

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual growth rate (GDP)</th>
<th>Inflation %</th>
<th>Budget surplus</th>
<th>External debt, millions of US$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1974</td>
<td>1</td>
<td>375.9</td>
<td>-6.8 n.a.</td>
<td>5453</td>
</tr>
<tr>
<td>1975</td>
<td>-13.3</td>
<td>340.7</td>
<td>0</td>
<td>5392</td>
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<td>1976</td>
<td>3.2</td>
<td>174.3</td>
<td>3</td>
<td>5763</td>
</tr>
<tr>
<td>1977</td>
<td>8.3</td>
<td>63.5</td>
<td>0.9</td>
<td>7153</td>
</tr>
<tr>
<td>1978</td>
<td>7.8</td>
<td>30.3</td>
<td>2.2</td>
<td>8790</td>
</tr>
<tr>
<td>1979</td>
<td>7.1</td>
<td>38.9</td>
<td>5.1</td>
<td>11325</td>
</tr>
<tr>
<td>1980</td>
<td>7.7</td>
<td>31.2</td>
<td>5.5</td>
<td>15700</td>
</tr>
<tr>
<td>1981</td>
<td>6.7</td>
<td>9.5</td>
<td>2.9</td>
<td></td>
</tr>
<tr>
<td>1982</td>
<td>-13.4</td>
<td>20.7</td>
<td>-2.3</td>
<td>17263</td>
</tr>
<tr>
<td>1983</td>
<td>-3.5</td>
<td>23.1</td>
<td>-3</td>
<td>18133</td>
</tr>
<tr>
<td>1984</td>
<td>6.1</td>
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<td>-3.5</td>
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</tr>
<tr>
<td>1985</td>
<td>3.5</td>
<td>26.4</td>
<td>-3.7</td>
<td>20607</td>
</tr>
<tr>
<td>1986</td>
<td>5.6</td>
<td>17.4</td>
<td>-1</td>
<td>20898</td>
</tr>
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<td>6.6</td>
<td>21.5</td>
<td>2.4</td>
<td>20722</td>
</tr>
<tr>
<td>1988</td>
<td>7.3</td>
<td>12.7</td>
<td>4.2</td>
<td>19012</td>
</tr>
<tr>
<td>1989</td>
<td>10.2</td>
<td>21.4</td>
<td>4.9</td>
<td>17569</td>
</tr>
<tr>
<td>1990</td>
<td>3</td>
<td>27.3</td>
<td>3.4 n.a.</td>
<td></td>
</tr>
<tr>
<td>1991</td>
<td>6.1</td>
<td>18.7</td>
<td>2.2 n.a.</td>
<td></td>
</tr>
<tr>
<td>1992</td>
<td>10.3</td>
<td>12.7</td>
<td>2 n.a.</td>
<td></td>
</tr>
<tr>
<td>1993</td>
<td>6</td>
<td>12.2 n.a.</td>
<td>n.a.</td>
<td></td>
</tr>
</tbody>
</table>

Mizala, 1998. Table 6.2
Ffrench-Davis, 1999. Table 6.1
d. The 1990s: Neoliberalism with a Human Face.

Economic policy pursued by democratically elected governments in the 1990s has not changed fundamentally from the military period (Riveros, 1998). The same basic strategies of macroeconomic stability—lowering inflation, fiscal balance, and free trade—resulted in relatively strong growth during this time. For example, between 1989 and 1998, growth in GDP averaged more than 7% (Ffrench-Davis, 1999). This was accompanied by falling inflation rates, which were 27.3% in 1990 and 8.2% in 1995, and only moderate unemployment, which fluctuated between 5.5 and 6.5% (Solimano, 1999). Growth was fueled by an expanding export sector, key to the neoliberal philosophy, which diversified and grew at a faster rate than GDP (Ffrench-Davis, 1999).

While the essential tenets of neoliberalism went unchanged, there was a shift toward greater social concern during the 1990s. In relation to social policy, the Chilean government states that... “In difference to that which occurred predominately in the decade of the 1980s, this strategy has affirmed the necessity of active State responsibility in the material of social development, in that the principal social challenges can not be resolved only by actions of the market and temporary palliatives” (MIDEPLAN, 1999, p.43). Rates of poverty and inequality were still high at the end of the 1980s and the democratic governments realized that political support could only be maintained by including a greater proportion of the population in the benefits of economic growth. The stable
economy and economic growth begun in the 1980s allowed for increases in social spending through the 1990s. Social spending was increased significantly in areas of pensions, education, housing, health, and other programs between 1989 and 1998 (MIDEPLAN, 1999). Furthermore, the minimum wage was increased, helping a significant proportion of the population at the lowest end of the socioeconomic spectrum (Ffrench-Davis, 1999). Increased social spending and a higher minimum wage caused major reductions in poverty during the 1990s. For example, in 1990, 38.6% of the population lived in poverty, but by 1998 only 21.7% were poor (MIDEPLAN, 1999)\(^1\). As will be discussed in the following section, income distributions have not changed significantly, indicating that growth is lifting all socioeconomic groups at the same rate, without disproportionately helping the poor.

Moving into the 21st century, neoliberalism with social concern continues to define Chile's economic policy. The current president, Ricardo Lagos, based his election campaign on the slogan “Growth with Equality.” As through the 1990s, basic neoliberal economic policies are being pursued, but with a larger state role in ensuring that low-income groups do not get left behind by free market capitalism.

\(^1\) The Chilean government has been using the same poverty classification system since 1987. For urban households, the poverty line is based on 2 times the values of a basic food basket (MIDEPLAN, 2001).
C. Income Distribution and Poverty.

The reviews of economic reform in Latin America (Chapter 2) and Chile (this chapter) show how dramatic changes have occurred in the region’s approach to growing economies. In Chapter 2 we saw that there is disagreement amongst experts as to which development strategy improves the lives of Latin American residents most—ISI or neoliberalism. From a theoretical and empirical perspective, supporters of each approach argue that their way is better. The following section will present the historical evidence on how income distributions and poverty have changed in Latin America in the later half of the twentieth century. This will be followed by a look at patterns in Chile. This analysis will show how social conditions have changed under ISI and neoliberalism, which will lead into a discussion of the relationship between changing income distributions and sociospatial segregation, as posited in Chapter 2.

1. Distribution Patterns in Latin America.

Latin American has been a region of high income-inequality since the Spanish and Portuguese first established their political and economic systems in the New World. The conquest was designed to extract wealth from new territories in the Americas, not create a new civilization. A large base of indigenous people was exploited in mining and agricultural activities, while a small group of colonial overseers retained tight control over political and
economic power (Sheahan and Iglesias, 1998). When high death rates reduced
the indigenous population, African slaves were imported to perform the same
functions. Differences between a small economic and political elite and a large
population of rural poor laid the groundwork for continued inequality. The poor
had no access to land or education and remained subject to a few wealthy
colonial leaders who did.

In the first half of the twentieth century, Latin America was still largely
agricultural. Ownership of land and political power continued to be highly
concentrated, with roughly 90% of the region’s agricultural land held in 9.5% of
the landholdings in 1950 (Sheahan and Iglesias, 1998, 43). By mid-century,
manufacturing in urban centers was expanding. At the same time populations
were increasing in rural areas. The lack of agricultural work in the countryside
and the possibility of industrial work in cities drove people to urban areas. Yet
rural to urban migration vastly outpaced job creation in the industrial sector.
Competition for jobs kept wages low and inequality was therefore maintained in
urban areas as well.

Regular measurement of income distributions date to only 1960 (Sheahan
and Iglesias, 1998). Comparisons between the 1960s and 1990s for various
regions of the world indicate that Latin America is the most highly unequal in the
world (Table 3.2) (Sheahan and Iglesias, 1998, p. 31).²

² The Gini coefficient is a common measurement of inequality. A zero represents a perfectly
equal distribution while one represents complete concentration in one individual or household.
Table 3.2. Regional Indexes of Inequality: 1960s-1990s (Gini scores)

<table>
<thead>
<tr>
<th>Region or Group</th>
<th>1960s</th>
<th>1970s</th>
<th>1980s</th>
<th>1990s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Latin America/Caribbean</td>
<td>0.532</td>
<td>0.491</td>
<td>0.498</td>
<td>0.493</td>
</tr>
<tr>
<td>Sub-Saharan Africa</td>
<td>0.499</td>
<td>0.482</td>
<td>0.435</td>
<td>0.47</td>
</tr>
<tr>
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<td>0.319</td>
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</tr>
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<td>Eastern Europe</td>
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<td>0.246</td>
<td>0.25</td>
<td>0.289</td>
</tr>
</tbody>
</table>

These figures are useful indicators, but care must be taken in making regional comparisons over time. Which countries are, or are not, included in a particular year can influence results. Likewise, the year a survey was taken can influence results as annual variations can be large. Nevertheless, the consistency of regional rankings indicate that Latin America is the most unequal in the world. The magnitude of inequality is most dramatic when examining income differences between the poorest 1% and the richest 1% (Londoño and Székely, 1997). In 1970 (using 1985 dollars) the poorest segment of the population earned an average of $112 while the richest earned $40,711. This represents an income ratio of 363. By 1995 the difference had grown to $159 and $66,363, with an income ratio of 417.
Average Gini scores by decade mask more detailed trends within decades. Londoño and Székely (1997) conducted a detailed analysis of inequality and poverty in Latin America from 1970 to 1995. Their research shows a “U” pattern when Gini scores are plotted by year during this time period (Fig. 3.1).

**Figure 3.1. Gini Score by Year.**

During the 1970s, economic growth and macroeconomic stability led to more equality in the region. Gini scores dropped by roughly 5 points between 1970 and 1982. Table 3.3 (Londoño and Székely, 1997, p.10) shows that improved equality was due primarily to gains by the poor and middle classes at the expense of the richest 20%. These patterns are consistent with import substitution policies, which sought to grow economies in a more equitable manner.
Table 3.3 Income Distribution 1970 to 1995.

<table>
<thead>
<tr>
<th></th>
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<td>10.1</td>
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<tr>
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<td>1.7</td>
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<td>2.8</td>
<td>2.6</td>
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<td>11.8</td>
<td>-6.3</td>
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<td>3.5</td>
<td>3.8</td>
<td>3.5</td>
<td>3.5</td>
<td>9</td>
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</tr>
<tr>
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<td>4.9</td>
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<td>6.2</td>
<td>5.4</td>
<td>-4.8</td>
<td>3.9</td>
</tr>
<tr>
<td>VII</td>
<td>7.7</td>
<td>8.5</td>
<td>7.7</td>
<td>8</td>
<td>10.3</td>
<td>-9.3</td>
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</tr>
<tr>
<td>VIII</td>
<td>10.9</td>
<td>11.6</td>
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<td>11.1</td>
<td>6.5</td>
<td>-8.8</td>
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<tr>
<td>IX</td>
<td>17</td>
<td>16.9</td>
<td>15.4</td>
<td>15.9</td>
<td>-0.9</td>
<td>-8.5</td>
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<tr>
<td>X</td>
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<td>46.8</td>
<td>45.4</td>
<td>-6.4</td>
<td>10.6</td>
<td>-3</td>
</tr>
</tbody>
</table>

While growth policies of the 1970s improved income distributions, they were based largely on international loans. When the debt crisis struck the region in 1982, all gains were lost. By 1990 the region’s Gini reached a high of 58.3. During this time all segments of the population except for the richest 10% lost income share. The richest segment of the population was better able to ride out the crisis by diversifying investments and having skills that allowed them to seek employment in less affected segments of the economy.
During the 1990s the region again saw economic growth and macroeconomic stability. Yet, unlike the 1970s, there has been no improvement in income inequality. Székely and Hilgert (1999, p.4) point out that by 1998 “there is no country in Latin America where we can confidently say that income inequality improved...” Their research on inequality in the 1990s shows that Gini coefficients rose in 8 countries and remained statistically unchanged in 7 countries. This lack of improvement is significant in that rates of inequality were very high in 1990. Table 3.3 shows that between 1990 and 1995 the richest decile lost 3% of their share of the wealth. However the poorest decile lost 14.6% and the second poorest decile lost 3.6%. It must be noted that despite some loss by the top decile, it still receives 45.4% of income. Deciles 3 through 9 have made progress, gaining shares of the regional income. Thus the relative difference between the top and bottom income groups has increased while there were some gains for the middle class.

2. Patterns of Poverty in Latin America.

Figure 3.2 and Table 3.3 show that poverty has followed the same general patterns as inequality since 1970. Rates of moderate poverty fell significantly during the 1970s, from 43.6% in 1970 to 27.5% in 1982. Extreme poverty fell as well, from nearly 20% in 1970 to a low of 10.2% in 1981. This was due to high economic growth rates and improvement in income distribution. Not only were fewer people classified as poor during this time, but those who remained poor
saw incomes rise to become closer to the poverty line. This can be seen by declines in the Poverty Gap index.\footnote{The poverty gap is the average shortfall of the income of the poor with respect to the poverty line, multiplied by the head count ratio.}

**Figure 3.2. Poverty Rates 1970-1995.**

The economic crisis of the 1980s led to greater poverty and, in fact, Latin America was the only region of the world where poverty increased during this decade. By the end of the decade, moderate poverty had reached 35.2% and extreme poverty had risen to 17.4%. As would be expected, the Poverty Gap increased as well, with those classified as poor falling even further below the poverty line.

Through the 1990s, despite economic growth and stability, poverty rates have failed to fall significantly and have remained around 33%. This is due primarily to high levels of inequality. As indicated above, Latin America has
substantial "excess" inequality for its level of economic development. This translates into "excess" poverty as well. In 1970 there was 39% more poverty in the region than would be expected based on world averages. This rose to 50.3% in 1995, which indicates that economic growth is not successfully improving the lives of the poor. Latin America is the most unequal region in the world and therefore has abnormally high levels of poverty for its level of development. If Latin America had income distributions equal to Eastern Europe or South Asia, poverty would be reduced to a mere 3%. This would be the lowest in any developing region of the world.

Economic policy is closely tied to income distributions and rates of poverty. Through the 1970s import substitution industrialization led to moderate economic growth and improved social conditions. Poverty rates fell and income inequality was reduced, although each of these remained excessively high. By the end of the 1970s, ISI proved to be a non-sustainable development model and Latin American fell into a major debt-related crisis.

Neoliberal reforms in the 1980s were enacted as a means of restructuring economies and establishing stable, sustainable growth. These reforms have been successful in controlling inflation and increasing economic growth but have been less successful in improving the lives of the poor. Inequality and poverty rose in the early 1980s as a result of the debt crisis and the shift to neoliberalism. Inequality and poverty rates have stabilized since the 1980s yet remain very high. In the 1990s there have been promising changes in social spending, especially in
human capital, yet spending is still too low to offer adequate quality and coverage to all segments of the population. Gains should be made in poverty reduction and income distribution in future decades, but the extent of these gains may be insufficient, or too late, to prevent social and political discontent.

3. Income Distribution Patterns in Chile.

Neoliberal reforms began in the mid-1970s in Chile, much earlier than in the rest of Latin America. In order to provide a complete picture of changes in income distributions between ISI and neoliberalism, good data from at least the 1960s are necessary, however quality data are unavailable from this time period (Londoño and Székely, 1997). Ffrench-Davis (1999) states that income distributions improved between 1964 and 1970 as a result of economic growth and industrial investment induced by the government, although no solid data is given to confirm this assertion. In contrast, Riveros (1998) presents data for Santiago showing steadily increasing inequality between 1960 and 1970. A possible explanation for these differing trends may be that the Riveros data is for Santiago while Ffrench-Davis discusses Chile as a whole. Rapid urban growth in Santiago during the 1960s may have offset local improvements in job creation and wages, as lower skilled and less educated migrants moved to the capital.

Between 1970 and 1973, the Chilean state was even more active in controlling the economy and redistributing resources. Again using data for Santiago, Riveros (1998) shows roughly a 10% drop in the Gini score between
1970 and 1974. Radical redistribution policies during this time may have offset the negative distribution tendencies of rapid migration of the poor to Santiago. Despite the lack of solid income distribution data for this time, there is a general agreement that inequality fell (Ferreira and Litchfield, 1998).

Neoliberal reforms began in 1973 and have remained the dominant development paradigm in Chile to the present. The “shock treatment” of early reforms had a negative effect on income distributions (Riveros, 1998). There was an increase in Gini scores for Santiago between 1974 and 1976 during the instability of the military coup and initial stage of reforms. A slight improvement occurred between 1976 and 1979, but inequality grew again in the 1980s.

Reliable national data on income distribution are available between 1987 and 1994 (Londoño and Székely, 1997; Ferreira and Litchfield, 1998). During this time there has been no statistically significant change in the level of income inequality (Ferreira and Litchfield, 1998; Székely and Hilgert, 1999). After initial shocks from neoliberal adjustments, Chilean income distributions seem to have stabilized at relatively high levels. This follows the general trends seen for Latin America as a whole. The main difference with Chile is that neoliberal shocks occurred roughly 10 years before the majority of the region.

Chile, based on 1994 national data, ranked among the most highly unequal countries in Latin America, which places it among the most unequal in the world. As an example, the top 10% of the population receives 3 times as
much income as the second decile, and more than 30 times more than the poorest 10% (IADB, 1998). Furthermore, a more detailed examination of income distribution in Chile reveals that income is most highly concentrated in urban areas (IADB, 1998). Chile is a highly urbanized country and, regardless of the sector in which income is earned, the wealthy are found in urban areas. Executives in extractive industries, such as mining and agriculture, as well as executives from industrial and service sectors, work in urban offices. Likewise, the lure of work draws low-income residents from the countryside to urban areas. The presence of upper level executives and rural migrants in urban areas leads to high levels of urban income inequality.

The concentration of wealth in Chile presents interesting social patterns. Income distribution excluding the top 10% of the population is actually lower than any other Latin American country and the United States (IADB, 1998). This means that excluding the super-rich, Chile is a relatively egalitarian society. At the poorest levels of the population, poverty has been dramatically reduced in the 1990s. While in 1990 38.6% of the population was officially poor, and 12.9% indigent, in 1998 only 21.7% were poor and 5.6% indigent (MIDEPLAN, 1999). The reduction of poverty reflects fewer people facing severe problems of obtaining food, shelter, and other basic needs.

Income distribution has remained unequal yet stable during the 1990s. For example, in 1990 the lowest decile received 2.0% of the income while in 1997 they earned 2.01%. The top decile earned 43.8% of the income in 1990 and
42.04% in 1997. A major reduction in poverty during this time period indicates that new growth has not led to a greater concentration of wealth. Concentration of wealth was unchanged, but as the economy expanded, every sector of society received a larger piece of the economic pie. Inequality in Chile is primarily the result of a small super-rich segment. Excluding this group, there is significantly less inequality, with many fewer poor and indigent households than a decade ago. While many families struggle to get by each month, and there is greater economic insecurity due to a weaker social security safety net than in more developed countries, the socioeconomic structure of Chile is much more "middle class" than initial income distribution data indicate.

D. Sociospatial Segregation.

In Chapter 2 we saw that increased income inequality should lead to increased spatial inequality, or sociospatial segregation. This chapter has shown that there have been high levels of inequality in Latin American for most of its history. There were slight decreases in inequality under ISI, however, this system relied heavily on foreign borrowing and, ultimately, proved unsustainable. Inequality increased during the transition period to neoliberalism, and then leveled out in the 1990s. High levels of income inequality, as with the region as a whole, characterize Chile.

Given the paucity of income distribution data under ISI, it is difficult to say with certainty which system leads to greater inequality and it is beyond the
scope of this paper to resolve this issue. It will have to suffice to say that income inequality is high and there are few indications that neoliberal policies will improve distributions in the near future. This has important implications for studying sociospatial segregation. Patterns of segregation seen in early ecological models (Griffin and Ford, 1980; Bahr and Mertins, 1983) as well as recent models (Arreola and Curtis, 1992; Ford, 1996) are heavily influenced by income inequality. Resilient income inequality, when combined with changes brought about by neoliberalism, is an important explanatory variable in understanding the spatial patterns of segregation.

1. Patterns in Latin America.

Exactly how sociospatial segregation has changed over the past two decades is unclear and presents a more complicated picture than the income inequality/segregation typology presented in Chapter 2. This is largely due to a lack of research that looks specifically at sociospatial segregation in Latin American cities.

A 1989 article by Portes and Johns points out that income polarization in Latin America in the 1980s increased spatial polarization in cities such as Santiago. During this time, new upper income sectors of the city were developed where the rich could work and live without having to come into contact with other classes in the central city. At the same time, enforcement of private property rights in Chile meant that squatter settlements were removed from
middle and upper income parts of the city. The combination of increased income polarization and squatter removal significantly increased spatial segregation.

Yet Portes (1989; Portes et al., 1994) has also found examples of decreasing sociospatial segregation along with increasing income polarization. One study found that three out of five cities in the Caribbean Basin experienced greater income inequality and less spatial polarization. The same results were found in Montevideo and Bogotá. These patterns resulted from the middle class moving to lower income neighborhoods in an attempt to save money during hard times and the development of squatter settlement in interstices between affluent neighborhoods in an attempt by the poor to live closer to employment centers. These studies do not clearly state how social classes are defined, which makes conclusions of decreasing sociospatial polarization partly suspect. It seems logical that if the “middle class” is moving to lower income neighborhoods in order to save money, then they may no longer be “middle class.” This group may be “middle class” based on education or occupation, but may have shifted to the “lower class” based on income. Based on an income definition of social class, there would be no mixing of middle and lower income groups. The development of squatter settlements in interstitial areas, however, does support Portes’ general conclusions.

Despite potential weaknesses in Portes’ measurement of class, higher income inequality and decreased segregation has also been found in studies of São Paulo and Rio de Janeiro (de Queiroz and Correa, 1995; Caldeira, 1996).
During the 1990s, peripheral land once used by the poor has become upgraded and occupied by the middle class. Land further out is not an option for the poor, as transportation costs and travel to work times would be prohibitive. Thus, more poor moved back to central city tenements. Likewise, the rich have moved to the periphery in search of isolated enclaves. This mixture of class between the center and periphery has reduced spatial polarization during the 1990s.

These examples show that some Latin American cities do not fit the theoretical models, although others do. Van der Wusten and Musterd (1998) state that it is intriguing to speculate where residuals lie on their typology or why some cities do not fit the models. The presence of squatter settlements in Latin America present a more complicated picture than in cities of more developed countries. Squatters can elect to live in urban interstices close to higher income groups, an uncommon situation in more developed countries. Likewise, some Latin American megacities, such as São Paulo, may reach a size-transportation inequilibrium where the poor can not live any further from job-rich upper income communities due to excessive transportation costs. In this case, they will chose overcrowded centrally located tenements over extremely peripheral locations.

Despite the existence of "residuals," there is a good case that income inequality leads to sociospatial segregation. The presence of squatter settlements in interstitial areas of Latin American cities can reduce segregation, but this phenomenon is limited in scale and to specific countries. The majority of the world's cities probably fit the typology of figure 2.6 quite well. This also should
hold true for the majority of Latin American cities, which have traditionally had extremely high levels of income inequality and spatial segregation.

2. Patterns in Chile.

While little research has looked specifically at sociospatial segregation in Latin America, even less has focussed on Chile. The research on sociospatial segregation in Chile that does exist focuses on Santiago (Gross and Rodríguez, 1988; Portes, 1989; CED, 1990; Ortiz and Schiappacasse, 1998; Ortiz and Schiappacasse 2000). Studies on other Chilean cities have examined land use and urban structure, without a specific analysis of sociospatial segregation (Rebolledo, 1987; Bodini et al., 1987; Olave and Romero, 1998).

The most complete analysis of spatial segregation in Santiago mentions ISI and neoliberalism as important factors in shaping urban processes in the 20th century, yet the authors do not follow through with the analysis (CED, 1990). The relationship between ISI, neoliberalism, and urban form, as noted in the CED study, have stimulated ideas pursued in this dissertation.

The CED study finds that Santiago is highly segregated, resulting in "two" cities—one rich and one poor—that have little interaction. Santiago evolved in a manner similar to that illustrated in the Griffin and Ford (1980) model, with declining social class away from the center city and an elite spine. During the second half of the 20th century the upper class spine grew from the center city to the east. This area received the greatest share of municipal
spending and therefore had better infrastructure and higher quality education, housing, and health care.

Segregation was enhanced between 1979 and 1985 when large numbers of squatters were removed from upper income sectors of the city and relocated to state-sponsored housing in lower income communities (CED, 1990). Further segregation occurred when middle class residents near these newly formed public housing projects relocated to more homogeneously middle class communities.

Several policies are mentioned in the CED paper that implicate neoliberalism in the evolution of Santiago’s segregated urban form, however, little detailed explanation is provided. Income inequality is said to manifest itself spatially, resulting in spatial separation as different groups compete for land. Transportation is also mentioned, where upper-classes in the eastern part of the city rely on private cars while poorer groups rely on slow and costly public transportation. Infrastructure is shown to be unequally distributed between affluent and poor parts of the city as well. Land use/markets and housing policy are also said to affect Santiago’s development. Free land markets and less restricted zoning have led to suburban expansion, peripheral land speculation, and central city decline.

The remainder of this chapter will discuss the issues alluded to in the CED report in more detail. As mentioned in Chapter 2, in addition to income inequality, we can expect transportation, infrastructure, land use/markets, and housing policy to affect urban form. The following sections will examine
changes in these policies in Latin America and Chile under ISI and neoliberalism.

E. Transportation.

1. Patterns in Latin America.

As shown in Chapter 2, transportation has a major impact on urban form and sociospatial segregation. Traditional Latin American urban models argue that cities have been compact, with more desirable land being located close to the center and along an upper-income spine (Griffin and Ford, 1980). One of the forces leading to this form has been limited transportation opportunities. The middle-class has traditionally sought land close to centrally located employment and shopping, since the primary mode of transportation was walking or public transit. Only the rich could afford private automobiles and chose to live further toward the periphery along the upper-income spine. More recent models show homogenous suburban development for not only the upper-class, but middle-classes as well (Arreola and Curtis, 1993; Ford, 1996). This section will show how ISI and neoliberalism have impacted private automobile ownership in Latin America and how this is leading to the urban form described by recent urban models.

Prior to ISI, automobiles had to be imported to Latin America (Jenkins, 1987). High import fees and quotas, along with disrupted trade during World War Two, created a pent up demand for cars. With the end of the war imports
increased dramatically, creating severe trade imbalances in the region (Jenkins, 1987). In the early 1950s, ISI was taking hold as the dominant development strategy in Latin America. In an attempt to end trade deficits partially created by automobile imports, several governments, especially Mexico, Argentina, and Brazil, began to develop domestic auto industries (Kronish and Mericle, 1984). In 1956, Brazil required 90 to 95 percent domestic content in automobiles. Argentina enacted similar regulations in 1959. Mexico, in 1962, required 60 percent domestic content.

The market for automobiles under this system was extremely limited. Domestic companies could not produce enough cars to achieve economies of scale, given small populations and low per capita incomes, thus unit costs were high. For example, production costs in the 1960s in Argentina were 245% those of the US, while Brazil’s were 180%, and Mexico’s 158% (Kronish and Mericle, 1984). Due to import tariffs, imported cars were expensive as well. In Argentina in 1960 and 1961, 100,000 cars were sold for 5 times the price they would have cost in their countries of origin (Jenkins, 1987). Low supplies and high prices for new cars meant that used cars did not depreciate greatly, preventing a filtering down to the middle class. High prices meant that only the upper-classes could afford automobiles, with new car sales confined to roughly the wealthiest 10 percent of the population (Jenkins, 1987; Violich, 1987).

By 1970, local automobile production eliminated the backlog demand for cars, given income distributions and car prices. Those who wanted and could
afford cars had acquired them. Growth rates of automobile usage continued to grow through the 1970s, spreading noticeably beyond the upper-class market (Violich, 1987). This was due to a number of reasons. As the supply of new cars increased, used car prices fell, allowing a filtering of vehicles to some of the middle-class (Jenkins, 1987). Also, consumer credit expanded during this time, allowing longer-term financing for cars. For example, in 1973 sales on credit accounted for 85% of new car sales in Argentina (Jenkins, 1987). Economic growth also led to an increase in car ownership (Faiz, 1995). As described earlier in this chapter, there was moderate yet steady growth in per capita GNP through the 1970s. This growth enabled more people to afford a private automobile. The most dramatic illustration of the influence of economic growth on automobile ownership could be seen in Mexico toward the end of the 1970s, when the petroleum boom fed rapid growth of the automobile industry (Morris, 1998).

By the end of the 1970s and early 1980s, ISI was facing problems. As described earlier, economic growth became increasingly dependent upon foreign loans and inefficiency plagued industrial production. In the realm of automobiles, prices remained high compared to the US and other industrialized countries. For example, a 1978 government report in Argentina found that per unit production costs were twice that found on the world market (Kronish and Mericle, 1984).
During the 1980s, ISI collapsed as economies fell victim to the debt-crisis. Economic collapse affected automobile ownership and growth rates of auto ownership slowed or fell during this time (Table 3.4). While the date of transition to neoliberalism varied throughout the region, most countries saw neoliberalism as a guiding development paradigm by the end of the 1980s. In the automobile industry, state owned vehicle companies were privatized, tariffs and quotas on imports were reduced or eliminated, and production techniques were streamlined (Tuman and Morris, 1998). These changes have led to a reduction in the price of automobiles. For example, in the early 1990s, Argentina car prices fell by 35% from their 1980s prices (Catalano and Novick, 1998). Lower prices have been accompanied by economic growth in the 1990s. Data on car ownership during the early 1990s shows how lower prices and economic growth are once again leading to increases in car ownership throughout the region (Table 3.5). Around the mid-1990s the regional average had reached 55.6 automobiles per 1000 people.

Table 3.4. Automobile Growth 1960s to 1990s.

<table>
<thead>
<tr>
<th>Latin American Private Automobile Growth Per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960-70</td>
</tr>
<tr>
<td>7.5</td>
</tr>
<tr>
<td>1970-80</td>
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<td>8.2</td>
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<td>1980-90</td>
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<tr>
<td>2.3</td>
</tr>
<tr>
<td>1990s*</td>
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<tr>
<td>4.5</td>
</tr>
</tbody>
</table>

Source: Author’s calculations based on 18 Latin American countries. ECLAC Statistical Yearbook; UN Statistical Yearbook, UN Demographic Yearbook.

* 1990s-- calculations up to 1993-1997
Table 3.5. Automobile Ownership 1960s to 1990s

<table>
<thead>
<tr>
<th>Latin American Private</th>
<th>Automobiles/ 1000 people</th>
</tr>
</thead>
<tbody>
<tr>
<td>1960</td>
<td>12.1</td>
</tr>
<tr>
<td>1970</td>
<td>21.1</td>
</tr>
<tr>
<td>1980</td>
<td>38.3</td>
</tr>
<tr>
<td>1990</td>
<td>47.2</td>
</tr>
<tr>
<td>1990s</td>
<td>55.6</td>
</tr>
</tbody>
</table>

Source: Author’s calculations based on 18 Latin American countries. ECLAC Statistical Yearbook, UN Statistical Yearbook, UN Demographic Yearbook.
* 1990s—calculations up to 1993-1997

Lower prices and economic growth mean that a larger percentage of the population can afford to purchase an automobile. This will affect urban form by allowing urban expansion and the development of auto-oriented suburban housing projects for middle and upper-income residents seeking space and relief from urban problems.

2. Patterns in Chile.

Automobile ownership in Chile has followed the same general patterns found throughout the region. Prior to import substitution policies, which begin in the auto industry around 1960, all cars were imported to Chile (Jenkins, 1977). Tariffs of 200% and limited quantities led to much lower rates of ownership than would be expected prior to 1960. Ownership rates by 1960 were 7.6 autos per 1000 people (ECLAC, 1987).

During the 1960s, Chile established local content requirements in an attempt to promote the local automobile industry (Jenkins, 1987). Yet, unlike Argentina, local production was slower to fill latent demand. By 1970 there were
over 18 cars per 1000 people (Statistical Yearbook for Latin America and the Caribbean, 1987). Backlog demand, given incomes and prices, was filled around this time, yet the majority of autos were owned by the most affluent segment of the population (Jenkins, 1977). For example, the richest 5% of the population accounted for over 75% of car expenditures in 1969 and the richest 19% accounted for over 90% of expenditures. Concentration of automobile ownership in the upper income brackets was caused by relatively high prices. Local production was inefficient and high import taxes kept foreign car prices high. During the second half of the 1960s, car prices were 4.2 times higher than in their country of origin (Jenkins, 1977).

In the early 1970s ISI was further enhanced, with local content requirements reaching 70% and import tariffs raised to more than 300% (Jenkins, 1977; Correa, 1994). Neoliberal restructuring began soon after the military coup in 1973. By 1975, tariffs on automobiles were reduced to 115% (Correa, 1994). Further reductions lowered tariffs on small cars to 10% by 1979, which then fluctuated somewhat through the 1980s, and settled at 11% in 1991. Tariffs on large cars also fell, but at a slower rate. By 1986 small and large car tariffs were the same.

Changes in tariffs dramatically altered the number of imports, the retail price of automobiles, and ownership rates. Disruption of the economy due to political turmoil in the early 1970s reduced growth rates in auto ownership, but by the second half of the 1970s rates reached a peak of over 11% per year (Table
3.6). Combined tariffs and taxes on large cars fell from 158% of the car’s value in 1975 to 116% by 1980. With small cars, combined taxes fell to 32% (Table 3.8). Lower tariffs dramatically increased the proportion of imports, which grew from 14.3% in 1975 to 67.2% by 1980 (Correa, 1994). Lower tariffs and taxes established under neoliberal policies allowed a larger segment of the population to purchase cars and the private vehicle stock reached 48 per 1000 people by 1980.

Table 3.6. Growth per year. Number of cars per person.

<table>
<thead>
<tr>
<th>Year</th>
<th>Growth Rate</th>
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<tbody>
<tr>
<td>1960-65</td>
<td>8.73</td>
</tr>
<tr>
<td>1965-70</td>
<td>10.51</td>
</tr>
<tr>
<td>1970-75</td>
<td>6.58</td>
</tr>
<tr>
<td>1975-80</td>
<td>11.07</td>
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<tr>
<td>1980-85</td>
<td>6.67</td>
</tr>
<tr>
<td>1985-90</td>
<td>1.25</td>
</tr>
<tr>
<td>1990-95</td>
<td>7.28</td>
</tr>
<tr>
<td>1995-1999</td>
<td>5.91</td>
</tr>
</tbody>
</table>

Source: INE. Author’s calculations.

Table 3.7. Private cars/1000 people

<table>
<thead>
<tr>
<th>Year</th>
<th>Cars/1000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>48.4</td>
</tr>
<tr>
<td>1990</td>
<td>68.6</td>
</tr>
<tr>
<td>1999</td>
<td>115.7</td>
</tr>
</tbody>
</table>

Source: INE. Author’s calculations.

Table 3.8. Effects of taxes on auto price (%)

<table>
<thead>
<tr>
<th></th>
<th>Large cars</th>
<th>Small cars</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>158</td>
<td>158</td>
</tr>
<tr>
<td>1980</td>
<td>116</td>
<td>32</td>
</tr>
<tr>
<td>1985</td>
<td>112</td>
<td>66</td>
</tr>
<tr>
<td>1990</td>
<td>38.4</td>
<td>35.7</td>
</tr>
</tbody>
</table>

During the 1980s, growth rates slowed due to region-wide economic problems, but the number of automobiles reached 68.6 per 1000 people by the end of the decade (Table 3.7). Taxes as a share of a new car’s price fell dramatically for large cars, falling to 38.4% in 1990. Taxes on small cars fluctuated somewhat, and were 35.7% in 1990. Cuts in tariffs and other taxes caused imports to make up 92.3% of new car sales by 1990 (Correa, 1994).

Economic growth in the 1990s, combined with lower auto prices, has led to renewed growth in the number of cars per 1000 people. Growth has been slowed slightly by new emissions control requirements, which have raised car prices by about US$1000 (1991 US dollars) (Correa, 1994). However, car ownership by 1999 had reached 115.7 per 1000 people (Table 3.7).

Neoliberal policies have increased the number of imported cars in Chile and lowered the price through reduced tariffs and taxes. This has led to an increase in car ownership. While economic crises have interrupted growth, lower prices have certainly led to higher ownership rates than under ISI. Ownership rates of 115.7 cars per 1000 people are similar to rates in the United States in the 1920s (USDOT, 1997). This is when suburban growth rates began to outpace urban growth in US cities, in large part due to increasing automobile ownership (Muller, 1986). Automobile oriented suburbs are becoming increasingly numerous in Chile, indicating that Chilean urban form may be following similar patterns of suburban sprawl and a new emphasis away from the traditional city center.
F. Infrastructure.

1. Patterns in Latin America.

An important element of urban policy relates to the development of urban infrastructure. Infrastructure is closely related to urban form in that it either leads or follows growth. Adequate infrastructure such as water, sewerage, and electricity are typically placed along with or in anticipation of high-end commercial, residential, and industrial sectors of the city. On the low-end, these services frequently follow development of squatter settlements and informal commercial and industrial land uses. Thus, infrastructure has been an integral part of urban form in Latin America. As Latin American countries have switched from ISI to neoliberalism, many of the state companies that traditionally provided urban infrastructure, such as water, electricity, and sewerage, have been converted to private or semi-private companies. This has improved efficiency and, in many cases, allowed greater extension of services. In turn, this is allowing greater spatial expansion of serviced urban areas. Suburbanization by the upper and middle classes, and resultant sociospatial segregation, is facilitated by the expansion of urban infrastructure.

Water systems are arguably the most important element of urban infrastructure and, therefore, act as a useful illustration of how governments have used them in urban development. Without the delivery of potable water and the elimination of sewerage, disease flourishes and urban society is difficult to maintain. Because of this, urban water systems have been an integral part of
Latin American cities since the 19th century. Public water supply has generally been classified as a "basic human right" and governments have made its development a key policy issue (Alfaro et al., 1998).

Water supply, until the era of neoliberalism, was provided by government monopolies. Access to water was geared first toward productive sectors of the city, such as industrial and commercial centers, and upper class residential neighborhoods (Bennett, 1989). Poorer parts of the city were targeted for water infrastructure as well, yet government agencies were unable to keep pace with rapid urban growth. This was due to several causes. Provision of services generally were not self-financing and required state subsidies to operate. In an attempt to make services accessible to the entire population, low and middle-income users paid lower rates for services. These policies frequently meant that state agencies had even less revenue, thus, extension of service to additional low-income communities was impossible (Alfaro, 1998). Furthermore, staffing of state agencies, especially at high levels, was highly politicized and often corrupt (Srinivasan, 2000). Service was frequently intermittent and queues for installation long. Thus, as a whole, state enterprises performed poorly, both in quantity and quality of service.

Many low-income communities on the periphery of the city were left without water service and forced to pay 10 to 20 times more from water truck vendors when compared to piped water (Alfaro, 1998). Limited service and the political nature of state produced water systems meant that low income groups
frequently had to use political pressure and protest to obtain services (Bennett, 1989). This was hardly just and pitted poor community against poor community in the struggle for urban infrastructure.

As in all areas of urban policy, neoliberal reforms have affected the provision of urban infrastructure as well. Noll, et al. (2000), examines six capital cities (four of which are in Latin America) that reformed their water supply systems in the late 1980s and early 1990s. Each of the cities shifted control from the state to the private sector, either through sale, concessions, leases, or service and management contracts. A cost-benefit analysis of four of these cities indicate that privatization was effective. However, the analysis did not look at the impact on low-income groups specifically. Rates increased in all cities yet only Santiago provided targeted subsidies for low-income residents. Also, areal coverage increased, most likely at rates faster than state run enterprises could have provided. Given that low-income residents without any service pay more for water than those with service, it is also likely that the overall impact on the poor was positive.

Greater efficiency brought about by privatization has provided a greater proportion of urban residents with essential infrastructure. As mentioned in Chapter 2, privatization in Buenos Aires allowed for 642,000 new water hookups and 342,000 new sewer hookups between 1993 and 1995 (Alexander and

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4 Buenos Aires, Santiago, Lima, and Conakry, Guinea. There was not enough data for the remaining two cities.
Likewise, privatization of electricity in Santiago improved connection rates of the poor, where 29.4% of the lowest income decile had no connection in 1988 but only 7% had no connection in 1998 (Estache et al., 2000). Infrastructure improves the quality of life for urban residents, yet it may also spur horizontal expansion of the city. Whereas slower and more inefficient state enterprises limited growth by not providing sufficient infrastructure, private enterprises may facilitate growth by keeping up with demand. Urban infrastructure policy is now less of an inhibiting factor in how or where the city grows.

2. Patterns in Chile.

A central element of Chile’s neoliberal reforms was to privatize or reform state industries. This section will provide a sample of these changes, using examples of water supply and electricity, two essential urban services.

In the late 1980s, Chile set out to reform the Santiago Metropolitan Sanitary Works Enterprise (EMOS). Shirley et al. (2000) explain that while EMOS was relatively successful in providing cheap and abundant water to the majority of Santiago’s residents, it faced a significant lack of funds for maintenance and expansion of its network. Nation-wide, water rates covered less than one half of what was needed to finance provision of the service (Serra, 2000). Informal settlements in and around the city did not have water services and were unable to pay the costs of connection, which reached more than
US$1000 (Shirley et al., 2000). In an effort to improve the financial stability of EMOS, and for ideological reasons, the military government set the privatization process in motion. When a more ideologically moderate civilian government replaced the military government in 1989, it was decided not to fully privatize EMOS, but to reform it along the lines of a private concession. It is beyond the scope of this paper to give details on the reform, but the changes included liberalization of tariffs and efficiency incentives, such as profit sharing for managers and staff.

Reforms increased investment in EMOS and allowed the company to expand and maintain its infrastructure (Shirley et al., 2000). By the mid-1990s, water service reached 100 percent of Santiago’s population. This occurred despite a construction boom in the early 1990s and the incorporation of low-income peripheral communities into the EMOS service area. Although water rates did increase after the reforms, subsidies for the poorest 20% of the population offset negative social impacts (Serra, 2000).

The Chilean electrical industry was also privatized toward the end of the 1980s. In 1987 the National Electricity Company (ENDESA), which served the entire country, was privatized and subdivided into smaller power generation and regional distribution firms (Bernstein, 1991; Hachette, 1993). As with water infrastructure, privatization of electricity led to improved efficiency and financially solid companies (Bernstein, 1991). Electricity coverage was also high prior to reforms, with 97.9 percent of the urban population serviced, but
reforms and concomitant increases in efficiency allowed more widespread coverage, with 100 percent of Santiago’s population served by 1991 (Bernstein, 1991). This was accompanied by an 8 percent decline in electricity prices around the same time (Hachette, 1993).

Neoliberal reforms of Chilean infrastructure providers have allowed for full urban services to accompany urban growth. While water and electricity infrastructure was relatively widespread in urban areas prior to reform, changes have allowed more complete coverage, especially in Santiago (the situation of La Serena-Coquimbo will be examined later). Full coverage has accompanied expanding urban areas and facilitated suburban growth.

G. Land use and land markets.

1. Patterns in Latin America.

Rapid urbanization in the second half of the twentieth century prompted governments to look at means of controlling not only the pace of growth cities but also the spatial form of growth. During the 1950s and 1960s, most Latin American governments recognized the need for urban planning as a means of controlling rapidly expanding cities (Violich, 1987). Institutions were formed to develop plans and regulations, most commonly through a Plan Regulador, or Regulatory Plan. The Plan Regulador created general policy for land use and transportation patterns, as well as zoning of land uses. Other regulatory controls included land subdivision laws and environmental controls. Yet, in practice,
urban planning laws and regulations have had a minimal effect of urban land use patterns. Governments had few resources to enforce regulations, and political connections and corruption severely hampered implementation.

What have played a much larger role in shaping urban land use patterns have been market forces. Traditionally, Latin Americans have invested a disproportionate amount of money in real estate (Violich, 1987). This is partially due to cultural traditions that give prestige to landed wealth, but is also tied to economic instability and high rates of inflation. Urban property holds its value much better during times of inflation and is more stable than unpredictable industrial investments.

The lack of effective urban policy means that land speculation dominates land use and development. Rapid urbanization and a highly centralized urban structure led to great increases in central city land values in the 1960s (Violich, 1987). Central city land was, therefore, redeveloped to more profitable land uses and low-income housing was replaced by high-rise office buildings (Roberts, 1992). Low-income groups have been forced to seek housing where land speculation has not taken hold, such as on the outskirts of urban areas, floodplains, and steep hillsides. At the same time, upper-income groups are able to purchase property closer to the city center and in elite residential communities separated from the poor. Land speculation thus leads to socio-spatial segregation (Geisse, 1992). Market forces subsume attempts at zoning and regulating land use.
Land markets are manipulated, intentionally and unintentionally, by a variety of government regulations (Brandão and Feder, 1995). These regulations frequently reduce spatial segregation but can cause other problems for low-income groups. For example, policies that affect land tenure have a major impact on land markets and urban form. Many countries have inadequate administrative and legal frameworks for the registration of title and legal boundaries. This frequently affects low-income residents on urban peripheries, who, due to tenure insecurity, limit investment in their homes. Tenure insecurity also prevents owners from using property as collateral to obtain loans for improvements. The threat of expropriation for government sponsored projects also reduces tenure security. Thus, tenure insecurity slows urban consolidation on the periphery, often preventing low-income groups from developing stable urbanized communities.

Government policies also can prohibit various land transactions (Brandão and Feder, 1995). For example, the ejido system in Mexico for most of the twentieth century prevented sale of certain agricultural lands for private development. The prohibition on the sale of ejido lands on urban peripheries meant that they were either illegally divided and sold, thus causing tenure insecurity, or urban boundaries were artificially limited. With urban areas limited, central city land values increased even more rapidly. This increased pressure on the poor to move, frequently to illegal peripheral settlements. As a solution to dislocation of the poor, many governments enacted rent control.
However, this caused a reduction in housing construction in rent controlled areas and limited maintenance of buildings.

With neoliberal economic reforms, the land market has become even more important in determining land use. First, as we have seen, restructuring has not improved income polarization. High income-polarization has meant that the rich have more money to spend on real estate while the poor have relatively less. This has created inflationary pressure on urban land. Desirable parts of the city have become even more expensive, thus, more exclusive.

Second, neoliberal reforms have meant an ideological shift in urban planning. While, in theory and occasionally in practice, there were limits on where and how land could be developed, neoliberal ideology makes free land markets a policy goal. For example, the Chilean government in 1979 declared that urban land was not a scarce resource and that limits on the land market should be removed (Portes, 1989). This declaration opened 64,000 acres on the outskirts of Santiago for development. As neoliberal reforms spread throughout Latin America, other countries have also opened up land for development as well. For instance, in 1992, Mexico reformed its constitution to allow privatization of ejido lands (Herbert and Pickering, 1997).

A free land market is promoted by the World Bank. A report published by this institution calls for the dismantling of policies that distort land markets and institutional and legal reforms that encourage them (Brandão and Feder, 1995). Policies such as rent control, most zoning, and limits on land transactions
should be eliminated according to this report. Land law should be established that is easy and transparent to the public. Administration should include open land information systems, property registration and enforcement of property rights, accurate land value assessment, and clearly defined expropriation rules.

As can be seen, government policies toward regulating land development and urban spatial form have followed broader economic policy changes. Under ISI, land use regulations focused speculation toward the city center. This resulted in traditional land use patterns of decreasing socioeconomic status away from the center. Free land markets under neoliberalism allow speculation and land development to occur further out in peripheral areas. Middle and upper-class residents can now legally purchase land in peripheral developments. Lower-income groups can more easily gain legal title to peripheral land as well. However, free land markets ensure that upper, middle, and lower-income communities develop in distinct parts of the city. Upper-income groups select the highest amenity and, thus, most expensive areas, while lower-income groups select less desirable and cheaper parts of the city. Through the process of free land markets, sociospatial segregation increases.

2. Patterns in Chile.

The role of land use planning and land markets in Chile changed dramatically during the second half of the twentieth century. Urban planning began to take hold in the early 1950s, when ISI and a more active government
role took hold as the dominant policy ideology (Fadda and Ducci, 1993). Early planning called for the development of Planes Reguladores for all cities with populations over 7,000. Larger metropolitan plans for Santiago, Valparaíso, and Concepción were also begun during this time.

In 1960, the plan for Santiago was completed, which established land uses and circulation for the capital city (Violich, 1987). Also during this time, squatters were relocated to legally developed lots in an attempt to manage and control development of urban areas. Chilean government estimates show that 30,000 families were relocated nationwide between 1959 and 1963 (Fadda and Ducci, 1993).

From the mid-1960s up to the military coup of 1973, two processes began to strongly influence urban development in Chile. First, urban planning became strengthened and consolidated, with more Planes Reguladores developed and stronger technical and administrative planning tools developed (Violich, 1987). This followed the ideological emphasis of ISI and government influence in development. Housing programs that provided sites and services and promoted self-help housing were created for low-income urban residents (Heitmann, 1993). Through these programs, massive urban migration could be controlled and guided in connection with urban planning goals.

However, these programs unleashed the second process that affected urban development during this time—that of land “takings” (Fadda and Ducci, 1993). Site and service programs could not keep up with the demand for low-
income housing in Chile and the government’s support of self-help housing justified the taking of land not included in official programs. Land takings, or the squatting on urban land by the poor, questioned the rights of the state and private property owners to control urban development. State urban planning was ignored as squatters took land in central parts of the city and upper-income communities, thus reducing sociospatial segregation (Fadda and Ducci, 1993). Likewise, private ownership of the land taken was ignored, showing a disregard for land markets. In 1968 there were 8 land takings, which increased to 23 in 1969 and 220 in 1970 (Heitmann, 1993). Although the socialist government of President Allende opposed self-help housing on the grounds that it was further exploitation of the poor (Heitmann, 1993), land takings and self-help construction reached a peak between 1970 and 1973, when more than 400,000 people settled on the periphery of Santiago (Fadda and Ducci, 1993).

The military coup in 1973 shifted urban development toward a neoliberal, or free market, orientation. The official government policy toward land development was one of “flexible planning, with the minimum of state intervention...” which “eliminated restrictions in order to permit the natural growth of urban areas, following market trends...” (Gobierno de Chile, 1990, p.186). In 1974, laws were changed to allow easier subdivision of rural land for urban use (Paredes, 1998). Neoliberal ideology was further incorporated into law under the 1979 Urban Development Policy. This policy stated that urban land was not a scarce resource (Heitmann, 1993). Urban boundaries around Santiago
were eliminated, resulting in a tripling of the potential developable urban area and rapid horizontal growth (Fadda and Ducci, 1993). Furthermore, land use restrictions were reduced so that market forces would determine use based on the highest rents. Private property rights were re-established in relation to land takings, as well, with over 28,000 illegal squatters evicted and relocated in Santiago between 1979 and 1985 (CED, 1990). By 1985, problems associated with rapid urban sprawl and minimally regulated land use led to a slight retreat in neoliberal land policy. That year, a new National Urban Development Policy stated that urban land was a scarce resource and urban planning and land use restriction were given more emphasis than under the 1979 policy (Fadda and Ducci, 1993).

The neoliberal focus of urban development through the 1980s fed processes that led to sociospatial segregation. Land speculation on the periphery of Santiago increased the price of land, as private property owners sought to earn the highest rent possible (Fadda and Ducci, 1993). With peripheral land legally owned by investors and a government determined to protect private property, land takings by the poor became virtually impossible. While some of the poor in the 1960s and early 1970s were able to settle closer to the center and near upper-income communities, they had typically settled on the periphery of the city (ie. the Griffin and Ford model). Neoliberal policies changed these patterns of residential location. The poor could no longer take land in central and upper-income parts of the city. Thus, the periphery became the only choice for
residential location. Yet with land speculation and free-market land prices, the poor were channeled specifically into less desirable southern and western peripheral locations, where private low-income housing was being developed (CED, 1990). Upper and middle-class housing generally was built to the east, where land prices were higher. Segregation, therefore, increased as speculation and free-market land prices distributed people based on their ability to pay for land. The role of government in determining land uses was minimized while the role of market forces was increased during this time.

With the democratically elected government in 1989, there was a renewed shift toward state regulated urban planning (Fadda and Ducci, 1993), although the neoliberal framework established between 1973 and 1988 was kept largely intact. There has been reactivation of the development and updating of Planes Reguladores, allowing the state to control such things as urban limits, zoning, land use, and densities (Municipalidad de La Serena, 2000), but free land markets still determine where housing is built for different social classes. Land takings are no longer a significant part of the urban development process in Chile. In the 1990s, the state had managed to maintain urban planning standards and protect private property rights against illegal settlements. This was accomplished through various low-income housing programs, which are discussed in the following section.

The role of land use planning and land markets has fluctuated during the second half of the 20th century in Chile. During the 1950s and 1960s urban
planning grew, with the state taking a stronger role in regulating how and where land was developed. However, state control became increasingly compromised by illegal land takings in the 1960s and early 1970s. With neoliberal reforms, urban planning took the back seat to private property and free land markets. Squatters were evicted from central and upper-income areas and relocated to the periphery. Speculation in land markets furthered segregation by distributing people by their ability to pay for land. In the 1990s, a more moderate approach was taken, with renewed urban planning set within a neoliberal framework, where residential location by social class is still determined by market forces.

H. Housing.

1. Patterns in Latin America.

The largest single land use in cities is residential, thus, government policies affecting its distribution have a major impact on urban form. Urban areas have seen massive in-migration of low-income residents during the past 50 years. How to manage urban residential land development for hundreds of thousands of low-income immigrants has, therefore, been a critical issue for Latin American governments.

Beginning in the 1950s, as urban areas saw rapid growth, many countries developed low-cost housing programs (Violich, 1987). These programs usually involved the creation of large government housing bureaucracies that directly built large public housing projects. The quality of housing was frequently
materially better than the ever-expanding peripheral squatter settlements, but the relatively high costs meant that quantity was low and that most poor could not afford the units. In many instances, state built housing was aimed at lower-middle income groups and salaried workers, not the most needy segments of the population (Herzog, 1989). An example of state built housing is highly evident in Caracas, where developments of twenty buildings of twenty stories each can be found (Violich, 1987).

During the 1970s, large government housing projects continued to be built, yet it was acknowledged that they were not an adequate solution to burgeoning low-income populations. Peripheral squatter settlements were vastly outpacing the construction of government housing and new policies shifted toward accommodating these developments through various programs (Burgess et al., 1997). Squatter settlements were regularized by granting legal tenure to residents, providing services such as water, electricity, and sewerage, and improving access to mortgage credit. Settlements were also upgraded with building materials provided with government assistance. In addition, urban policy focussed on revitalizing inner city slums, which provided rental housing for new immigrants (Gilbert, 1989).

All of these policies were designed to be affordable to the poor, be cost recoverable for governments, and replicable in large quantities and in various geographic areas (Burgess et al., 1997). By the end of the decade, however, it was evident that the high cost of providing infrastructure at increasing distances,
as well as high service and land costs, made affordability and cost recovery impossible. Likewise, cost ineffectiveness inhibited replicability of these programs.

Affordability problems associated with urban policies of the 1970s were compounded by the debt crisis of the 1980s. Governments were forced to cut spending in all areas, including urban improvement (Portes and Johns, 1989). Policies of servicing new squatter settlements were replaced by policies of upgrading and densifying existing settlements (Burgess et al., 1997). This was accomplished by providing public and private housing finance, the reduction and targeting of subsidies to specific groups, any by participation of the private sector.

These trends, if not labeled at the time, were the beginning of a neoliberal orientation in Latin America. Government was scaled down and individuals and the private sector were increasingly responsible for developing and organizing the city.

Neoliberal trends that began in the 1980s were strengthened in the 1990s. The role of government was to encourage free-market solutions to urban development. This was accomplished through the reduction of constraints on the supply and demand of housing, the encouragement of privatization, further reduction and targeting of subsidies, and deregulation of the economy. The concept of “enablement” was emphasized, where the private sector, formal and informal producers, and popular organizations were enabled to provide services
and develop land and housing (Burgess et al., 1997). Expanded property rights, such as regularisation of squatter settlements and privatization of public housing, stimulated demand in the housing market. Demand was further stimulated by mortgage financing and targeted subsidies, which made cash and credit more readily available to the middle and lower classes. Supply was increased by deregulating land use, assisting in the provision of residential infrastructure, streamlining of development regulations and standards, and stimulation of competition in the building industry.

The shift in emphasis moved from the direct creation of housing and infrastructure to policies that encourage and coordinate development. Burgess et al. (1997) point out that the neoliberal policies of the 1990s involved a shift from “projects” to “programs”. The free market, encouraged by government policies, would create and spatially allocate urban development. Government reforms focussed on improved accounting, planning, parcel mapping, taxation, and administration of agencies, in an attempt to efficiently and fairly guide development by the private sector.

The shift toward a freer housing market, especially when tied with reforms in land markets and infrastructure provision, has affected sociospatial segregation. Higher central city land prices mean that low-income housing has to be built further on the periphery of urban areas. Thus, lower income housing is expanding in low-rise horizontal patterns far from the city center. Upper and middle-income areas are expanding on the periphery as well, but in exclusive
peripheral developments in high-amenity areas. Therefore, the free market sorts people by income to a greater degree than when land markets, infrastructure, and housing are controlled by the state.

2. Patterns in Chile.

The housing industry went through significant changes in Chile during the second half of the twentieth century. Under ISI, the majority of new housing was built by the state and the private construction sector remained small (Fig 3.3). This resulted in low levels of housing construction for many years and an increasing housing deficit. With neoliberalism, the state pulled out of direct housing development, turning it over to the private sector, which was aided by targeted state subsidy programs. Changes in the housing industry between ISI and neoliberalism have altered the amount and location of housing for different social classes, which, in turn, has affected sociospatial segregation.

Up through the 1950s, the private housing sector was extremely limited by Chile’s mortgage finance laws. Interest rates were nominal and did not change to keep pace with inflation (CIEDESS, 1993). This resulted in negative real interest rates, a good thing for borrowers but bad for attracting investment capital. Much of the private housing was built with private pension funds and sold to affiliated workers. However, by the end of the 1950s, low interest rates had caused most private investors and pension funds to pull out of the housing market.
Figure 3.3. Public and Private Housing Units.

With limited private housing construction the state was forced to deal with growing shortages. Some state housing was built for government employees, but the center of housing policy during this time was providing sites and services for the expanding population of squatters (Heitmann, 1993).

Including private and public housing construction between 1953 and 1958, official statistics show that only 1.07 new units were built per 1000 people (Heitmann, 1993). This was about 4.5 times fewer new homes than would have been needed to accommodate population growth and maintain the number of units per 1000 people at 1953 levels.
In 1959 a new housing law created a savings and loan system that allowed interest rates be indexed to inflation (CIEDESS, 1993). This revitalized the private housing sector to some degree, yet the total number of new homes constructed continued to remain low (Fig. 3.3). Homes that were built by the private sector tended to be oriented toward the middle and upper-classes, despite incentives to build for lower income groups included in the 1959 law (Fadda and Ducci, 1993). The state continued to directly build housing and provide sites and services (Heitmann, 1993). A significant proportion of this housing was directed at southern cities affected by a large earthquake in 1960 and squatters in Santiago that were evicted from illegal land takings.

Between 1958 and 1964, 4.0 new housing units were built per 1000 people (Heitmann, 1993). This was a significant increase over previous years, yet housing deficits were still a problem.

In 1964, the Chilean government declared housing a “good of first necessity, to which every family has a right” (Lerda, 1997). During this time there was a housing deficit of 435,000 units and land takings were on the increase as the public and private housing sectors failed to meet growing demands (Violich, 1987). Attempts were made to strengthen the private sector by providing various subsidies to builders of low-income housing and buyers (Lerda, 1997). This maintained private construction at relatively low yet steady rates (Fig 3.3).
By 1970 the public and private sectors had built 228,398 housing units (Heitmann, 1993). This set a record for housing construction yet due to population growth only resulted in 4.6 new units per 1000 people, slightly more than the previous administration.

Between 1970 and 1973 the state’s involvement in housing increased significantly. The housing deficit was estimated to be 593,000 units in 1970 and reducing this by providing housing to low-income groups became a central part of state policy (Lerda, 1997).

The private sector played a small role in housing development during this time, while the state’s role grew. Housing subsidies to consumers and limited tax breaks and credits to private and cooperative builders allowed some private housing to be built (Lerda, 1997). But by far, the greatest amount of housing was built by the state (Fig 3.3). Direct development of housing by the state was seen as the best way to provide housing. An Emergency Plan of 1971 called for roughly 80,000 new units to be built (Lerda, 1997). By year’s end, over 76,000 units had been initiated. In 1972 a goal of over 42,000 was set, of which 48% were initiated.

State housing was meant to assist the large number of squatters settling in and around Santiago during this time. By 1973 there were 400,000 squatters in the Santiago region, most on the periphery of the city but many near upper-income eastern parts of the city as well (Fadda and Ducci, 1993). As a rejection of land markets and in a conscious effort to reduce sociospatial segregation, state
apartment buildings were built on the site of squatter settlements in upper-income sectors (Violich, 1987).

Between 1970 and 1973, 4.8 new housing units were built per 1000 people (Heitmann, 1993). Again, this was an increase over the previous government, but still not enough to eliminate housing deficits.

As can be seen in Figure 3.3, housing was dominated by the state under ISI. The private sector was restricted by tight credit and limited incomes. Budget constraints and rapid population and urban growth meant that state housing could not keep pace with demand. As described in the Griffin and Ford (1980) model, professionally built housing was limited to upper-income groups. The middle classes lived in more central filter-down housing, while the poor relied heavily on illegal land takings. In relation to sociospatial segregation these processes had several effects. First, only upper-income groups purchased housing and developed new communities further from the traditional city center along the elite spine. In the case of Santiago, this was eastward to the comunas of Las Condes and Providencia (CED, 1990). The middle class lived in filter down housing in more central parts of the city, such as the comunas of Santiago, Independencia, Ñuñoa, and Macul. Low-income groups settled primarily in peripheral locations through land takings. However, housing policies under ISI reduced sociospatial segregation in several limited, yet significant ways. Land takings in and near upper-income communities, such as Las Condes, reduced segregation. While some squatters were relocated to peripheral settlements
between 1958 and 1964, others were allowed to stay by later governments. Land takings challenged the concept of land markets, private property, and urban planning, creating a somewhat more integrated urban fabric.

In 1973, ISI came to an abrupt end and was replaced by neoliberal housing policy. This significantly reduced the role of the state in housing provision and replaced it with private sector builders (Fig 3.3). Official housing policy between 1964 and 1973 stated that housing was a right, however, after 1973, the state considered housing “a right that must be earned with one’s own effort” (MINVU, 1975, p.10). As the state reduced it’s role in housing, individuals and the private sector had to increase their role.

During the first few years after 1973 the state was involved primarily in completing housing projects from the previous administration (Lerda, 1997). Thus little new state housing was initiated during this time. Economic disruptions from the previous administration and political unrest had inhibited the private sector construction industry during this time, resulting in limited production from this source as well (MINVU, 1989) (Fig 3.3).

Through the 1970s and mid-1980s, the state enacted housing policies designed to stimulate the demand for private sector housing (MINVU, 1989). This was accomplished through state housing subsidies, liberalized mortgage finance regulations, and state sponsored home savings plans. For low-income segments of the population, which the private sector was less willing to serve, the state contracted with private developers to build housing.
Development of low-income housing was geared toward those in marginal communities and those who were evicted from illegal squatter settlements. The state set up a competitive bidding process, where private construction companies submitted proposals to build low-income housing in compliance with minimum state standards. Private developers sought land and built units, which were then purchased by the state and sold to qualifying low-income families (Lerda, 1997). Low-income families received a subsidy up to 75% of the value of the house, with the remainder paid for through mortgage credits and savings (MINVU, 1989).

Housing for middle-income groups was stimulated through mortgage policy, subsidies, and savings plans. In 1976, reforms in banking and housing policy liberalized mortgage lending regulations (CIEDESS, 1993). This increased funds available to consumers and stimulated demand for private sector housing. In 1978, the state began issuing housing subsidies to those with moderate incomes (Lerda, 1997). Subsidies varied with the price of the house, the more expensive the house, the lower the subsidy. For example, in 1989 subsidies varied between 37.5% and 5.5% (MINVU, 1989). Finally, in 1985, a home savings plan was established to facilitate savings for down payments.

As shown in Figure 3.3, private housing development increased steadily from 1978 to 1981. The debt crisis and resulting recession slowed housing development in 1982, but was followed by renewed growth through 1989, the end of the military regime. During this time housing construction grew faster
than population growth, resulting in a reduction of the housing deficit (Heitmann, 1993).

This growth impacted sociospatial segregation in several ways. First, as mentioned in the discussion on land markets, many low-income residents were evicted from squatter settlements in and near upper-income communities. Low-income housing contracted by the state tended to be located in peripheral areas, where land values, and thus development costs, were lower (Fadda and Lucci, 1993). A study contracted by the Ministry of Housing and Urban Development (MINVU) in 1985 showed that peripheral land for a hypothetical housing project in Santiago was more than 13 times cheaper than central city land (ODEPLAN, 1985). This meant that a builder would be more likely to build in a peripheral location, where residents had no public services and faced 1 hour commutes to the city center, rather than in a more central location. The purpose of the study was to show that public costs of providing services to peripheral locations were greater than central locations, but these external costs were never incorporated into cost estimates by private builders. Sociospatial segregation also increased as more middle-income groups took advantage of subsidies, loans, and savings plans to buy new housing in exclusively middle-class housing developments.

Through the 1990s the neoliberal orientation of Chile’s housing policy has remained relatively consistent. Figure shows that public sector housing has been essentially non-existent, while private sector construction has grown steadily. Direct contracting of low-income housing, along with subsidies,
savings, and mortgage credits have been effective in stimulating demand for privately build housing (Heitmann, 1993). Between 1990 and 1996, an average of 90,000 housing units per year have been built (MIDEPLAN, 1999). This has reduced housing deficits from roughly 918,000 in 1990 to 746,000 in 1996. Of these units, 50% were occupied by the poorest 40% of the population, with the remainder occupied by higher-income groups (MIDEPLAN, 1998).

The private sector orientation of housing development continues to encourage sociospatial segregation. Low-income housing is built on low cost peripheral land and middle-income housing is expanding in homogenous projects. Land markets determine where different social classes locate. The state fosters housing development through subsidies, mortgage credit, and savings plans, ensuring that increasingly more people from a variety of social classes have access to a home. However, the private sector, acting in response to free land markets, decides where to build housing for different social groups. This leads to increasing sociospatial segregation.

I. Conclusion.

This chapter has shown in greater detail how policy changes between ISI and neoliberalism have affected sociospatial segregation in Latin America and Chile. Strong state influence in economic and urban policy under ISI was replaced by free market policies under neoliberalism. As argued in this paper, there are five key elements of this change that directly affect urban form and
sociospatial segregation—income distributions, transportation, infrastructure, land use/markets, and housing.

Income distributions affect residential location by determining who can afford to live in various parts of the city. When there are great differences in income, the rich can out-bid the poor to a greater extent than if incomes are more equal. Income distributions have been highly polarized throughout Latin America’s history. Polarization declined somewhat during the 1970s under ISI, but then increased in the 1980s due to economic crises and economic restructuring. In the 1990s, distributions have stabilized, but have not declined, as hoped by many economists and politicians.

Transportation also affects urban form differently under ISI and neoliberalism, especially as it relates to private car ownership. Under ISI, limited imports and high tariffs and taxes restricted the number of families that could afford to purchase a car. Under neoliberalism, import restrictions and taxes have been reduced, thus the price of private cars has declined. More families can now afford automobiles and rates of ownership are increasing. This is allowing a larger segment of the middle class to choose homes in new suburban housing developments, along the line of US cities. With upper and middle class families moving to new socially homogenous housing developments, the traditional mix of classes in “accreting” neighborhoods is being lost.

New suburban housing developments are being facilitated by neoliberal privatization and restructuring of public infrastructure companies. Under ISI,
water, sewerage, and electricity were owned and operated by the state. Heavy subsidies and inefficiency limited the state’s ability to expand services to multiple peripheral communities. Instead, urban services were extended along limited upper-income sectors. With privatization, reduced subsidies and increased efficiency have improved the financial situation of infrastructure companies and allowed them to keep pace with growing suburban populations.

Land use/markets play an important role in urban form and sociospatial segregation. Under ISI, the state played a stronger role in attempting to control where and how cities grew. This had limited success, but managed to focus land speculation toward the center of the city. Upper-income residents could afford housing in the central city and along the “elite spine” described in the Griffin and Ford model. Increasingly lower income groups were found as one moved further from the city center and toward cheaper land. With neoliberalism, land use controls have become more limited. More peripheral land is open for legal development, allowing horizontal expansion of the city. The upper and middle class, facilitated by increasing auto ownership, are purchasing housing in high amenity, more expensive suburban locations, while the poor locate in low amenity, low-cost peripheral land.

Finally, housing policy under ISI and neoliberalism has affected sociospatial segregation. With ISI, restricted housing credit meant that only upper-classes could afford professionally built housing. Middle-classes lived in filter-down and fully accreted housing, while the poor lived in squatter
settlements and inner-city tenements. State policies limited sociospatial segregation through public housing projects for middle and lower-income groups, and by tolerating self-help squatter settlements in central locations. With neoliberalism, the private sector dominates housing. Deregulated financial institutions have allowed greater access to mortgage credits, allowing the middle-class to purchase professionally built housing. Low-income housing is generally provided by the private sector and purchased with the aid of state subsidies. Enforcement of private property rights limits self-help squatter settlements, forcing the poor to purchase or rent housing in the formal private housing sector. In connection with free land markets, the private housing sector segregates housing by class. The rich purchase homes in high amenity areas, while the poor purchase home in less desirable parts of the city. The spatial separation between these areas increases due to automobile and infrastructure-lead suburban growth.

The remainder of this paper will examine how income inequality, transportation, infrastructure, land use/markets, and housing policy have affected sociospatial segregation in the urban area of La Serena-Coquimbo, Chile under ISI and neoliberalism.
Chapter 4

The Twin Cities of La Serena-Coquimbo

A. Introduction.

The remainder of this paper will focus specifically on the twin cities of La Serena-Coquimbo. Before moving on to the methodology and empirical analysis of sociospatial segregation, it is useful to provide some background information on the city. This chapter will briefly discuss the history, recent economic growth, and urban form of La Serena-Coquimbo, providing a point of reference for discussion in Chapters 5 and 6.

B. History.

La Serena-Coquimbo is located approximately 300 miles north of Santiago, in the IV Region, Coquimbo. Located on the coast at the southern edge of the Atacama desert, it was founded in the sixteenth century as a supply center for maritime trade between Lima and Santiago and as a means of establishing Spanish control in the region (Véliz C., 1990b). Through the 1700s the city developed as an agriculture, mining, and ranching center. However, inconsistent rainfall of the arid environment limited growth. During the 1800s, improved transportation and communication helped link La Serena-Coquimbo with a slowly developing urban network, and commerce, services, and administrative functions expanded.
By the turn of the twentieth century the city entered a state of decline, as mining deposits in the Coquimbo region were depleted. As a result, people migrated north, where the nitrate industry offered better opportunities for employment. Between 1907 and 1920 the population of the Coquimbo region grew by only .47 percent (Universidad de Chile, 1966). With the collapse of the nitrate market toward the end of the teens, people left the north, some returning to the Coquimbo region and others continuing on to Santiago. Return migration helped increase the rate of growth in the Coquimbo region, which was 1.24 percent between 1920 and 1930. Rates of growth in La Serena-Coquimbo and its region continued to increase until the 1940s. It was during this time that Santiago grew rapidly from industrial investment. As a result of disproportionate investment in Santiago, smaller cities and regions, such as La Serena-Coquimbo, grew more slowly. Between 1940 and 1952, the Coquimbo region grew by only 0.98 percent.

The Chilean government realized that the disproportionate growth of Santiago was unhealthy for the country and introduced policies to decentralize the urban network. Toward the end of the 1940s, the “Plan Serena” was developed, which was intended to increase investment in the urban area of La Serena-Coquimbo as well as surrounding agricultural and mining lands (Vélez C., 1990b). The plan called for changes in the urban design of La Serena-Coquimbo that would beautify the city and make it more efficient and modern. Old streets were to be upgraded and new streets were to be constructed. Plazas and parks
were to be developed throughout the city, along with sports fields and monuments. Public services were also to be expanded, and schools, hotels, worker housing, and apartment buildings were to be built. All new construction was to be built in the Spanish colonial architectural style. Outside of city limits, the plan called for irrigation of agricultural areas to the north and south, rural housing, and an agricultural school. Similarly, industrial zones at the northern and southern ends of the plan area were called for.

The "Plan Serena" rejuvenated the city, which once again began to grow. By 1960 the population of the comunas of La Serena and Coquimbo was 102,850 (Véliz, 1995). This increase was largely due to rural to urban migration, as opportunities in the city outgrew those in the countryside (Universidad de Chile, 1966). This growth represented expanding urbanization in the Coquimbo region. The urban population of the region was 39.3 percent in 1952 and 51.8 percent in 1960. These rates were still lower than the nation's average, which was 65 percent in 1960 and reflected the importance of extractive industries. Even as opportunities expanded in La Serena-Coquimbo, roughly 49 percent of the region's workforce was in either agriculture or mining.

The population of La Serena-Coquimbo continued to grow and by 1970 there were 133,515 people. Gradual expansion of commerce, industry, and agriculture in the region fed the economic growth of La Serena-Coquimbo, so that by 1982, there were 186,721 residents of the city (INE, 1982).
C. Causes of Contemporary Growth.

La Serena-Coquimbo has undergone dramatic changes in the past twenty years. Between 1982 and 1992, La Serena-Coquimbo experienced "explosive growth" (Arenas and Bustos, 1996). By the end of this time period it was ranked as Chile’s 5th largest urban area (Martínez, 1997). Rapid growth continued through the 1990s. The population of the "comunas" of La Serena and Coquimbo has grown from 186,721 in 1982, to 243,582 in 1992, and 322,562 in 2002 (INE, 1982, 1992, 2002). This growth can be attributed to two important forces—an expanding export economy and tourism.

Macroeconomic policies can have a significant spatial impact on urban development. Under ISI, economic development tends to encourage growth of primate cities. Industry requires a critical mass of skilled managers, technicians, and workers, as well as reliable infrastructure. In Latin America, these could only be found in large urban areas—places with universities and focal points of limited infrastructure. As new businesses and industries developed under ISI, they naturally located where essential personnel and infrastructure were. The concentration of economic development in primate cities fed rural-urban migration as people followed employment in search of economic opportunities. However, under policies driven by neoliberalism, many argue that there should be growth in new regions of countries (Uribe-Echevarria, 1996). Neoliberalism’s focus on the export economy should create growth in regions with a comparative advantage in the export market. In Latin America, comparative advantage
traditionally lies in the export of primary goods, such as agriculture, mining, forestry, and fishing. Regional urban centers are hypothesized to benefit from expansion in exports of these products.

Evidence from Chile tends to confirm these expectations. Between 1940 and 1970, that is, under ISI, the average annual population growth rate for Santiago was 39% (Rodriguez Seeger, 1995). Between 1970 and 1992, the period of neoliberalism, annual growth fell to only 7%. While net-migration to Santiago was 213,479 from 1960 to 1970, it had fallen to 113,691 between 1982 and 1992 (Rodriguez Seeger, 1995). This indicates a pattern of slowing growth in Santiago. In addition to a decline in population growth, between 1970 and 1986, Santiago’s share of Gross National Product fell from 48.7% to 43.5% (Riveros, 1992).

Declining growth in Santiago can be attributed to expansion of exports in other regions of Chile. Export oriented neoliberal policies have led to the expansion of mining, fishing, agricultural, and forest production, which favor development in regions outside of Santiago (Soler and Rubio, 1992). Santiago’s loss of 5% of the share of GNP between 1970 and 1986 was due to small gains in 11 of Chile’s 12 regions (the exception being the V Region, Valparaiso) (Riveros, 1992). This indicates that no region saw a dramatic increase in relative economic output under neoliberalism. Rather, regions held their economic position relative to Santiago, preventing further concentration of economic activity in the capital. What makes export oriented neoliberalism unique
compared to ISI is that economic growth lifted all regions at a relatively equal rate, essentially putting a break on Santiago’s ever expanding dominance.

The IV Region, Coquimbo, which includes the urban area of La Serena-Coquimbo, benefited from the neoliberal export economy. The Region’s share of Gross National Product has fluctuated between 2.5% and 2.8% between 1985 and 1997 (Banco Central, 2002a), however, in constant pesos there was a 215% increase during this time (Banco Central, 2002b). This illustrates how economic growth lifted regions of Chile, although their relative share of economic activity was unchanged.

Between 1985 and 1997, above average growth in the IV Region, in constant pesos, was in agriculture, fishing, industry, construction, commerce, transportation, and finance (Table 4.1). Agriculture and fishing are ample natural resources in the IV Region, which gives it a strong comparative advantage in national and world markets. Growth in these areas has led to manufacturing growth. Over 60% of the region’s manufacturing is based on the production of liquor (such as Pisco, from local grapes) and fish processing (MINECON, 2002). Growth in the remaining economic sectors—construction, commerce, transportation, and finance—has developed through the multiplier effect of agriculture, fishing, and industry, as well as tourism.
### Table 4.1. Economic Growth by Sector, 1985 to 1997.

<table>
<thead>
<tr>
<th>% Growth 1985 to 1997 (1986 pesos)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, Cattle, Forestry</td>
<td>272%</td>
</tr>
<tr>
<td>Fishing</td>
<td>575%</td>
</tr>
<tr>
<td>Mining</td>
<td>133%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>249%</td>
</tr>
<tr>
<td>Electricity, Gas, Water</td>
<td>177%</td>
</tr>
<tr>
<td>Construction</td>
<td>355%</td>
</tr>
<tr>
<td>Commerce, Hotels, Restaurants</td>
<td>283%</td>
</tr>
<tr>
<td>Transportation, Communication</td>
<td>319%</td>
</tr>
<tr>
<td>Financial Services</td>
<td>373%</td>
</tr>
<tr>
<td>Real Estate and Housing</td>
<td>128%</td>
</tr>
<tr>
<td>Personal Services</td>
<td>144%</td>
</tr>
<tr>
<td>Public Administration</td>
<td>123%</td>
</tr>
<tr>
<td>GNP</td>
<td>215%</td>
</tr>
</tbody>
</table>

Calculations from Banco Central, 2002

The second major reason for growth in the IV Region is tourism. While tourism may not be directly related to neoliberalism, its impact, specifically on the urban area of La Serena-Coquimbo, has been significant since the early 1990s. Attractions such as beaches, La Serena’s colonial downtown, and scenic inland valleys have contributed to the region’s popularity for Chilean and foreign visitors. Chile’s Economic Ministry reports that tourism grew by roughly 20% per year for much of the 1990s, from an average of 120,000 visitors per year to 360,000 (INE, 1999). The majority of tourists come from Santiago, followed by Argentines (although with Argentina’s recent economic collapse this had probably changed). Tourist development has led to rapid urban expansion in La Serena-Coquimbo, primarily condominium development along the Avenida del
Mar¹. Tourism growth has further driven growth in construction, commerce, and transportation.

Remaining chapters will illustrate how physical growth of the city, as well as the social makeup of the population has changed in recent decades. Specifically, it will show how urban growth under neoliberalism has resulted in increasing sociospatial segregation in La Serena-Coquimbo.

D. Urban Form.

An understanding of the study area's urban form will clarify discussion in later chapters². In general, La Serena-Coquimbo has grown from two core areas—one in each city. Over time, the two core areas have expanded, with northern growth of Coquimbo now connected to southern growth of La Serena. Each city retains its own sense of place (Coquimbo as a working class port city and La Serena as a commercial/ administrative/ tourist city) and each has its own municipal government (the comuna of Coquimbo and comuna of La Serena). However, they are physically and functionally united and must be considered as a single urban area.

The core area of downtown La Serena is the traditional focal point for the northern portion of the conurbation. It contains the central plaza and vast majority of colonial and neo-colonial architecture, as well as the majority of

¹ See Appendix B and C for references to communities and physical features.
² See Appendix B and C.
commercial and government buildings. Mixed within the commercial core are a limited number of residences, while the outer edges of this zone are dominated by residential land use.

Over time, the core of La Serena has expanded. To the north, on the other side of the Elqui River, is Las Compañías, a lower income community dominated by “accreted” and public housing. A similar type of community has evolved in Antena, to the east. In recent years, middle class housing has been developed adjacent to both of these communities.

South of downtown La Serena is where middle and upper class communities evolved. In recent years, these communities have expanded onto farmland to the east, on an ocean view coastal bluff. Additional southern growth follows an auto oriented commercial strip toward Tierras Blancas. While in the past this area was primarily agriculture, with a limited amount of public housing, it is now dominated by middle class housing.

Additional growth in La Serena has occurred along the coastal Avenida del Mar. This zone is physically separated from the rest of La Serena by an agricultural strip of land between the Pan-American Highway and the coast.

Downtown Coquimbo is another busy commercial center. It lies adjacent to a fishing port and, as in downtown La Serena, contains a small amount of housing. A large amount of lower income housing developed early in the “Parte Alta,” northwest of downtown. Much of this area originated as self-help housing on the steep hills surrounding the center. It is now in various stages of accretion.
Lower income public housing can also be found in a band running south and east of downtown (San Juan).

Upper income housing in Coquimbo is concentrated along the bay of La Herradura. This area includes a small private boat harbor, as well as large single family homes and luxury condominiums. Middle class housing in El Llano and Simedpart separates La Herradura from lower-income communities.

Northern growth of Coquimbo has followed major highways. La Cantera consists of commercial and lower income housing on the road heading east to inland valleys. North along the Pan-American Highway are higher income residences, many with ocean views.

The community of Tierras Blancas developed around a large industrial park. Housing is this zone consists of well “accreted” development and public housing.

Growth of La Serena-Coquimbo has resulted in a discontinuous urban area. As will be shown by the following analysis, its urban form can be directly tied to different policies pursued under ISI and neoliberalism. Policy impacts on urban form, in turn, have led to differing patterns of sociospatial segregation.
Chapter 5
Methodology and Data Analysis

A. Introduction.

The first four chapters have established the theoretical basis as to why urban sociospatial segregation is likely to increase in Latin America under neoliberalism. In order to test these ideas, I selected the medium-sized urban area of La Serena-Coquimbo (2002 population-- 322,562 (INE, 2002)) for a case study. This chapter will explain the methodology used to map social class over time. It will also explain how the spatial relationships between social classes and employment and commerce were analyzed. Finally, this chapter will summarize results of the analysis.

As will be illustrated in the following sections, a dearth of data required creative means of mapping. This is a common limitation of conducting research in a less developed part of the world. While Chile has relatively accessible data when it exists, much less data is collected and stored for long periods of time than in more developed countries such as the United States.

B. Mapping Social Class.

In order to measure changes in sociospatial segregation, I began by developing maps of social class for the years 1982, 1992, and 2000. These time periods were chosen because censuses was taken in 1982 and 1992 and I
conducted fieldwork during 1999/2000. Pre-1982 censuses did not provide adequate detail and were, therefore, not useful for this project. Since La Serena-Coquimbo is not a large urban area, I wanted to work at the block level (manzana). A larger unit of analysis, such as census tracts (distritos), does not adequately reflect the diverse local variation of wealth in La Serena-Coquimbo.

As explained in Chapter 2, social class in Chile is best seen in terms of wealth. For purposes of this study, therefore, I wanted to focus on sociospatial segregation in these terms. In other words, I wanted to know where high income, middle income, and low-income people live in La Serena-Coquimbo, and how this has changed over time. However, income and asset data are not available at the block or tract level in Chile. As a result, I had to develop surrogate measures for social class. Further complications arose due to the fact that I had census data for only two time periods. A new census was taken in early 2002 and data are not yet available.

1. The 2000 Map.

The fact that block level, quantitative data were not available for the year 2000 meant that I had to develop a qualitative means of mapping social class for that year. I decided that five social class categories would allow mapping of sufficient socioeconomic diversity. Fewer categories would have hidden socioeconomic differences while more categories would have been difficult with a subjective qualitative analysis.
As a surrogate for measuring income and assets, I conducted a visual analysis of housing. Housing and wealth are closely associated in that, on average, poor people will live in smaller and lower quality homes, while rich people will live in larger, better-kept homes.

The qualitative criteria used to map social class were as follows:

Class 1—Low class. This consisted of self-help housing and a large portion of government social housing (Fig. 5.1).

Class 2—Lower-middle or upper-low class. This consisted of housing developed by unions for workers and social housing that had “accreted.” (Fig. 5.2).

Class 3—Middle-class. Housing in this category included older social housing that was fully accreted and smaller privately built detached housing. (Fig. 5.3).

Class 4—Upper-middle class. This group consisted of larger single family homes, many of which would not be out of place in the United States. (Fig. 5.4).

Class 5—Upper-class. These home were larger than average and would be considered upper class in the United States as well. (Fig. 5.5).
Figure 5.1. Example of Class 1 (Low).

Figure 5.2. Example of Class 2 (Lower middle).

Figure 5.3. Example of Class 3 (Middle).
Based on these five categories, social class was mapped at the block level through field observation. A 1992 census map and 1999 regional government GIS road map were used as base maps, with newly developed areas digitized in by hand. Latin American cities are not as locally homogenous as North American cities, which meant that in many cases I had to determine the “dominant” class for a block. For example, a block with ten moderately sized single-family homes (Class 3) and five larger single-family homes (Class 4) would be classified as Class 3. Furthermore, the classification could be modified
by the degree of maintenance in an area. For instance, larger homes that appeared to be in a state of decline would not receive Class 4 ranking.


Mapping social class for 1982 and 1992 presented different problems. In this case, it could not be mapped using visual surrogates for social class. Air photos for 1978 and 1990 were available, but their resolution was only useful for mapping urban boundaries, not for distinguishing housing quality. Therefore, census variables were used as surrogates for social class.

In order to use visual analysis for the year 2000 map and census data for the 1982 and 1992 maps, an assumption was made that these two would have strong correlations. In other words, there should be a relationship between visual wealth (size, type, and condition of house) and variables measured in the census. Someone with a large, well kept house is probably upper-income (visual analysis). In addition, this person probably has a higher education, more household amenities (washer, color TV, VCR, etc.), and full urban services (municipal water, electricity, sewerage, etc.). Likewise, a lower income person will have a smaller, less well-kept house, a lower education, fewer household amenities, and, possibly, limited urban services. These variables, and others, are included in the population and housing censuses. The question then, is how do we know which census variables are most closely related to house type?
Regression analysis was used to identify key census variables. Once they were determined they were used to predict where different social classes were located during 1982 and 1992. The dependent variable was Social Class 2000, as mapped from the visual analysis. The independent variables included various items from the 1982 and 1992 housing and population censuses. By using year 2000 data for the dependent variable and 1992 data for the independent variables, an assumption had to be made that existing neighborhoods did not change social class during that eight-year period. While it is certain that some neighborhoods did change, especially lower class areas that tend to accrete according to the Griffin and Ford (1980) model, it was assumed that the majority of neighborhoods remained stable. Thus, 1992 social class could be predicted based on 2000 social class.

The following steps were used to calculate the regression coefficients. First, bivariate correlations were run with SPSS for all 1982 and 1992 census variables. Those with a Pearson’s correlation of 0.5 or greater were selected. If a variable was related only to a similar variable (i.e. indoor plumbing only having a strong correlation with public water connections) it was left out. This eliminated variables that were unrelated to anything or so uncommon that there was no relationship.

Analysis of bivariate correlations reduced the variable list to: public water system, other water source, public electrical system, no electricity, indoor plumbing, color TV, VCR, stereo, programmable washing machine, washing
machine, refrigerator, microwave oven, public sewer, telephone, no plumbing, no sewer, brick walls, adobe walls, dirt floor, zinc roof, pizarreño roof, fonolita roof, years of education, professional occupation, office occupation, mechanical occupations, and non-classified occupations.

This list was then compared to 1982 variables. Only those that were common to both years were selected. In some cases, variables were combined to match 1982. This resulted in the elimination of: VCR, stereo, microwave, mechanical occupations, and non-classified occupations. Combined variables include: public electrical system + generator + other electrical system = with electricity; indoor plumbing + outdoor plumbing = with water; programmable washer + washer = washing machine.

The final variable list was then analyzed with SPSS. Stepwise regressions were run, with colinearity statistics. The stepwise regressions produced 11 models. The model with the fewest variables that also had an adjusted r2 of at least 0.7 and no colinearity was selected.

The selected model included years of education, telephone, refrigerator, and Pizarreño roof. These four variables can be seen as differentiating social classes. Education would be expected in that higher levels of education are consistent predictors of wealth (IADB, 1998). The presence of household possessions, in this case telephones and refrigerators, also help to distinguish households with higher incomes. Finally, roofs made of Pizarreño are a significant predictor of social class. Pizarreño is a brand name for a fiber-cement
roofing material in Chile, commonly used in government housing and middle class homes.

The model was used to calculate predicted 1982 and 1992 values based on the unstandardized B coefficients (Tables 5.1 and 5.2).

**Table 5.1 Regression R2.**

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0.837</td>
<td>0.701</td>
<td>0.700</td>
<td>1.487</td>
</tr>
</tbody>
</table>

**Table 5.2 Regression Summary**

<table>
<thead>
<tr>
<th>Model</th>
<th>B</th>
<th>Std. Error</th>
<th>Beta</th>
<th>t</th>
<th>Sig.</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Constant)</td>
<td>-1.140E-03</td>
<td>0.077</td>
<td>-0.015</td>
<td>988</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Education</td>
<td>0.162</td>
<td>0.009</td>
<td>0.335</td>
<td>17.167</td>
<td>0.000</td>
<td>0.345</td>
</tr>
<tr>
<td>telephone</td>
<td>0.884</td>
<td>0.058</td>
<td>0.259</td>
<td>15.144</td>
<td>0.000</td>
<td>0.450</td>
</tr>
<tr>
<td>refrigerator</td>
<td>1.087</td>
<td>0.065</td>
<td>0.334</td>
<td>16.760</td>
<td>0.000</td>
<td>0.331</td>
</tr>
<tr>
<td>Pizarreño</td>
<td>-.310</td>
<td>0.032</td>
<td>-.116</td>
<td>9.679</td>
<td>0.000</td>
<td>0.920</td>
</tr>
</tbody>
</table>

Dependent Variable: CLS2000
Collinearity exists when Tolerance is less than 0.1 or VIF is greater than 10.

Preliminary social class was mapped in Arcview and categorized by standard deviations of predicted regression scores. By mapping by standard deviations, the data were grouped according to variation from the mean for each time period. This standardized the data between time periods, thus making the maps comparable. The year 2000 map, having 5 discrete categories, places each class in one .5 standard deviation category. In other words, class 1 is in the −1 to
-0.5 standard deviation category, class 2 is -0.5 to 0.5, class 3 is 0.5 to 1.5, class 4 is 1.5 to 2.0, and class 5 is 2.0 to 2.5. Both the 1982 and 1992 classes were assigned in the same way.

Once social class was assigned to each census block, residuals were checked for spatial autocorrelation. The G*ij(d) statistic was used to spatially filter the data, which results in a new regression model that is free of spatial autocorrelation (Weeks et al, 2002). This technique creates two new variables for each independent variable, one that represents spatial effects on the data and one that represents filtered, or non-spatial effects. These two variables replace the original independent variable in the regression analysis. This resulted in a new regression formula, where Class 2000 was the dependent variable and the independent variables were “education (filtered),” “education (spatial),” “telephone (filtered),” “telephone (spatial),” “refrigerator (filtered),” refrigerator (spatial),” “pizarreño (filtered),” and “pizarreño (spatial).” The regression output is shown in Tables 5.3 and 5.4.

**Table 5.3. Spatially Filtered Regression R2.**

<table>
<thead>
<tr>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.855396</td>
<td>0.731706075</td>
<td>0.730784496</td>
<td>0.476893854</td>
</tr>
</tbody>
</table>
Table 5.4. Spatially Filtered Regression Summary.

<table>
<thead>
<tr>
<th></th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
<th>Collinearity Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
<td>Tolerance/VIF</td>
</tr>
<tr>
<td>(Constant)</td>
<td>0.996</td>
<td>0.099</td>
<td>10.066</td>
<td>0</td>
<td></td>
</tr>
<tr>
<td>ED.SPAT</td>
<td>0.259</td>
<td>0.017</td>
<td>0.438</td>
<td>15.065</td>
<td>0.136</td>
</tr>
<tr>
<td>ED.FILT</td>
<td>0.422-02</td>
<td>0.011</td>
<td>0.111</td>
<td>9.187</td>
<td>0.794</td>
</tr>
<tr>
<td>REFRIG.FIL</td>
<td>0.783</td>
<td>0.067</td>
<td>0.184</td>
<td>11.708</td>
<td>0.465</td>
</tr>
<tr>
<td>REFRIG.SPA</td>
<td>0.955</td>
<td>0.116</td>
<td>0.252</td>
<td>8.232</td>
<td>0.123</td>
</tr>
<tr>
<td>PIZ.SPAT</td>
<td>-0.384</td>
<td>0.032</td>
<td>-0.268</td>
<td>-11.958</td>
<td>0.229</td>
</tr>
<tr>
<td>PIZ.FILT</td>
<td>-0.362</td>
<td>0.033</td>
<td>-0.244</td>
<td>-11.068</td>
<td>0.237</td>
</tr>
<tr>
<td>PHONE.SPAT</td>
<td>0.725</td>
<td>0.062</td>
<td>0.279</td>
<td>11.645</td>
<td>0.201</td>
</tr>
<tr>
<td>PHONE.FILT</td>
<td>0.68</td>
<td>0.06</td>
<td>0.24</td>
<td>11.236</td>
<td>0.253</td>
</tr>
</tbody>
</table>

The spatially filtered regression was then used to re-calculate social class for 1982 and 1992. Results were again mapped by standard deviation. The final maps are shown in Figures 5.6 through 5.8.
Figure 5.6. Social Class 1982.
Figure 5.7. Social Class 1992.
Figure 5.8. Social Class 2000.

Social Class 2000

- Major roads
- Elqui River
- Coastline

Social Class:
- Non-residential
- Low
- Lower middle
- Middle
- Upper middle
- Upper

Scale: 0.5 0.5 1 1.5 Miles

N
C. Employment and Commerce Maps.

Unequal access to jobs and services is a potential consequence of sociospatial segregation. Because of this, two additional maps were created: one with the location of employers, and another with the location of major commercial centers.

In order to analyze changing spatial relationships between social classes and employment and commerce, two additional Arcview themes were created for each time period. First, employment locations were mapped based on addresses from the 1999 La Serena-Coquimbo telephone directory. These data have limitations in that only businesses listed in the directory were included. Furthermore, no information on the number of employees is included. A factory with 150 employees would be represented in the same way as a four employee doctor’s office. A final limitation is that there is no residence to employment data to link where people actually live and work. Nevertheless, the mapped points reflect the actual patterns of employers. Figures 5.9 through 5.11 show high concentrations of employers in downtown La Serena, downtown Coquimbo, the Balmaceda corridor, and the Tierras Blancas industrial park. Additional employers are scattered around the city. It is reasonable to assume that, on average, these points reflect the majority of employment sites in the urban area.

For 1982 and 1992 there were no phone directories available. Employment maps were made by “clipping” away the 1999 businesses from the 1982 and 1992 urban areas. In other words, it was assumed that if a location had
a business in 1999, then there was probably a business there in 1982 and 1992 if the area was urbanized in 1982 or 1992. This is probably not always the case, but it must be assumed that on average, patterns of employer location are accurately represented.

A second theme shows the location of large grocery stores and major shopping areas, such as the mall and the large home improvement and mega-retail store (Figures 5.12 through 5.14). These large commercial centers were chosen because they offer a wider selection and more competitive prices than small “mom and pop” stores. The year 2000 theme was mapped from field observation and the phone directory. In 1982 and 1992 there was no mall, home-improvement center, or mega-retail store. Grocery stores for these time periods were mapped based on knowledge of local residents.
Figure 5.9. Social Class 1982 with Business Locations.

Social Class 1982
with Business Locations

- Major roads
- Elqui River
- Coastline
- Businesses

Social Class
- Non-Residential
- Low
- Lower middle
- Middle
- Upper middle
- Upper

0.5 1 1.5 Miles
Figure 5.10. Social Class 1992 with Business Locations.

Social Class 1992
with Business Locations

- Elqui River
- Major roads
- Coastline
- Businesses

Social Class
- Non-residential
- Low
- Lower middle
- Middle
- Upper middle
- Upper

N

0.5 0 0.5 1 1.5 Miles
Figure 5.11. Social Class 2000 with Business Locations.

Social Class 2000
with Business Locations

- Major roads
- Elqui River
- Coastline
- Businesses

Social Class:
- Non-residential
- Low
- Lower middle
- Middle
- Upper middle
- Upper
Figure 5.13. Commerce 1992.
Figure 5.14. Commerce 2000.
D. Limitations of the Methodology.

The methods used to create social class, employment, and commerce maps include several limitations that must be acknowledged. Due to constraints on data availability, some less than ideal decisions had to be made. While the overall results of the maps should be reliable, it is certain than they are not 100% accurate, and could be improved with better information.

There are two important limitations to the social class maps. First, the visual classification was, by nature, very subjective. There can be errors in judgment when trying to fit entire city blocks into a single social class category. Intra-block diversity is lost in this way. Furthermore, there can be errors in assigning social class to people or households based on appearance of their homes. Households may have been affluent at one point in time and purchased a large house, but due to a recent economic downturn may have lost a significant portion of their income. This would not be reflected in the social class maps. Second, there is an eight-year gap between the independent variables (census data, 1992) and the dependent variable (visual classification, 2000). An assumption had to be made that there was no change in social class during this eight-year period. Obviously this is not always the case. Households can become richer or poorer during this time, while remaining in the same home. This can alter the predictive power of the regression analysis.

In order to improve the social class maps, it would be helpful to have income and land value data for each city block. This data exists with the Chilean
IRS, but it is not publicly available. Another way to improve the maps would be to use block level data from the 2002 census, rather than a visual analysis. In this way, quantitative data for all three time periods could be used, which should eliminate some of the classification error. Block level data should be released soon.

The employment maps suffer from lack of data as well. There was no public data with the location of all businesses. Only those listed in the telephone directory were used. This seems to represent the general patterns of business location, but potentially leaves out smaller businesses without telephones. Likewise, there is no data on the number of employees per business. A large factory is represented by a single dot, just as a small corner market is. This meant that there is no way to weight businesses based on number of employees. Finally, there is no business data prior to the 1999 telephone directory. Business location for 1982 and 1992 was determined merely by clipping away businesses in parts of the city that were not urbanized during those time periods. This makes historic business location less accurate.

Business maps could be improved only by acquiring detailed data on the location of all businesses. Municipal governments have data on all business licenses, but it is not publicly available. Old phone directories were not available either—even in corporate headquarters in Santiago.

Commerce maps are also limited for 1982 and 1992. For these time periods I had to rely on knowledge of local residents to tell me where grocery
stores existed. People's memory is imperfect, so there is a possibility that some stores were inadvertently omitted. This could be improved only by finding old business data or telephone directories.

Despite data limitations, the overall patterns of social class, business, and commerce appear to be accurate. Based on personal knowledge of the city, all of the maps reflect reality to a large degree. The social class of some individual city blocks may be misclassified, but the general classification of communities appears to be accurate. The same holds true for the location of businesses. Commercial centers are clearly located in central city areas and along a commercial thoroughfare, with scattered businesses throughout the city. Likewise, commerce appears to be well represented on the maps.

E. Analysis of Sociospatial Segregation.

Once all of the maps were finalized, the core questions of this dissertation could be analyzed:

1. Has sociospatial segregation increased over time?

2. Is access to employment and commerce, as measured in distance from residential areas, decreasing for lower classes?

In order to answer these questions, point pattern analysis (PPA) and Arcview Spatial Analyst were used.
1. Point Pattern Analysis.

Point pattern analysis includes a variety of statistical tools that analyze the spatial distribution of points on a surface (Boots and Getis, 1988). In essence, PPA analyzes points to determine if they possess complete spatial randomness, are clustered, or lie in a regular pattern. Complete spatial randomness occurs when each location on a surface has an equal probability of receiving a point and the selection of a location for a point does not affect the selection of other locations. Clustered patterns occur when points are more closely grouped than under complete spatial randomness. Clusters can also be seen as locations that “attract” points. Regular patterns occur when points are more spread out than would be expected under complete spatial randomness. In this case, points can be said to “repel” each other.

Moeur (1999) has developed PPA software for Ripley’s $K(d)$. This statistic analyzes spatial distributions by calculating the distance between all combinations of pairs of points. Ripley’s $K(d)$ can be run with a single set of points (univariate analysis) to determine if they are random, clustered, or regular. It can also be run with two sets of points (Bivariate analysis) to determine if there is significant spatial interaction between the sets. Bivariate Ripley’s $K(d)$ has been used by ecologists to study the spatial relationships of different tree species (Chen and Bradshaw, 1999), but the technique is also well suited for other types of data, such as the social data of this study (Moeur, 1999).
As described in Moeur's (1999) software documentation, bivariate

Ripley's \( K(d) \) functions by comparing

the value computed from the data with those obtained from
multiple realizations generated from a Poisson process \( \hat{K}^p(d) \) in a
Monte Carlo analysis. The steps in this procedure are 1) generate
a set of \( n \) random coordinates (\( n \) equal to the number of points on
the plot); 2) calculate \( \hat{K}^p(d) \) for the random coordinates; 3) repeat
steps 1 and 2 a specified number of times \( NTIMES \); 4) at each
value of \( d \), the \( NTIMES \) values of \( \hat{K}^p_i(d) \) (\( i=1,\ldots,r \)) are ordered,
and the largest and smallest \( ALPHA \) (0.05, for example) of the
values are discarded. The remaining minimum and maximum
values from the random simulations define the boundaries of a
two-sided point-wise (100%-2*\( ALPHA \)*100%) percent
confidence envelope (e.g., 90% for \( ALPHA = 0.05 \)); and 5) \( \hat{K}(d) \)
is compared point-wise with the confidence envelope. The pattern
is rejected as being random for values of \( d \) at which \( \hat{K}(d) \) from
the data falls outside the confidence envelope. If \( \hat{K}(d) \) is above
the envelope, meaning there are more observed neighboring points
in circles of radius \( d \) than expected under a Poisson assumption,
then the observed pattern is said to be clustered or aggregated at
distance \( d \). If \( \hat{K}(d) \) falls below the envelope, the pattern is said to
be uniform or regular.

For a bivariate analysis (\( FROM \) and \( TO \) points from different
populations), the null hypothesis \( H_0 \) is that there is no significant
spatial interaction between the two point patterns (i.e., they are
spatially independent). In this case, the Monte Carlo sequence
preserves the background spatial patterns of the two observed
datasets. The focus population (the \( FROM \) points) are always
held constant, fixed in their original locations. The \( TO \) points are
held in their relative spatial distribution (the points maintain the
same position relative to each other), but the entire population is
shifted randomly around the \( FROM \) points in each Monte Carlo
iteration. The range of the shift is \( \pm \) the length of the X boundary
in the X direction, and \( \pm \) the length of the Y boundary in the Y
direction. If a shifted point falls outside the original plot
boundaries, it is toroidally "wrapped" (reflected around the
opposite boundary), so that it is relocated inside the plot. Then
the K-distribution is computed between the original FROM points and the shifted TO points to determine the confidence envelope boundaries. An estimator for bivariate K(d) is calculated from the combined distributions of distances from type 1 points to type 2 points, and vice versa,

\[ \hat{K}_{12}(d) = \frac{n_2 \hat{K}_{12}^*(d) + n_1 \hat{K}_{21}^*(d)}{n_1 + n_2} \]

where

\[ \hat{K}_{12}^*(d) = \frac{A}{n_1 n_2} \sum_{i=1}^{n_1} \sum_{j=1}^{n_2} w_{ij}(d), \]

\[ \hat{K}_{21}^*(d) = \frac{A}{n_1 n_2} \sum_{i=1}^{n_1} \sum_{j=1}^{n_2} w_{ij}(d), \]

and \( n_1 \) and \( n_2 \) are the number of type 1 and type 2 points, for all pairs of points with \( d_{ij} \leq d \). If the two types of points are farther from one another than expected under the assumption of spatial independence (\( \hat{L}_{12}(d) \) significantly negative), then the interaction between patterns is repulsive. If \( \hat{L}_{12}(d) \) is significantly positive, meaning the two types of points are closer to one another than expected, then the interaction between patterns is attractive. (p. 7-8)

2. Data Input for Point Pattern Analysis.

As input for the bivariate Ripley’s K(d) analysis, each census block was assigned a centroid point using an Arcview script downloaded from the ESRI homepage\(^1\). In some cases, single polygons were much larger than average for the La Serena-Coquimbo region. This was especially true for new polygons that were added to the year 2000 map. This created problems in that a large polygon would receive a single centroid point, just like a small polygon. Thus, large areas

---

\(^1\) See www.esri.com. Script “Polygon Centroid to Point Theme” by Tara Montgomery.
would be underrepresented in the PPA analysis. To account for these differences, large polygons were divided into smaller polygons and each new polygon was assigned a centroid point. Large polygons were split into smaller polygons so that their area was within 2 standard deviations of the mean polygon size for the entire study area.

This process resulted in five sets of points, one for each social class, for each time period (1982, 1992, 2000). Due to the large, irregular shape of the La Serena-Coquimbo urban area, the data were divided into two additional sets, one for La Serena and the other for Coquimbo (based on municipal (comuna) boundaries). Business points were also divided by municipal boundaries for each time period.

3. Arcview Spatial Analyst Analysis.

Analysis of spatial segregation between social class and commerce was performed using Arcview Spatial Analyst. A distance theme was created that calculated the distance to the closest major commercial area (downtown, a major grocery store, the mall, and the homecenter) for each grid cell. The centroid for each social class polygon was converted to a grid. Summary statistics were then calculated which showed the mean distance to the closest commercial area for each social class.
F. Results.

Bivariate Ripley's K(d) were run between each pair of datasets for La Serena and Coquimbo, 1982, 1992, and 2000. The data were analyzed at 500-meter intervals up to the maximum distance allowed for each pair of datasets (<= ½ of the shortest north/south or east/west length). This resulted in a Ripley's K(d) score and 95% confidence envelope boundaries for each 500 meter interval. If the K(d) score fell above the confidence envelope, the two social classes were considered clustered. If the K(d) score fell within the confidence envelope, there was no spatial interaction. If the K(d) score fell below the confidence envelope, the two social classes were considered repulsed.

It is interesting to note that none of the analyses resulted in K(d) scores below the confidence envelope. This means that social classes in La Serena-Coquimbo are not so spatially segregated that they repel one another. This supports the morphological assumptions applied to Latin American cities in that, while there are distinct class-based neighborhoods, they are not as large or as homogenous as those found in places such as the United States.
Table 5.5. Smallest Distance of Clustering between Social Classes.

<table>
<thead>
<tr>
<th></th>
<th>Coquimbo</th>
<th>La Serena</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>1</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>2</td>
<td>500</td>
<td>500</td>
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<tr>
<td>3</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>4</td>
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<td>500</td>
</tr>
<tr>
<td>5</td>
<td>500</td>
<td>500</td>
</tr>
</tbody>
</table>

Table 5.5 summarizes the results of this analysis. This table shows the distance in meters where clustering between social classes begins (i.e. the distance where K(d) falls above the 95% confidence envelope). Zeros represent no significant spatial clustering (i.e. where K(d) remains within the 95% confidence envelope). In essence, clustering at short distances (500 meters) represents a mixture of two social classes within a 500-meter radius. This means that the two social classes are grouped together within a small local area. Clustering at larger distances (1500 meters for example) means that two social groups are only spatially related when a 1500-meter radius is used. This indicates that the two classes are only considered grouped together when a larger
piece of the city is considered. A zero means that two social classes are not spatially related at any distance.

The remainder of this chapter will describe how cluster patterns have changed in La Serena-Coquimbo between 1982 and 2000.

1. La Serena Results.

a. Class 1 (Lower Class).

In 1982, lower class neighborhoods (class 1) were clustered with lower-middle class areas (class 2) from a scale of 500 meters. This local scale clustering means that the poor lived in areas shared by the lower middle class. There was no clustering of class 1 with any other class during this time period. The same pattern continues through 1992 and 2000. Thus, it can be said that spatial segregation of the lower class in La Serena has been unchanged since 1982. While there is clustering with low and lower middle class groups, that has been the case for at least two decades.

b. Class 2 (Lower Middle Class).

In 1982, lower middle class groups were locally clustered (at 500 meters) with low (class 1) and middle (class 3) class neighborhoods. This shows that the lower middle class shared space with the lower class and the middle class. The same pattern can be seen in 1992. However, by 2000, lower middle class groups (class 2) are only locally clustered with low-income areas (class 1). This
indicates increased separation between the lower middle class and the middle class between 1992 and 2000. During this time, lower middle class areas separated from the middle class and clustered only with the lower class.

c. Class 3 (Middle Class).

In 1982 and 1992, the middle class of La Serena was locally clustered with all classes except the lowest. Once again, however, by 2000 the middle and lower-middle classes (class 3 and class 2) are no longer clustered together. This leaves the middle class locally clustered with the upper middle and upper classes, indicating increasing sociospatial segregation between 1992 and 2000. This means that by the year 2000, the lowest two classes and the upper three classes were not clustered at all.

d. Class 4 (Upper Middle Class).

The upper middle class of La Serena is locally clustered with the middle and upper classes (class 3 and class 5) during all three time periods. This indicates that at least since 1982, the upper middle class has not shared space with the lowest two social classes.
e. Class 5 (Upper Class).

The upper class follows the same pattern as the upper middle class for all three time periods. Local clustering only occurs with middle and upper middle class blocks and there is no spatial interaction with the lower two classes.

2. Coquimbo Results.

a. Class 1 (Lower Class).

In Coquimbo in 1982, lower class areas (class 1) were clustered with lower-middle groups (class 2) at 500 meters, middle-income groups (class 3) at 1000 meters, and upper-middle and upper-income groups (classes 4-5) at 1500 meters. This indicates that during this time period, the poor in Coquimbo shared space with other social groups to a greater degree than their counterparts in La Serena. Nevertheless, the poor in Coquimbo were more closely clustered with the lower middle class (500 meters) than with other socioeconomic classes, who had an additional 500 to 1000 meters separating them from the poor.

By 1992, the low class (class 1) became further separated (1500 meters) from the middle class (class 3) than in the previous decade. Sociospatial segregation also increased in relation to the upper-middle and upper classes (classes 4-5), where there was a total loss of clustering. In the year 2000, the low class (class 1) remained segregated from the upper classes (classes 4-5). However, segregation from the middle class (class 3) decreased, becoming clustered at a local scale of 500 meters.
b. Class 2 (Lower Middle Class).

Lower middle class areas (class 2) in 1982 were locally clustered (500 meters) with all social classes. By 1992, sociospatial segregation can be seen as class 2 becomes isolated from the upper class (class 5), where clustering was lost. Sociospatial segregation continued in 2000, where the spatial relationship with the upper middle class was lost as well.

c. Class 3 (Middle Class).

The middle class (class 3) shows local clustering (500 meters) with all other classes in 1982. By 1992, the middle class pulls away somewhat from the low class, with clustering at 1000 meters, but this segregation is lost by 2000. There is increased separation with class 5 by the year 2000, where no clustering occurs. Thus, the middle class in the year 2000 remains locally clustered with all social classes except the upper class in Coquimbo.

d. Class 4 (Upper Middle Class).

The upper middle class (class 4) clusters at 500 meters with all social classes except the low class (class 1) in 1982. By 1992 there is increased sociospatial segregation with the lower and lower-middle classes (classes 1-2), where clustering is lost. In 2000, clustering only occurs with class 3 at 2000 meters and the only local clustering remains with class 5 (500 meters). This indicates that strong local spatial interaction exists only with the upper class.
e. Class 5 (Upper Class).

In 1982 the upper class (class 5) clusters with lower class groups (class 1) at 1000 meters. Class 5 is more locally clustered with lower middle through upper-middle groups (classes 2 through 4), indicating slightly greater separation from the poorest class. By 1992, the separation from classes 1 and 2 is lost. Local clustering (500 meters) continues only with classes 3 and 4.

Sociospatial segregation continues through 2000, when clustering with middle class groups (class 3) only occurs at 2500 meters. Local clustering (500 meters) remains only with the upper-middle class (class 4). As was seen with class 4, the upper class only has local spatial interaction with the upper middle class.

G. Summary of Sociospatial Segregation.

As indicated in Table 5.5 and the discussion above, there has been an increase in sociospatial segregation between 1982 and 2000, as local clustering has declined between upper and lower class sections of La Serena-Coquimbo. This pattern is more pronounced in Coquimbo than La Serena. For instance, in La Serena social classes were relatively non-clustered in 1982. By 2000 the lower middle class (class 2) and middle class (class 3) lost their clustering, and the middle class (class 3) had become further removed from the upper class (class 5). In Coquimbo, on the other hand, local clustering between most classes in 1982, including the upper and lower classes, declined substantially. This is
especially evident with the two upper classes. These were clustered at 500 to 1000 meters with all classes in 1982, but had become completely separated from the lower two classes by 2000 and were only clustered with the middle class at 2000 to 2500 meters.

The greatest sociospatial segregation occurred between 1992 and 2000 in La Serena, when all changes in clustering occurred. In Coquimbo, there was stronger segregation from 1982 to 1992. During this time, two pairs of social classes saw increases of at least 500 meters in their clustering and seven pairs became non-clustered. Between 1992 and 2000 two more pairs of social classes saw clustering increase by at least 500 meters, and two pairs became non-clustered. The only exception to increased segregation occurred between the low and middle classes by 2000, where they became more clustered.

**H. Access to Employment Results.**

In addition to analyzing sociospatial change over time, access to employment by social class was analyzed. Table 5.6 illustrate differences in the clustering of social classes and employment between La Serena and Coquimbo. In La Serena, the two lowest classes are not clustered with businesses during 1982. In 1992, the lower-middle class (class 2) is clustered with employment, but only at 3000 meters. By 2000 there is also clustering of the lower class (class 1), but only at 3500 meters. The upper three classes in La Serena are all locally clustered (500 meters) with employment centers. This remains unchanged from
1982 to 2000 with the exception of the upper class (class 5), which moves slightly further away from employment points, clustering at a distance of 1000 meters in the year 2000. These results indicate that the lower classes have to travel further to work than the middle and upper classes. In contrast to what was expected, this has not worsened over time. The fact that the upper class is now slightly further from employment is insignificant in that they are more likely to have private automobiles.

Table 5.6. Social Class and Business Clustering.

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<tbody>
<tr>
<td>class 1</td>
<td>500</td>
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<tr>
<td>5</td>
<td>500</td>
<td>500</td>
<td>0</td>
</tr>
</tbody>
</table>

In Coquimbo, access to employment is less of a concern. Almost all social classes from 1982 to 2000 are locally clustered (500 meters) with employment points. The only exception is the upper class in 2000, which is not clustered with employment. Again, this is insignificant in that the upper class can go to work in private automobiles.
I. Access to Commerce Results.

Finally, access to commercial areas was analyzed. Table 5.7 shows the mean distance in meters from each social class to a major commercial area. In 1982 and 1992 this included major supermarkets, downtown La Serena, and downtown Coquimbo. In 2000, a regional shopping mall and a home-center were included.

The mean distance to commercial centers varied significantly by social class in La Serena between 1982 and 2000. The lowest two classes were located furthest from major commercial areas. This increased over time, indicating that major new commercial areas do not accompany new lower income communities. The middle through upper classes (classes 3 through 5) were located much closer to commercial areas, with the exception of class 5 in the year 2000. Once again, the upper class has private automobiles that compensate for distance.

Access to major commercial areas in Coquimbo shows different patterns. From 1982 to 2000, access has improved for the lowest class (class 1). For the lower-middle class (class 2), access declined somewhat between 1982 and 1992, but then improved by 2000. The middle class (class 3) saw lower access between 1982 and 1992, but their access improved from 1992 to 2000, although the mean distance in 2000 was not a low as in 1982. The upper two classes have been the furthest from commercial areas since 1992 and have seen steadily increasing distances between 1982 and 2000. Again, private automobiles can easily overcome distance.
Table 5.7. Social Class and Distance to Commerce.

<table>
<thead>
<tr>
<th>Mean Distance to Commerce: La Serena (meters)</th>
<th>Mean Distance to Commerce: Coquimbo (meters)</th>
</tr>
</thead>
<tbody>
<tr>
<td>------</td>
<td>------</td>
</tr>
<tr>
<td>1</td>
<td>2296</td>
</tr>
<tr>
<td>2</td>
<td>1706</td>
</tr>
<tr>
<td>3</td>
<td>583</td>
</tr>
<tr>
<td>4</td>
<td>358</td>
</tr>
<tr>
<td>5</td>
<td>429</td>
</tr>
</tbody>
</table>

J. Conclusion

This chapter has described methods of analysis and changing sociospatial patterns. The following chapter will discuss and explain these patterns, placing them in the context of changing urban and economic conditions in La Serena-Coquimbo. Specifically, the various patterns will be discussed in relation to the five themes covered in chapters 2 and 3: sociospatial segregation and income distribution, transportation, infrastructure, land use/markets, and housing.
Chapter 6

Sociospatial Segregation in La Serena-Coquimbo

A. Introduction.

Chapter 2 illustrated how urban morphological models and economic theory can be used to understand changes in sociospatial segregation. Specifically, it was shown that these models and theories can be used to explain how income distribution, transportation, infrastructure development, land use/markets, and housing affect sociospatial segregation differently under ISI and neoliberalism. Chapter 3 presented data and examples as to how Latin America and Chile have changed in these areas. Chapter 4 presented background information on La Serena-Coquimbo, while Chapter 5 showed how sociospatial segregation in La Serena-Coquimbo changed between 1982 and 2000. This chapter will explain the changes discussed in Chapter 5, showing the influence of income distribution, transportation, infrastructure, land use/markets, and housing on sociospatial segregation.¹

B. Income Distribution.

Specific income distribution data for La Serena-Coquimbo is not available. The largest scale data available are for urban areas of the IV Region between the years 1987 and 1998. These data should represent La Serena-
Coquimbo relatively well in that the majority of the IV Region’s urban residents live in this area. For example, in 1992 the La Serena-Coquimbo urban area accounted for 62% of the region’s urban population (INE, 1996). Figure 6.1 shows that urban areas of the IV Region have slightly lower levels of inequality than urban areas of the country as a whole. This is probably due to the fact that upper-income deciles are concentrated in Santiago. It must be remembered that the top decile heavily skews income distribution in Chile. If the top decile does not reside in the IV Region, less income inequality should be expected.

**Figure 6.1. Gini Coefficients. IV Region Urban and National Urban. 1987 to 1998.**

While Ferreira and Litchfield (1998) and Székely and Hilgert (1999) state that national fluctuations in Gini scores are not significant, it appears that fluctuations in the IV Region are more pronounced. Several explanations may

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1 See Appendices for maps of physical features, community names, and photos of study area.
account for differences between Gini scores in urban areas of the IV Region and urban areas of the entire country.

1. Income distribution 1982 to 1992

Why was there a major increase in urban inequality in the IV Region between 1987 and 1990? One explanation is that the data are incorrect. Data from the IV Region contrasts with urban data for the nation, which show that inequality declined slightly. With a single data point for 1987 and no data immediately before or after, it is impossible to determine if there was truly a dramatic increase in inequality, or if the data are faulty.

Assuming that the data for 1987 are good, additional explanations must be pursued. Three factors can affect income distribution at a local level. First, there can be a change in the amount of money earned by each decile. If incomes in upper deciles grow more rapidly than in lower deciles, income inequality will increase. Second, migration can affect local income distributions. If a large number of migrants from a single decile move to an area, inequality may increase. Third, government programs that redistribute wealth can affect income distributions. If social programs are targeted at lower deciles, inequality is more likely to decrease.

Figure 6.2 shows that per capita income in the IV Region increased between 1987 and 1990. Income data by decile for the IV Region are not available, so it is impossible to know for sure if any group was receiving a larger
share of income growth than another. As a surrogate measure of income distribution by decile, differential growth rates of segments of the local economy can be compared to average incomes by corresponding segments. Between 1987 and 1990, the fastest growth (>50% growth) in the IV Region (measured in pesos) occurred in construction, transportation/communications and fishing (Table 6.1). This was followed by strong growth in commerce/hotels/restaurants, and agriculture (>40% growth). Between 1987 and 1992 the fastest growth was in construction and financial services (>90%) and agriculture (>80%). This was followed by fishing and commerce/hotels/restaurants (>70%). Growth in these sectors was directly related to growth of the region’s export economy under neoliberalism as well as the expansion of tourism. Increased production in agricultural and fishing, along with tourism, fed the need for new commercial and residential building, transportation of people and goods, and financial services.

**Figure 6.2. Per Capita Urban Income, IV Region.**

(MIDEPLAN, 2001)

<table>
<thead>
<tr>
<th>IV Region</th>
<th>% increase (millions of 1986 pesos) 1987 to 1990</th>
<th>% increase (millions of 1986 pesos) 1987 to 1992</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agriculture, Cattle, Forestry</td>
<td>41.72%</td>
<td>88.80%</td>
</tr>
<tr>
<td>Fishing</td>
<td>52.31%</td>
<td>74.66%</td>
</tr>
<tr>
<td>Mining</td>
<td>34.85%</td>
<td>41.93%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>37.90%</td>
<td>66.65%</td>
</tr>
<tr>
<td>Electricity, Gas, Water</td>
<td>-1.71%</td>
<td>40.31%</td>
</tr>
<tr>
<td>Construction</td>
<td>55.96%</td>
<td>151.65%</td>
</tr>
<tr>
<td>Commerce, Hotels, Restaurants</td>
<td>40.78%</td>
<td>74.09%</td>
</tr>
<tr>
<td>Transportation, Communication</td>
<td>52.96%</td>
<td>68.31%</td>
</tr>
<tr>
<td>Financial Services</td>
<td>30.97%</td>
<td>95.41%</td>
</tr>
<tr>
<td>Real Estate</td>
<td>4.87%</td>
<td>8.57%</td>
</tr>
<tr>
<td>Personal Services</td>
<td>0.30%</td>
<td>9.95%</td>
</tr>
<tr>
<td>Public Administration</td>
<td>3.43%</td>
<td>8.33%</td>
</tr>
<tr>
<td><strong>Banco Central (2002)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In the urban area of La Serena-Coquimbo, census data from 1982 and 1992 illustrate changes in the local economy. A slightly different classification scheme between the 1982 and 1992 censuses makes direct comparisons with all categories in Table 6.1 impossible. However, the segments of highest employment growth do correspond well (Table 6.2). In La Serena-Coquimbo, financial services grew significantly faster than any other segment of the economy (>200% growth). Strong growth was also seen in construction (>100% growth), and commerce/hotels/restaurants and manufacturing (>90%). This indicates that financial positions related to the region’s export economy and tourism were located in La Serena-Coquimbo. Regional manufacturing was also heavily concentrated in La Serena-Coquimbo, specifically the Tierras Blancas
industrial park. The expansion of tourism is reflected in growth in
commerce/hotels/restaurants. Strong economic growth fueled the demand for
construction. For example, in 1990, 64% of the total floor-area built in the
region was in La Serena-Coquimbo (INE 1992). By 1992, this had reached 78%.

Table 6.2. Employment by Sector.

<table>
<thead>
<tr>
<th>Urban La Serena-Coquimbo</th>
<th>% Change in Number of Employed 1982 to 1992</th>
<th>% employed 1992</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mining</td>
<td>13.34%</td>
<td>5.15%</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>93.02%</td>
<td>12.90%</td>
</tr>
<tr>
<td>Electricity, Gas, Water</td>
<td>38.69%</td>
<td>0.63%</td>
</tr>
<tr>
<td>Construction</td>
<td>121.37%</td>
<td>10.89%</td>
</tr>
<tr>
<td>Commerce, Hotels, Restaurants</td>
<td>98.79%</td>
<td>22.30%</td>
</tr>
<tr>
<td>Transportation, Communication</td>
<td>59.69%</td>
<td>8.63%</td>
</tr>
<tr>
<td>Financial Services</td>
<td>247.33%</td>
<td>5.03%</td>
</tr>
<tr>
<td>INE 1982, 1992</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

When compared to data on average income by economic sector, it is
possible to see how income distributions changed between the late 1980s and
early 1990s. Table 6.3 shows average income per worker by economic sector for
the IV Region in 1992.

Table 6.3. Average Income by Economic Sector.

<table>
<thead>
<tr>
<th>IV Region, 1992 (pesos per month)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Banking and finance</td>
<td>191,572</td>
</tr>
<tr>
<td>Transportation, communication</td>
<td>114,169</td>
</tr>
<tr>
<td>Commerce</td>
<td>106,368</td>
</tr>
<tr>
<td>Mining</td>
<td>91,299</td>
</tr>
<tr>
<td>Construction</td>
<td>90,651</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>90,341</td>
</tr>
<tr>
<td>Community and social services</td>
<td>86,561</td>
</tr>
<tr>
<td>Agriculture, fishing, hunting</td>
<td>67,592</td>
</tr>
<tr>
<td>INE 1996</td>
<td></td>
</tr>
</tbody>
</table>

176
The financial sector by 1992 employed over 5% of the workforce of La Serena-Coquimbo. Those who worked in commerce, hotels, and restaurants made up over 22% of the workforce, while construction and manufacturing employees made up another 22%. Financial employees made more than twice as much as construction and manufacturing employees during this time. Rapid growth in high-income financial positions by the early 1990s may help explain the increase in inequality during this time.

Employment and wage data by economic sector show that between 1982 and 1992 income inequality in La Serena-Coquimbo may have grown due to expansion in the income of upper deciles. However, average income by economic sector is a crude measure of local wealth. Positions in categories other than finance, as well as retirees and those with investment income, can also be in upper income deciles. Additional evidence of the growth and concentration of wealth in La Serena-Coquimbo is presented by Bodini and Araya (1998). Based on data from the Chilean Ministry of Public Works, they show that 73% of the IV Region’s “high” socioeconomic households were located in La Serena in 1992. Another 6.5% were in Coquimbo, which resulted in the combined urban area having 79.5% of the region’s wealthy households.

Income distributions in 1987 may have been more equal due to a lack of high-income residents. It must be recalled that the richest 10% of Chile’s population skews income distributions upward. Without this 10%, income distributions are more equal than similar measurements of the United States. In a
sense, the region was uniformly middle to low income. Rapid growth in the late 1980s and early 1990s brought an increase in high paying jobs, which skewed income inequality upward.


Returning to Figure 6.1, which shows Gini scores for urban areas of the IV Region, it can be seen that inequality began to decline in the early 1990s. This decline is best explained by changes in state welfare policies that evolved after the end of the military dictatorship in 1990. As explained in Chapter 3, civilian governments after 1990 continued the basic neoliberal model, but increased spending on the lowest income segments of the population. In the early 1990s, while the average urban income of the IV Region was increasing, it was only 74% that of the national average (MIDEPLAN 2001). Furthermore, the urban poverty rate in the IV Region in 1992 was 42.3%, compared to the national rate of 32.4% (MIDEPLAN 2001). With a larger proportion of the urban population in lower income deciles (as indicated by lower average incomes and higher rates of poverty), state poverty alleviation programs would have a greater impact on inequality in the IV Region than nationally.

The proportion of poverty reduction due to government policies in Chile has been estimated to be between 20 and 40% (Meller, 2000; MIDEPLAN, 2001). The remaining 60 to 80% has been attributed to general economic growth. Through sustained national economic growth and targeted social
spending, poverty reduction nationally and in the IV Region fell dramatically during the 1990s (Figure 6.3). The steepest decline in the IV Region occurred between 1992 and 1994, the same time as the steepest reduction in urban inequality in the region.

Figure 6.3. Urban Poverty Rates, IV Region and National, 1987 to 1998.

![Urban Poverty Rates Graph](image)

(MIDEPLAN, 2001)

Between 1994 and 1998 inequality in the IV Region again increases. The precise reason for this change is difficult to determine until more detailed information is available from the 2002 census, supplemental income surveys, and other government sources. As Figure 6.3 shows, urban poverty rates continued to decline, although not as rapidly as 1992 to 1994. Furthermore, urban incomes and regional economic growth continued to rise (Figure 6.4). Although poverty rates are falling, income inequality may be increasing once again due to more rapid growth in the income of upper decile groups.
Figure 6.4. Economic Indicators, IV Region, 1990 to 1999.

(INE, 2002)

Using the year 2000 social class maps from chapter 5, it can be seen that the area occupied by the upper class grew more rapidly than all other groups between 1992 and 2000 (Table 6.4). The development of very large homes in areas such as Peñuelas and El Milagro indicate that more upper-income residents now live in the city, which should skew income distributions upward.

Table 6.4. Percent Change in Area by Social Class.

<table>
<thead>
<tr>
<th>Class</th>
<th>1992-2000</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>-44%</td>
</tr>
<tr>
<td>2</td>
<td>125%</td>
</tr>
<tr>
<td>3</td>
<td>73%</td>
</tr>
<tr>
<td>4</td>
<td>68%</td>
</tr>
<tr>
<td>5</td>
<td>281%</td>
</tr>
</tbody>
</table>

Based on social class maps.

3. Income Distribution and Sociospatial Segregation.

This section has discussed fluctuations in the income distribution of La Serena-Coquimbo. In general, it can be said that urban inequality is lower than
the national average, yet relatively high compared to the developed world. In the short term there have been fluctuations in inequality, but over the long term (1987 to 1998) there has been a gradual increase in inequality. It has been argued that increases in inequality are directly related to the export orientation of neoliberalism, combined with the “discovery” of La Serena-Coquimbo as a tourist destination. With an increase of exports from the IV Region, La Serena-Coquimbo has expanded significantly as the regional operations center for the export industry. This has increased the supply of high paying jobs and attracted high skilled upper-income migrants to the city. Thus, there has been growth in upper income deciles compared to before the neoliberal export model’s implementation. Furthermore, tourism has attracted upper income groups with oceanfront condominiums and homes. Inequality has been softened somewhat as economic growth and state programs reduced poverty. Nevertheless, upper-income growth has outpaced growth of lower-income groups.

The disproportionate growth of upper-income groups has increased the demand for housing with amenities. In the past, this would have increased land values near the city center. Due to other changes brought about by neoliberal economic policies, the upper class is no longer spatially confined to a small section of the city. Partially due to cultural changes, they now seek amenities outside of the traditional urban core. In the case of La Serena-Coquimbo, this has meant locations along the coast, on ocean-view bluffs, and in large-lot semi-rural sectors.
Income inequality can help to explain the changing patterns of
cospatial segregation presented in chapter 5 (Figures 5.6 through 5.8). La
Serena in 1982 was already relatively segregated by class. Figure 5.6 shows that
lower income groups lived on the periphery of La Serena—to the north (Las
Compañías), east (Antena), and south (around Cuatro Esquinas). Middle and
upper income groups lived in the central city and immediately to the south. This
meant that there was no clustering of classes 1 and 2 with classes 4 and 5. Class
3 was spatially associated with all other classes except the lowest.

By 1992, upper income groups had expanded into the area immediately
south of downtown, with new growth spreading in high amenity areas—east
along ocean view bluffs (Cisternas), and along the coast (Avenida del Mar).
New lower income communities grew adjacent to existing low income areas to
the north (Las Compañías).

By 2000, similar development patterns occurred. Low-income housing
continued to be built in the north of the city (Las Compañías), while upper
income housing grew along the coast (Avenida del Mar) and further east on
coastal bluffs (San Juaquín). Upper income housing also developed on large lots
in non-contiguous patches well to the east of the city (El Milagro). Also by
2000, the middle class (class 3) grew in several large isolated communities in the
eastern portion of the city (Barrio Universitario, El Milagro, east end of Antena).
Additional middle class housing was built on the southern border of Las
Compañías. These large homogenous developments resulted in the loss of clustering with class 2 by the year 2000.

La Serena was already relatively segregated at the beginning of the study period. Continuing high levels of inequality have meant that upper income groups can purchase the most desirable land—with amenities such as views, ocean access, and large suburban parcels. This has maintained segregation between rich and poor. The only measurable change in clustering occurred with the middle class, which pulled away from the lower middle class between 1992 and 2000. The purchasing power of the middle class was not nearly as great as that of the upper classes, but other factors, to be explained later in this chapter, help to explain how they accomplished greater segregation from lower income groups.

Sociospatial segregation increased to a greater degree in Coquimbo than La Serena. In 1982 there was relative integration of social classes, with most classes clustered at 500 meters. There was moderate segregation of the poor (class 1) from the middle and upper classes (i.e. clustering at 1000 to 1500 meters). During this time period Coquimbo had fewer upper class households than La Serena and was dominated by middle and lower income groups. This meant less income inequality and more spatial integration.

By 1992, the upper classes (classes 4 and 5) had lost all spatial relationship with the lower classes (classes 1 and 2). As upper income groups grew, they located primarily in high amenity areas such as La Herradura bay, and
coastal bluffs overlooking the bay and beaches (Peñuelas)—discontinuous developments outside of the traditional urban area. In contrast, lower classes grew adjacent to existing low income communities in the hills of Coquimbo (Parte Alta), Tierras Blancas, and San Juan. Lower income housing was also built near middle class sectors of Sindempart, as well as across the highway from La Herradura, and along the highway in La Cantera. Patterns of upper and lower class housing development during this time resulted in an increase in socio-spatial segregation. Also by 1992, the middle class became more segregated from the lowest class. This was due to the development of middle class communities in Peñuelas, Sindempart, and just north of Tierras Blancas, all of which were far enough from the poor to reduce clustering.

By 2000 there was greater socio-spatial segregation between upper income groups (classes 4 and 5) and the middle class (class 3) in Coquimbo, which became clustered only at distances of two kilometers or more. By this time, upper income groups were concentrated in La Herradura bay, the coast (Avenida del Mar) and coastal bluffs (Peñuelas), and in limited central locations surrounded by the middle class (El Llano). Middle class communities developed extensively in Sindempart, near the Tierras Blancas industrial park, and on coastal bluffs. Furthermore, there was upgrading of housing in San Juan, which became classified as middle class. Lower classes developed around Tierras Blancas, the hills of Coquimbo (Parte Alta), and southeast of Sindempart and San Juan. The proximity of middle class sectors with low class sectors in Tierras
Blancas, Sindempar, and San Juan account for a decline in segregation between these groups during this time.

In 1982 there were very few upper income households in Coquimbo. By 2000 there had been substantial growth in upper income groups, resulting in increases in sociospatial segregation. As with La Serena, upper income groups sought areas of high amenities—the coast, the bay, and view lots from bluffs. The poor located in areas well separated from the rich, primarily near existing low-income communities and south of downtown.

This section has described the increase of income inequality in La Serena-Coquimbo and how upper classes have moved to high amenity areas, resulting in greater sociospatial segregation. It has not explained how they were able to accomplish this. The following sections will explain the how neoliberalism has allowed the upper, and increasingly middle, classes to search for areas of high amenities, moving to more homogenous and suburban locations.

C. Transportation.

The previous section has shown that there are fairly high levels of income inequality in La Serena-Coquimbo. Upper and middle-income groups are pulling away from more central and socioeconomically heterogeneous sectors of the city and moving to areas of high amenities further from the urban core. Growth in the number of private automobiles in La Serena-Coquimbo under neoliberalism helps explain how upper and middle-income groups are pulling
away from core areas of the city and contributing to increased sociospatial segregation.

Data on the number of automobiles per person in La Serena-Coquimbo illustrate this change in mobility. Table 6.5 shows that in 1982, there were 84 cars per 1000 people in La Serena and 42 cars per 1000 people in Coquimbo. By 2001, there were 151 cars per 1000 people in La Serena and 69 cars per 1000 people in Coquimbo. This represents nearly an 80% increase in the number of automobiles per capita in La Serena and an increase of roughly 64% in Coquimbo. Data from 1998 indicate that 24% of households in La Serena and 16.5% of households in Coquimbo had a vehicle for private use (INE, 2002b). While data on the percentage of households with private vehicles is not available for previous time periods, it is reasonable to assume that growth was roughly proportional to growth in automobiles per capita from 1982 to 1992.

Table 6.5. Autos per 1000 People, 1982 to 2001.

<table>
<thead>
<tr>
<th></th>
<th>Autos per 1000 people</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>La Serena</td>
</tr>
<tr>
<td>1982</td>
<td>84</td>
</tr>
<tr>
<td>1992</td>
<td>112</td>
</tr>
<tr>
<td>2001</td>
<td>151</td>
</tr>
</tbody>
</table>

(INE, 2001)

Note: 1982 and 1992 estimated as percentage of Elqui province.

Not only has there been growth in the number of automobiles per capita, and in all likelihood the number of households with private vehicles, but there has been disproportionate growth in lower income households with automobiles.
National data on the number of households with automobiles by income quintile shows how cars are filtering down to lower income groups. Table 6.6 shows that in 1990 very few households below the highest income quintile owned automobiles. As discussed in Chapter 3, the number of autos in Chile had increased substantially over time, yet it can be seen that, in 1990, ownership was still dominated by the wealthiest 20% of the population. By 1998 there had been significant growth in all quintiles, with the highest growth occurring in the bottom three groups. In chapter 3 it was shown how, by 1990, automobile taxes had reached an all time low. Low taxes, combined with strong economic growth in much of the 1990s, meant that a larger segment of the population could afford cars. Incomes were up and car prices were down. As more autos were purchased, there should have been an increase in the supply of used cars, which should have filtered down to lower income groups. As Table 6.6 shows, in 1990, only in the top quintile did more than 20% of households own automobiles. By 1998 more than 20% of households in the top three quintiles owned automobiles. While ownership rates in the bottom two quintiles were still relatively low in 1998, their rates of growth were the highest, indicating a closing gap in ownership rates.
Table 6.6. Percent of Households with Autos by Income Quintile.

<table>
<thead>
<tr>
<th>Income quintile</th>
<th>% of households with auto</th>
<th>1990</th>
<th>1998</th>
<th>% growth 90-98</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 (low)</td>
<td></td>
<td>3.4</td>
<td>7.9</td>
<td>132.0</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>4.9</td>
<td>15.3</td>
<td>212.0</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>10.3</td>
<td>22.0</td>
<td>114.0</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>18.9</td>
<td>38.0</td>
<td>101.0</td>
</tr>
<tr>
<td>5 (high)</td>
<td></td>
<td>48.6</td>
<td>67.8</td>
<td>40.0</td>
</tr>
<tr>
<td>(INE, 2000)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

As a significant proportion of upper and middle-income residents obtain autos, they become more spatially mobile. This allows them to purchase housing at a greater distance from the city center or their place of employment. This helps to explain increasing sociospatial segregation in La Serena-Coquimbo.

La Serena, as mentioned previously, was already largely segregated by 1982. The most significant change in socioeconomic segregation related to the middle class losing its spatial relationship with the lower-middle class. Between 1992 and 2000, two large middle class housing developments were built in areas that are not adjacent to major transportation corridors, one in the Barrio Universitario and another in El Milagro. While public transportation is available in these areas, their low-density suburban style means that public transit is less frequent than in other parts of the city. Private autos allow middle class residents to live in these communities without having to rely completely on less frequent bus or collective taxi service. Without an increasing supply of autos, it is unlikely that low-density middle class communities would have been built in these locations.
In Coquimbo, between 1982 and 1992 the upper and upper-middle classes pulled away from the two lower classes. Between 1992 and 2000 upper income groups became more segregated from the middle class as well. This occurred as upper income groups developed or expanded communities in La Herradura, along the coast, and in Peñuelas. Again, public transit is limited in these areas due to low housing density. However, private automobiles make this of minimal concern to residents.

Increasing automobile ownership rates in La Serena-Coquimbo have contributed to increases in sociospatial segregation. This can be linked directly to neoliberalism in two ways. First, expansion of the export economy has led to higher incomes in the IV Region, and specifically in the regional control center of La Serena-Coquimbo. Second, neoliberalism has resulted in lower taxes and tariffs on automobiles, therefore reducing their cost. Higher incomes and lower prices mean that more people own cars. In the past, while people may have wanted to live further from the lower classes, transportation limitations restricted the distances in which they could separate themselves. With more private cars, the rich, and increasingly middle classes, can purchase housing in more distant, homogenous, suburban locations. This transformation indicates a shift in urban form from that of the Griffin and Ford (1980) model, to one more along the lines of North America, and helps explain patterns seen in later morphological models (Ford, 1996; Arreola and Curtis, 1993).
D. Infrastructure.

We have seen that people in La Serena have differing abilities to pay for housing—with the upper classes seeking areas of high amenities. We have also seen that the automobile is increasing residential mobility. This allows the upper and middle classes to seek amenities in more distant, and socially homogenous, housing developments. Both of these factors are tied to neoliberalism and contribute to increasing sociospatial segregation. Both of these issues deal with housing demand, but nothing to this point has been said about housing supply. People could not buy in high amenity, suburban, auto-oriented communities if developers were not building them.

The role of infrastructure in the expansion of La Serena-Coquimbo can be seen in two important services—water and electricity. The electricity industry in Chile has been privatized as part of neoliberal reforms (Estache, 1998). The water industry has not been fully privatized, but has been re-structured with business-like financing and efficiency incentives (Shirley et al., 2000). These changes have allowed greater expansion of services and contributed to sociospatial segregation.

The Chilean electrical industry underwent reforms in the early 1980s, as price controls, service rationing, overstaffing, and large deficits conflicted with the government’s neoliberal strategy (Estache and Rodriguez, 1998). Two public electricity companies, ENDESA and Chillectra, were divided into 17 companies, some of which generated electricity and some of which distributed it. In 1986
the Empresa Eléctrica de Coquimbo (EMEC), which serves La Serena-Coquimbo, split from ENDESA and became a privately owned company (EMEC, 2002). EMEC, as with all private electricity companies in Chile, operates through private capital, such as pension fund investments, and customer usage fees (Rudnick, 1994).

Electrical coverage in La Serena-Coquimbo was already high prior to privatization. In 1982, over 92% of households had electricity (although the 1982 census does not indicate if electricity was from legal public lines or another source) (INE, 1982). In 1992, after privatization, over 96% of households were connected to the public network (INE, 1992). By 1998, 99.5% of the households in La Serena and 98.3% of households in Coquimbo had metered connections to public lines (INE, 2000b). While the data for each time period measure slightly different things, a general pattern of increasing connections, nearly all fully metered and legal, can be seen.

While the use of counterfactuals, or "what if," scenarios are difficult to prove, many researchers agree that privatization has increased efficiency and allowed for greater coverage than if electricity had remained under state control (Paredes, 2001). Nationally, deregulation and privatization have led to greater coverage, kept up with increased consumption, reduced energy losses, and increased labor productivity (Estache and Rodríguez, 1998). Reasonable profits have ensured that private investment flows into the electricity industry (Rudnick, 1994).
While coverage was relatively good in La Serena-Coquimbo in 1982, privatization has allowed electricity to be extended to more distant and suburban locations than would have been possible under ISI. This is because, before privatization, new customers were a liability. The state had to use limited resources to build and maintain electrical systems and customers did not pay the full cost of services. With a private electricity market, new customers represent greater income for companies such as EMEC.

By law, EMEC is required to provide connections to new customers within 500 meters of existing power lines (Morales, 2002). Beyond 500 meters EMEC can make new customers pay all or part of the cost of building new transmission lines. Single users beyond 500 meters may have to pay full costs, however, EMEC typically pays for power lines to new subdivisions beyond 500 meters. This is because the company will make money off new connections. Customers now either pay full price for electricity, or, for low-income residents, it is subsidized by the state. In either case, EMEC receives full value for the electricity that it sells. As with any private business, the more customers a company has, the more money it will make.

As a private company, EMEC can build new power transmission lines further from the urban core. This is because from a business standpoint, new transmission lines are developed at lower costs (through increased efficiency and labor productivity) and provide greater benefits (through the acquisition of additional metered customers). Due to neoliberal changes in the electricity
industry, the supply of new housing can now fill the demand for high-amenity suburban locations. This explains how non-contiguous upper and middle-income communities are developing in La Serena-Coquimbo.

Reform of the water industry has been less dramatic than that of the electricity industry, but its effect on urban expansion is similar. As discussed in Chapter 3, the Chilean water industry was not completely privatized (Shirley et al., 2000). Instead, it was reformed along the lines of a private concession, with liberalization of tariffs, and efficiency incentives, such as profit sharing for managers and staff. An important change in tariff policy in 1990 allowed companies to charge for not only operating costs, but also investment costs for expansion (Paredes, 2001). The cost to consumers has increased as a result, but subsidies targeted at low-income households have offset the impact on vulnerable segments of the population (Shirley et al., 2000).

These incentives have allowed water companies to keep pace with the demand for new housing. As with electricity, the majority of urban households were legally connected to state operated water networks in 1982. In 1982, 96.2% were connected in La Serena, and 93.8% were connected in Coquimbo (Table 6.7). Reforms in state water policy led to the creation of a local, state-controlled water company, ESSCO, in the IV Region in 1990 (www.essco.cl). As a result of the reforms mentioned above, ESSCO has been able to continuously increase the number of households connected to the public system, despite the rapid growth that has occurred in La Serena-Coquimbo in recent years. As seen in
Table 6.7, roughly 99% of households were connected to the public system by 1998.


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<tr>
<td>La Serena</td>
<td>96.2</td>
<td>97.6</td>
<td>99.3</td>
</tr>
<tr>
<td>Coquimbo</td>
<td>93.8</td>
<td>96.8</td>
<td>99.0</td>
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(INE, 1982; INE, 1992; MIDEPLAN, 1998)

While no research has looked specifically at the impact of reforms on ESSCO, Shirley (2000) found that reforms to Santiago’s water company, EMOS, did lead to benefits such as greater investment and more connections. Since both EMOS and ESSCO operate under the same regulatory framework, it is reasonable to assume that residents of La Serena-Coquimbo benefited in a similar way with ESSCO.

It should also be noted that road infrastructure can influence urban expansion as well. However, in La Serena-Coquimbo this has not been a significant factor. Air photos from 1978 indicate that the road network is largely unchanged. New communities in areas such as Sindempart, Peñuelas, San Joaquin, and El Milagro all lie adjacent to roads that have existed at least since 1978. While some of the roads may have been dirt rather than paved, the basic network was already developed. Land developers are required to provide paved streets within their projects (Gobierno de Chile, 1975), but the existing feeder road network has proven sufficient to accommodate new development.
The only sector that has developed along with a major expansion of the road network is the Avenida del Mar. In this case the road was built as an economic development project to facilitate expansion of high-end oceanfront condominiums and hotels for tourists.

This section has illustrated how neoliberal reforms in Chile’s electrical and water industries has affected the supply of housing in La Serena-Coquimbo. Through privatization or privatization inspired reforms, EMEC and ESSCO have been able to provide essential infrastructure for new housing developments. Infrastructure has kept pace with housing development and, most importantly, has helped facilitate development in new high-amenity communities further from the traditional urban core. Without changes in EMEC and ESSCO it would have been more difficult to spatially extend services to the same degree.

E. Land Use/Land Markets.

Changes in land use and land markets in La Serena-Coquimbo have played a role in the evolution of urban form and sociospatial segregation. While the difference between ISI and neoliberalist policies may not be as distinct as in other sections of this chapter, the role of land use and land markets plays an important role in urban development and form.

One of the earliest urban plans in La Serena-Coquimbo was the Plan Serena (Véliz, 1995). Within the urban area of La Serena-Coquimbo the Plan Serena, finalized in 1952, was intended to enhance the colonial architectural style
of the core of La Serena, develop agricultural land along the coast, and create a single functional urban unit between La Serena and Coquimbo. The plan revitalized downtown La Serena by encouraging construction and renovation. Likewise, coastal land between the bay and the Pan-American Highway was turned to agricultural uses. The port of Coquimbo was also rehabilitated during this time.

Urban development, guided through the 1950s by the Plan Serena, set patterns of sociospatial segregation that can be seen on the 1982 social class map (Figure 5.6). As investment money rehabilitated downtown La Serena, upper and middle-income groups settled nearby to the south (Vélez, 1995). Illegal squatter settlements formed outside of the focal points of the plan. In La Serena, this was the area of Las Compañías, across the Elqui River north of downtown. Other poor communities could be found to the east of downtown and further south of upper and middle-income communities. These developed as low-income state housing (Antena) and a mixture of state and private low-income housing (around Cuatro Esquinas).

In Coquimbo, squatters settled in the hills above downtown (Parte Alta)—an area close to commerce and the port, but with topography that made accessibility difficult (Vélez, 1994). Squatters also settled in Tierras Blancas, a then isolated mesa between La Serena and Coquimbo. Other low-income groups lived in state housing in such areas as San Juan. Upper income groups were
more limited in Coquimbo, however a mixture of middle- and working-class housing developed in El Llano.

The Plan Serena contributed to the relative sociospatial segregation in La Serena seen in 1982. The central city and surrounding areas remained highly desirable, which ensured that land values and housing were more expensive than peripheral parts of the city. Squatters settled north across the river, well away from downtown, while legal low-income housing was built further to the east and south. It is more difficult to show that the Plan Serena led to sociospatial segregation in Coquimbo. The Plan rejuvenated the port, and Coquimbo’s character has remained that of a port city—generally dominated by lower to middle income residents. Upper-income households were not plentiful enough to form distinct enclaves. Low-income housing developed throughout the city, with large communities on the hills above downtown and San Juan-- patterns that are evident throughout the study period of this research.

Urban form of both La Serena and Coquimbo are also heavily influenced by their separate planes reguladores. These plans allow market forces to guide urban development, but within a controlled framework. Unlike other factors examined in this paper, this does not represent a radical change between ISI and neoliberalism, however it is useful to examine how the plans contribute to sociospatial segregation.

The plans appear to be adhered to relatively well, unlike plans in many less-developed countries. Squatter settlements are basically non-existent.
Legally built state projects have largely kept up with demand for low-income housing. The handful of squatter homes scattered throughout the urban area are not allowed to expand into large communities and residents are usually moved into public housing as soon as possible. This contributes to sociospatial segregation in that squatters cannot locate in “interstices” within higher-income communities. Governments prior to 1973 tolerated squatters to a much greater degree than after neoliberalist policies were implemented, because the latter place a strong value on private property rights.

Instead of developing squatter communities, low-income housing is channeled into certain sectors of the city. The location of these communities is based on land market values, which are partially influenced by the Plan Regulador. Low-income housing in La Serena has followed the patterns established in the 1950s. Most low-income housing is located in Las Compañías and Antena. Land values in these areas are lower due to the presence of low-income housing, distance from the urban core, and the lack of desirable amenities (i.e. a beachfront location). The Plan Regulador contributes to the continued development of low-income housing in these areas by allowing higher housing densities than in upper-income sectors of the city. For example, much of the undeveloped land in Las Compañías is zoned for a density of 500 people per hectare (Municipalidad de La Serena, 2000). In much of undeveloped Antena, the maximum density is 1200 people per hectare. These can be contrasted with maximum densities of 170 people per hectare for undeveloped land near higher-
income areas, such as Barrio Universitario and El Milagro. Lower densities make the development of low-income housing economically impossible. The return on sale of limited low-income units would not cover the cost of land. In this way, La Serena’s Plan Regulador perpetuates the development of segregated communities.

Higher densities are also allowed along the coast, but extremely high land values ensure that only luxury condominiums and apartments are built there. Two lower-income fishing communities are located in this area, one just north of the Elqui River and one in Peñuelas. These areas were once isolated fishing communities but are now centrally located in La Serena-Coquimbo’s expanding oceanfront development. With increasing values of coastal land, these communities may be replaced by new upper-income housing—leading to further sociospatial segregation.

La Serena’s plan will further contribute to sociospatial segregation on the extreme north side of the bay. A new industrial complex is planned, but housing is going to be restricted to high-end development—including a new golf-oriented community, further development along the coast, and very low-density (2.5 people per hectare) housing (Municipalidad de La Serena, 2000).

The Plan Regulador of Coquimbo also influences where housing for different social classes can be built. For example, in the high-income sector of Peñuelas the maximum densities range from 3 to 32 people per hectare (Municipalidad de Coquimbo, 1991). Lower income housing near the highway
in La Cantera, on the other hand, allows densities of 500 to 600 people per hectare (Municipalidad de Coquimbo, 1996). Coquimbo is currently revising its Plan Regulador. It will have to be seen to what degree it contributes to sociospatial segregation.

Land use regulations and land markets are closely intertwined in La Serena-Coquimbo. In general, housing is developed based on the market value of land. Land is more expensive if there are amenities (such as access to the beach, views, etc.) and if nearby communities are higher-income. Land is less expensive when there are no special amenities and nearby communities are lower-income. The planes reguladores influence land value by establishing maximum densities. Lower densities make low-income housing uneconomical. Land use patterns set in the 1950s have largely continued to the present, as the market value of land, and state regulations, focus lower-income housing in certain parts of the city and upper-income housing in others. The primary difference since implementation of neoliberalism is that people can now purchase housing in more suburban locations than under ISI (due to all of the factors presented in this chapter). Land values have increased in new areas with high amenities and remained much lower in less desirable areas. Market forces drive the expansion of the city, which, in combination with land use regulations, leads to greater sociospatial segregation.
F. Housing.

Chile's shift to neoliberal housing policy occurred in 1977 (MINVU, 1978), so it is useful to examine housing in La Serena-Coquimbo before and after this time period. Housing in La Serena-Coquimbo developed under ISI through a mixture of private, union/employer, state, and squatter developments (Véliz, 1995). In La Serena, private housing was built in upper-middle income areas south of downtown along Cisternas Avenue, and as individual farm homes to the south. Unions/employers, such as the mining companies, developed middle-class housing south of downtown, near private housing. The vast majority of state housing was built to the south, further from downtown and east in Antena (Figure 6.5)². An exception was a state project that was built directly in downtown in 1974. Formal housing built by the private sector, unions/employers, and the state could not keep up with demand. This led to the development of squatter settlements in Las Compañías.

In Coquimbo, the same actors were involved in housing development. Private housing was built close to downtown in El Llano and Sindempart (Véliz, 1995). A great deal of union/employer housing was also built in this area, as well as in Estación (the rail yard). State housing was mixed with private and union/employer housing in El Llano and Sindempart, and large projects were built in San Juan and Tierras Blancas (Figure 6.5). Again, formal housing could

² This map shows the location of public housing built between 1973 and 1998. The only data available prior to 1973 come from descriptions in Véliz (1995).
Figure 6.5. MINVU Housing 1973 to 1998.
not keep up with demand, leading to the development of squatter housing in the hills above downtown (Parte Alta) and Tierras Blancas.

There are several important points to note in relation to housing development under ISI in La Serena-Coquimbo. First, state housing played a moderate to minimal role in reducing sociospatial segregation. Only one state project was developed in downtown La Serena, while all others were developed in peripheral locations to the south and east. This tended to reinforce sociospatial segregation rather than reduce it—which helps to explain La Serena’s relative segregation in 1982. More state housing was mixed with private and union/employer housing in Coquimbo, specifically in the area of El Llano. This contributed to Coquimbo’s relative lack of sociospatial segregation in 1982.

Second, the presence of squatter settlements in La Serena and Coquimbo indicate that formal housing could not keep up with demand. Large settlements developed in Las Compañías, Tierras Blancas, and Parte Alta of Coquimbo. Las Compañías and Tierras Blancas were distant from the urban cores of La Serena and Coquimbo. While the Parte Alta of Coquimbo is not far from downtown, its topography limits accessibility. Squatter settlements did not develop within middle or upper class communities as in other Latin American cities. Rather, they remained well segregated from these groups. This segregation was evident in measurements of La Serena in 1982. Coquimbo had much less measured segregation in 1982, but these measurements did not account for topographic barriers.
In 1977, Chilean housing policy was dramatically revised, such that the private sector became the principal provider of housing and the state took a subsidiary role (MUNVU, 1989). Reforms were meant to stimulate both the supply and demand for formal housing (MINVU, 1978). Demand was stimulated through the creation of a mortgage system, which provided long term financing for homes, and through a variety of subsidy programs, targeted at a wide segment of the lower and middle-classes. Housing supply increased in response to demand and through state incentives. The provision of low-income housing was privatized, with private companies competing for state contracts. In addition, the state provided short-term loans to developers to cover initial expenses.

Housing for the majority of the lower and middle class in Chile is provided in one of three ways (MINVU, 1989). Low-income residents purchase housing developed through state initiated contracts. Through competitive bids, the state selects private companies to build low-income housing. A variety of programs exist, which are targeted toward the lowest-income segment of the population. Two of the most common programs are Progressive Housing and Basic Housing, which are financed through large state subsidies, individual’s savings, and a small mortgage (MINVU, 1996). Progressive Housing is aimed at the extremely poor. It consists of an urbanized site (electricity, water, sewers, and paved streets), and a 150 square foot bathroom and kitchen area. Residents add living space on their own or through financing from a second stage of the program. Basic Housing consists of an urbanized site with a 2-bedroom home of
410 to 450 square feet. These homes are designed so that additional living space can be added as well.

A second type of housing program is overseen by the state, but initiated by private or public organizations, such as unions, employers, or municipal governments. These homes are similar to Basic Housing, but are larger (430-540 square feet) and designed for people with slightly higher incomes. Finally, the Unified Subsidy serves the middle-class. This is a variable subsidy, based on the value of a home. The higher the value, the lower the subsidy. Due to changes in housing policy, nearly all housing in La Serena-Coquimbo has been privately built since 1977, although most with some form of state subsidy.

Housing policy has been relatively successful in stimulating supply to approximate demand, therefore reducing housing deficits. Table 6.8 shows that in 1982 there was an average of 4.8 people per housing unit in the comuna of La Serena. This fell to 3.4 people by 2002. Likewise there were 4.5 people per housing unit in the comuna of Coquimbo in 1982 and 3.2 in 2002. Reductions in the number of people per housing unit fell despite a rapidly growing population, which indicates that housing development has increased at a faster rate.

**Table 6.8. People per Housing Unit, 1982 to 2002.**

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<th>People per housing unit</th>
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<tbody>
<tr>
<td>La Serena</td>
<td>4.8</td>
</tr>
<tr>
<td>Coquimbo</td>
<td>4.5</td>
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(INE, 1982; INE, 2002)
Through privatization, the state can more efficiently produce housing. Competitive bidding by private companies allows costs to be kept under control. The use of private companies also means that the state does not have large payrolls to maintain when housing production slows. Increased production, along with the stimulation of demand through a wide range of lower and middle class subsidies and a private mortgage system, has reduced housing deficits. However, it has not solved the housing problem completely. In 1998, 1.6% of La Serena’s households were “overcrowded,” along with 4.2% of Coquimbo’s households (MIDEPLAN, 1999).

Privatization of housing has contributed to sociospatial segregation in several ways. First, an increase in formal housing production has decreased the need for squatter settlements. With programs such as Progressive Housing, a large proportion of even the poorest segments of society can purchase legal, formally built housing. The neoliberal state typically does not tolerate squatters, but in the case of Chile, production of state-assisted private housing has significantly reduced pressures to illegally squat land. Low-income groups now purchase small, yet formal housing (with intentions of adding to it later), rather than illegally taking land. In order for companies to win state contracts through low bids, and still make a profit, they must build on low-cost land. As described in the previous section, this means land in more peripheral parts of the city, such as Las Compañías in La Serena, and Tierras Blancas and San Juan in Coquimbo
(Figure 6.5). This contributes to sociospatial segregation by ensuring that low-income residents live in peripheral areas.

Secondly, the private housing market contributes to sociospatial segregation by changing where the middle-class lives. Whereas the middle class traditionally lived in mixed “accreting” communities (Griffin and Ford, 1980), they now purchase formally built housing in homogenous middle-class neighborhoods. The expanded private housing market has led to expansion of the city and the creation of homogenous communities. Private builders develop communities, such as the Barrio Universitario, where all housing is within a similar price range. This is a distinct change from the process of organic urban growth under ISI, as described by Griffin and Ford (1980). Large homogenous communities mean that one’s neighbors will be of the same social class. This increases sociospatial segregation.

The private housing market developed under neoliberalism in Chile has further contributed to sociospatial segregation. Land markets under this system drive where people live. The poor no longer illegally take land. Instead, they purchase formally built low-income housing, which for economic reasons must be located on the urban periphery. The middle and upper classes purchase homes in more desirable, yet still socially homogenous, housing developments. Processes that countered segregation under ISI, notably the squatting of land near upper-income communities, the development of some state housing in more
central and desirable locations, and the presence of middle-income groups in accreting neighborhoods, are now largely gone.

G. Access to Employment and Commerce.

In Chapter 5 it was shown how the lower two classes in La Serena have little spatial relationship with employment sites. No clustering occurs through 1992, and by 2000 there is only clustering at 3 kilometers or more. This illustrates a strong spatial mismatch between the residential location of the poor and employment sites. Referring to Figures 5.10, 5.12, and 5.14, it can be seen that businesses are largely concentrated in downtown La Serena and to the south. Over time, new employment nodes expanded along the Avenida del Mar (hotels, restaurants, etc.), but, otherwise, patterns have not changed significantly. The vast majority of new, low-income housing is being developed in Las Compañías, but employment opportunities appear to be very limited there. Residents of Las Compañías have to commute to jobs in other parts of the city, which disproportionately increases the burden of time and money. While low-income residents have more automobiles than in the past, rates of ownership are still very low, which forces them to rely on public transportation. Transfers between busses are not free in Chile, so if one has a long commute that requires the use of more than one line, costs can double or triple. This can become a significant part of a low income person’s wages. La Serena is still a relatively small city, where commutes of 3-4 kilometers are within reason, but if the poverty-employment
mismatch holds true in larger cities, such as Santiago, time and financial impacts could be much greater.

Access to employment in Coquimbo is relatively good for all social classes. As in La Serena, downtown Coquimbo has a large number of employment sites. A second node has been in the Tierras Blancas industrial park. With low-income groups near both of these centers, access to employment has not been as problematic. New employment growth has occurred in Peñuelas and La Herradura, but overall patterns have meant that the poor and middle-classes are not spatially separated. Only the upper-class had lost clustering with employment by 2000. However, this group has private automobiles, which increases accessibility dramatically.

La Serena has been more socially segregated than Coquimbo, and this pattern continues in relation to employment sites. A new industrial park is planned for the far north end of the bay (Municipalidad de La Serena, 2000), but nearby housing will be exclusively for upper-income groups. This indicates that patterns of segregation in employment are not likely to change. In Coquimbo, new low-income communities are forming around Tierras Blancas and south of San Juan. Low-income residents of Tierras Blancas will have good access to jobs if industrial development grows at a reasonable pace. Those south of San Juan will face longer commutes to employment sites unless new jobs are created nearby. Thus, we may see an increase in segregation between low-income residents and employment sites in Coquimbo’s future.
Spatial inequality in La Serena is also found in relation to commerce. As illustrated in Table 5.7, the mean distance to a major commercial center (downtown, major grocery stores, the mall) has increased for all social classes between 1982 and 2000. Major grocery stores, as well as the mall, are located in or near downtown La Serena. These areas have positive site characteristics of central accessibility, more dense populations, and moderate incomes. The two lowest income groups live at a mean distance of more than two kilometers from a major commercial area. The same holds true for the upper class, however private automobiles reduce the significance of distance. As with employment, major commercial developments have not followed low-income development in Las Compañías. This means that people have to commute to major commercial areas or pay higher prices for goods from small community markets.

For low-income groups in Coquimbo, access to major commercial centers has improved over time. This is primarily due to the development of a new major supermarket in Tierras Blancas—a large sector of low-income housing. Upper-income groups now live further from major commercial areas in Coquimbo. Again, this is less of a concern due to private automobiles.

A couple of factors mitigate poor access for lower-income residents throughout La Serena-Coquimbo. First, "ferias," or farmer's markets sell fruits and vegetables one or two days a week in many locations. Farmer's markets

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3 While Las Compañías does have a small-scale version of a major supermarket (Deca), it was not included in the analysis due to its limited size and selection of goods.
have very good selections and very good prices, which reduce the need to travel to major grocery stores\textsuperscript{4}. Second, a major supermarket/retail store ("Lider"--along the lines of Wal-Mart) in La Serena provides free shuttle service from communities throughout La Serena and Coquimbo. This indicates that businesses are aware of accessibility problems and are trying to reach customers in distant communities.

**H. Conclusion.**

This chapter has shown how changes in a wide range of policies and processes under neoliberalism have directly impacted the urban form of La Serena-Coquimbo. Intentionally or unintentionally, changes in income distribution, transportation, infrastructure development, land use/markets, and housing have led to increased sociospatial segregation. High levels of income inequality have resulted in vast differences in the ability of upper and lower classes to bid for land and housing. The upper classes search for housing in high-amenity areas, while lower classes are left with less desirable locations. Changes in transportation now allow a larger segment of the upper and middle classes to seek housing in high-amenity suburban locations. This is because neoliberal policies have reduced the price of private automobiles, making them

\textsuperscript{4} A newspaper article published while conducting field research described how low-income children bring healthier snacks to school than their upper-income counterparts. This is because fruits, frequently purchased in farmer’s markets, are much cheaper than pre-packaged snacks from supermarkets.
more accessible to a wider segment of the population. Automobile ownership allows for greater spatial mobility than in the past.

The supply of housing, especially in new suburban locations, has increased due to changes in infrastructure development, land use/markets, and housing policies. The privatization of infrastructure, such as water and electricity, has led to the spatial expansion of services. Connections to new customers now represent larger incomes for companies, not additional subsidies as in the past. This gives private companies an incentive to build infrastructure where demand for housing is high—suburban, high-amenity communities. Neoliberalism favors free land markets, in which land is legally owned by individuals, and use is determined by market forces. As La Serena-Coquimbo expands (due to all of the factors in this chapter) people sort themselves based on their ability to pay for land and housing. This separation is enhanced through planes reguladores, which through density allowances and zoning, channel development of upper and lower income housing into different areas. Finally, housing reforms have led to the expansion of homogenous formally built communities. The private development of state-sponsored housing, combined with a private mortgage finance systems and subsidies has led to strong growth in housing. This has led to the development of large, homogenous, communities, where all homes fall within a narrow price range.

All of these factors have contributed to expansion of La Serena-Coquimbo and increases in sociospatial segregation. New developments tend to
be larger and more homogenous than organic development under ISI. New communities are more spatially separated and homogenous than in the past.

The development of employment sites and commerce has not followed all social groups equally. In La Serena, lower income groups are more isolated from both. This means that they must spend larger amounts of time and money to reach their jobs and make purchases. This is less of a problem in Coquimbo, where lower-classes still live relatively close to employment and major commercial areas.
Chapter 7

Conclusion

A. Introduction.

This chapter will provide a summary of how the research questions in Chapter 1 have been answered, the implications of this research for the discipline of geography, and if the results can be generalized to other Latin American cities. In closing, it will discuss areas of future research and final comments.

B. Answers to Research Questions.

Chapter one of this project listed three goals, which were intended to guide investigation of neoliberal economic reforms and sociospatial segregation in Latin America. Chapters 2 through 6 presented theoretical and empirical evidence that answer these questions, with a specific focus on the Chilean city of La Serena-Coquimbo.

Goal 1. To determine how changes in economic policy create changes in urban form.

The specific problem presented in this goal was to determine if neoliberal economic reforms lead to greater sociospatial segregation than ISI. First, evidence from the literature suggested that in many cases (although not all) sociospatial segregation did increase in Latin American cities during the late 20th century—around the same time that neoliberalism took hold region-wide. Next,
it was shown that neoliberalism has altered five key variables that shape urban form—income equality, transportation, infrastructure, land use/land markets, and housing policy. Changes in these five variables enable cities to expand in ways that differ significantly from urban expansion under ISI, and have contributed to increased sociospatial segregation.

**Goal 2. To examine how neoliberal economic reforms have affected access to jobs and commerce by social class.**

To answer goal number 2, it was argued that as sociospatial segregation increases under neoliberalism, access for the poor to areas of employment and commerce should decline. As cities expand, these functions follow upper and middle class sectors; frequently leaving the poor with longer commutes to jobs and adequate shopping facilities.

**Goal 3. To use a mid-size city to empirically test Goals 1 and 2.**

Goals number one and two were tested on the medium size twin city of La Serena-Coquimbo, Chile. In order to measure if sociospatial segregation increased over time, maps were made of social class for the time periods of 1982, 1992, and 2000. Social class was mapped for these time periods using both visual and statistical data. Likewise, employment and commercial centers were mapped, using field observation, air photos, and telephone directories. Once social class was mapped, bivariate Riply’s K(d) was used to measure clustering between social classes. This analysis found that sociospatial segregation was increasing, although there were differences in the rate of increased segregation.
during different time periods and between La Serena and Coquimbo. Using Arcview Spatial Analyst, access to employment and services over time was also measured. Results of this analysis show that access by lower income groups generally decreased during the study period.

C. Contributions to the Geographic Literature.

The theoretical relationship between neoliberalism, urban form, and sociospatial segregation, as well as the case study of La Serena-Coquimbo, contribute to the geographic literature in three important ways. First, it explains why urban morphological models from the 1970s and 80s differ from those of the 1990s. Second, it provides a means of quantifying and measuring sociospatial segregation over time. And third, it contributes to the debate on the costs and benefits of neoliberal reforms in Latin America.

Latin American urban models developed in the 1990s show both upper and middle class communities on the periphery of the city. These are not present in models from the 1980s, which makes one wonder why these changes have occurred. Explanations are not given with models developed in the 1990s, and while they are useful from a descriptive standpoint, they leave a significant gap in their explanatory power. This research fills that gap by discussing the processes that changed under neoliberalism during the 1980s, which led to visible urban morphological changes in the 1990s. Specifically, changes in income inequality, transportation, infrastructure, land use/land markets, and
housing were shown to modify urban form. Key to this research, they have allowed development of socially homogenous suburban communities, which strongly contribute to socio-spatial segregation.

In addition to explaining Latin American urban morphology in the 1990s, this research offers a technique to empirically measure socio-spatial segregation. Many authors talk about segregation in Latin America, but rarely is it measured, either for single or multiple time periods. Anecdotal discussion of socio-spatial segregation can help illuminate Latin American urban issues, but without measuring changes, it is difficult to determine the magnitude of the problem. By mapping social class over time and using the bivariate Ripley’s K(d) to test for clustering between classes, increasing socio-spatial segregation was quantified. This allowed for analysis of the degree of change between three different time periods and between the two cities of La Serena and Coquimbo. Due to data limitations, assumptions had to be made when mapping social class that were not ideal, however, the general techniques developed in this work will lead to better opportunities for quantifying socio-spatial segregation in future research.

Finally, both the theoretical and empirical arguments presented in this research provide additional information to the debate over the costs and benefits of neoliberal reforms in Latin America. Neoliberalism is the dominant development paradigm at this point in time. It has strong supporters in institutions such as the World Bank and International Monetary Fund, as well as many Latin American governments. Yet there are many critics as well, both
within Latin American governments and other institutions, such as many labor unions and non-governmental organizations.

Proponents argue that neoliberalism allows individuals and businesses to creatively pursue economic growth, without the limitations previously placed on them by strong centralized governments. This leads to greater economic growth, which in turn, leads to reduced poverty, less income inequality, and a strong middle class. In urban areas, it also allows for efficient use of urban space, so that an adequate amount of residential, commercial, and industrial land is developed to support the population.

Critics of neoliberalism argue that economic growth, poverty, and income distributions become worse under this system. They state that cities become more segregated as "the rich get richer and the poor get poorer." Upper income groups can afford high-amenity sectors; while cuts in public housing programs and deregulation of land use force the poor to live in isolated communities, generally under-serviced and removed from those of upper-income groups.

Both proponents and opponents of neoliberalism can use this research to support their arguments. It shows that sociospatial segregation has increased in response to neoliberal reforms in La Serena-Coquimbo. Upper, middle, and lower income groups are living in increasingly separated communities. Access by the poor to employment and commerce has also declined, although commuting distances are still much lower than those of larger cities around the world. On the other hand, poverty has been reduced, and targeted government-
subsidized privately built housing and infrastructure have kept pace with a rapidly growing population. There are next to no squatter settlements in La Serena-Coquimbo and nearly the entire population has housing with running water and sewerage connections. Without neoliberal reforms, sociospatial segregation probably would not have increased to the same degree, but the quantity of housing and coverage of infrastructure would not have increased as much either.

Despite the conclusions presented in this paper, questions remain as to how widely the results apply to other Latin American cities. The remainder of this chapter will discuss the likelihood that other cities have responded to neoliberalism in the same way.

D. Implications for other Latin American Cities.

Chile shares many commonalities with other Latin American countries, which imply that results of this research should be applicable to other areas. For instance, Chile relies heavily on the export of unprocessed and semi-processed raw materials, such as minerals, forest products, agricultural products, and fish, making its economy susceptible to fluctuations in world markets. It has a long history of unequal land tenure, historically with a small rural elite and large number of poor rural workers. This has led to traditionally high levels of poverty and income inequality. Rapid urban growth in the 20th century led to processes of land squatting and in-situ accretion as the population of poor urban residents
grew faster than economic opportunities. Finally, import substitution industrialization was the dominant development paradigm in the post World War Two years, which was then followed by a shift to neoliberalism toward the end of the 20th century.

However, there are many ways in which Chile differs from other Latin American countries as well, which may limit generalizations of this research. It is ethnically homogenous, with only a small indigenous population. This has limited the impact of discrimination and concomitant challenges of indigenous poverty reduction that are seen in many other countries of the region. Chile was also the first to radically throw out ISI and replace it with neoliberalism. Neoliberalism began almost immediately in Chile in 1973, while most other Latin American countries made the switch in the early to mid 1980s. This has given Chile more time to fine tune and modify its policies.

Another important difference between Chile and its neighbors—potentially the most important I would argue—is that Chile has created neoliberal policies and institutions that are efficient and well functioning. Many countries pursue neoliberalism, but without a strong and efficient institutional framework, reforms fail to function as planned. The Chile Foreign Investment Committee (2003) offers numerous examples of how the country compares to others in the region and around the world. While this committee may be expected to be slightly biased, it uses data from well-respected organizations. Chile consistently ranks as the least corrupt in Latin America—within the range of the United States
and Germany. Corruption can siphon away a nation’s limited financial resources and place personal connections over fair and efficient allocation of contracts. With low levels of corruption, theft by government and business officials is limited, and when a state contract is given to a private company, it generally goes to the company with the best proposal. Chile also ranks number one in Latin America for “country competitiveness,” a composite score based on equal treatment for local and foreign investors, a low level of state interference in the economy, cost-competitive electricity and telephone service, a high quality of life, and low levels of central government indebtedness. Furthermore, Chile ranks number one in “business environment,” where it is reported to have macroeconomic stability and a strong policy record. Finally, in numerous investment risk indexes, Chile scores very high. All of the rankings discussed above indicate that Chile has not only made neoliberal reforms in name, but that they have created efficient policies that promote economic growth and fiscal responsibility. Too often, this does not occur in other Latin American countries.

With this said, we will now examine how each of the five variables discussed in this research may affect urban form and sociospatial segregation in other Latin American countries.

Income inequality is high throughout Latin America. Although it fell somewhat under ISI, it rose significantly in the late 1980s—due to the debt crisis and shocks related to implementation of neoliberal policies—and has remained high to the present. Given that people with more money can out-bid those with
less money for desirable housing, high income-inequality is likely to contribute to sociospatial segregation region-wide. This variable should remain constant throughout Latin America and affect cities in ways similar to those of La Serena-Coquimbo. Despite predictions by proponents of neoliberalism, there is no evidence that income distributions will improve in the near future. Currently, some Latin American leaders are questioning neoliberalism—realizing that reforms have not paid off for large segments of their country’s population. Potentially, there could be a return to greater state involvement, with attempts to improve income distributions. As seen under ISI, income inequality can be reduced somewhat through greater state involvement, however, it is unlikely that it would reduce income inequality in the long run.

The role of transportation, specifically the automobile, may vary between Latin American countries more than income inequality. The private automobile is what allows people to live in more distant-- and as has been argued, more segregated—communities. Rapid growth in automobile ownership rates in La Serena-Coquimbo is an important factor in determining its urban form. But automobile ownership rates can vary in other countries, based on specific public policies and economic growth. In Chile, dramatic reductions in automobile import taxes significantly reduced the price of cars. At the same time, rapid economic growth in the 1990s increased people’s incomes. Both lower auto prices and higher incomes meant that many more people could afford cars. The degree of tax reduction on imported autos can vary between countries. If
reductions are minimal, the price of a car will not fall significantly. Likewise, economic growth varies throughout the region. People referred to the “Chilean miracle” during the 1990s because its economy grew much more rapidly than other countries. Where economies have grown more slowly, people will not have the same incomes to purchase automobiles. Finally, some countries, such as Argentina, Mexico, and Brazil, had domestic automobile industries under ISI. In these cases, neoliberal reductions in import taxes would have less impact on the price of an average car. Economic growth would be a more important factor in automobile ownership.

While private automobiles allow people to live in more homogenous suburban communities, infrastructure development allows these communities to be built. Again, depending on the specific conditions of neoliberal reforms, the degree to which infrastructure development contributes to sociospatial segregation can vary. In La Serena-Coquimbo, reform and privatization of the water and electricity companies has resulted in greater efficiency and allowed them to extend services to peripheral locations. But neoliberal reforms do not guarantee greater efficiency. First, if a country privatizes infrastructure services in a corrupt or inefficient manner, it is less likely that the new companies will function well. This will limit their ability to extend services to the entire urban area. Chile has low levels of corruption and has created an institutional framework that encourages fair competition in infrastructure provision. This is not the case in many countries. Second, if there is not corresponding economic
growth, or a country cannot attract adequate foreign investment, privatized infrastructure companies will not have the capital to extend services. Strong economic growth and a positive investment climate has ensured that adequate funds are available for infrastructure in Chile, but this can vary significantly in other places. Finally, if there are not subsidies for low-income residents, companies may not extend services to poor communities. Chile cut general subsidies for water and electricity, and replaced them with targeted subsidies for the poor. These subsidies cover the expenses of service provision in low-income communities for infrastructure companies. Without subsidies for low-income residents, services may be limited in poor communities, therefore forcing them to live in over-crowded central locations or unserviced squatter communities.

Policies related to land use/land markets can also vary between Latin American countries, although most policies still result in sociospatial segregation. If urban growth is restricted directly, through growth boundaries, or indirectly, through such things as farm subsidies on the urban edge, land speculation will remain focused on the center. This will result in land use patterns seen in urban models from the 1980s. Upper income groups remain closer to the center and in limited high-income sectors, while the poor are forced to live, often illegally, on the periphery of the city. Segregation is mitigated somewhat in mixed-social class zones of accretion. Without limits on urban expansion, speculation may shift to new upper income suburban developments. The poor generally are forced to rent or purchase land where speculation does not
take place—typically in low amenity areas on opposite sides of the urban area. Again, there is sociospatial segregation, although with a different spatial form. While most Latin American cities use some form of zoning, levels of enforcement differ significantly. Zoning contributes to sociospatial segregation, as seen in La Serena-Coquimbo, by limiting the type and density of land use. In countries with weak zoning enforcement, the poor may be able to reduce segregation to some degree by illegally squatting in interstices and on land zoned for different purposes. As with income inequality, land use/land markets should lead to segregation region-wide. Depending on the degree and types of neoliberal land reforms, and the level of enforcement of zoning laws, this segregation can take different forms—with upper income groups concentrated near the center and limited sectors and the poor on the periphery, as in older urban models, or with upper income groups in new suburban communities and the poor on the other side of town, as seen in models from the 1990s.

The last factor that can affect sociospatial segregation in Latin American cities is housing policy. Chile has been very successful in creating a formal housing market for almost all segments of society. Through a strong mortgage credit system and subsidies, the middle class can purchase formally built housing in homogenous suburban communities. The poor, through larger subsidies as well as mortgage credit, also purchase homes on legal, fully serviced lots. A formal housing system strengthens the segregating impact of zoning and land markets, as discussed above. In other Latin American countries, formal housing
can still be limited. Weak financial systems can limit mortgage finance, and under funded or inefficient housing agencies cannot meet the demand for public housing. This can force the middle class to rely on "accretion" rather than the purchase of a fully built suburban home. It also forces the poor to illegally squat land. As shown above, this too can lead to reductions in sociospatial segregation.

There is one more potential limit in the applicability of this research to other Latin American cities--size. As discussed in Chapter 3, research on the large cities of São Paulo and Rio de Janeiro shows that sociospatial segregation has decreased in recent years. Peripheral land has upgraded to middle class. Due to the massive size of these cities, the poor are no longer able to settle further on the periphery, and have moved back into central city tenements. The rich still live in the center as well, but are also settling in fortified peripheral enclaves (where land is cheap enough to develop self-contained communities, with high-rise condominiums, recreation facilities, etc.) surrounded by lower income groups. It is likely that once a city becomes too large, different social classes will not be able to live in distant, segregated communities. Lower income groups must live within reasonable distance to areas of employment, such as shopping centers and employers of maids and gardeners. Rather than spend several hours a day on busses, they choose to live in more crowded, yet central, housing. Likewise, development of new luxury housing may take place in more peripheral areas, where land is already occupied by lower income groups, but cheaper than the central city. This seems to indicate that sociospatial segregation increases in
medium-size cities, such as La Serena-Coquimbo, where there is still adequate undeveloped land for people to build segregated communities, and transportation times for the poor do not force them to live in central, yet crowded housing.

E. Future Research.

Future research should examine the role that each of the five variables discussed in this paper play in other Latin American cities. A multi-nation investigation could also consider the role that urban size plays in sociospatial segregation. Detailed analysis of these variables in other cities could clarify the differing impacts of each variable. It could determine which is most significant in other cities and if other variables, not used in this research, also play a role in sociospatial segregation.

F. Final Comments.

Neoliberalism has radically transformed Latin American society in recent decades. It is the development paradigm favored by the largest international aid organizations and most Latin American governments. In the past couple of years, some Latin American leaders—such as Chavez in Venezuela, “Lula” in Brazil, and many Argentines—have begun questioning the effectiveness of neoliberalism, as benefits of economic growth have not materialized or have not reached large segments of the population. It will be interesting to see in what ways neoliberalism is transformed in years to come. With luck, the hard edges of
neoliberalism will be softened, so that economic efficiency can be maintained, but with a greater focus on helping the poor. This paper argues that Chile has done well in pursuing neoliberalism with a human face in the 1990s. While Chile has not reached levels of development found in the US or Western Europe, it has made dramatic improvements under neoliberalism. Hopefully other nations can modify their policies and have similar success in the future.

Changes in Latin American urban form can be explained by neoliberal policies. In the case of La Serena-Coquimbo, it has contributed to increased sociospatial segregation, but at the same time has ensured that nearly the entire population has housing, water, electricity, and sewerage. Chile needs to continue to work hard so that more than the physical necessities of its population are met. Employment and educational opportunities must reach those in low-income communities. The United States and Europe have too many communities where people are relatively well housed, but socially isolated from the benefits of society. The challenge for Chile and all of Latin American is to develop the economic and urban policies that create thriving, livable cities.
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Appendix A. Location Map: La Serena-Coquimbo, Chile

Courtesy of The General Libraries, The University of Texas at Austin.
(http://www.lib.utexas.edu/maps/chile.html)
Appendix B. Physical Features of La Serena-Coquimbo
Appendix D. Photos of La Serena-Coquimbo.

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