Arthur O'Sullivan

URBAN Economics

Ninth Edition

Mc Graw Hill Education

Urban Economics

NINTH EDITION

Arthur O'Sullivan
Department of Economics
Lewis & Clark College

Mc Graw Hill Education

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To Professor Ed Whitelaw, the most talented teacher I've ever known.
It has been almost 30 years since I've been in Ed's class, but whenever
I start thinking about how to teach some new material,
my first thought is "How would Ed present this material?"

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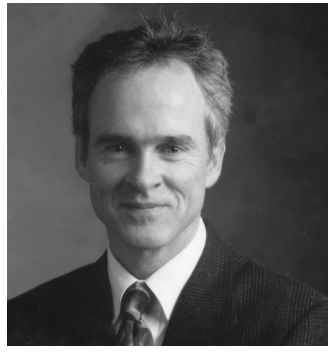
About the Author



ARTHUR O'SULLIVAN is a professor of Economics at Lewis and Clark College in Portland, Oregon. After receiving his B.S. degree in economics from the University of Oregon, he spent two years in the Peace Corps, working with city planners in the Philippines. He received his Ph.D. degree in economics from Princeton University in 1981 and taught at the University of California, Davis, and Oregon State University, winning teaching awards at both schools. He is the Robert B. Pamplin Junior Professor of Economics at Lewis and Clark College in Portland, Oregon, where he teaches microeconomics and urban economics. He is the coauthor of the introductory textbook, *Economics: Principles and Tools*, currently in its eighth edition.

Professor O'Sullivan's research explores economic issues concerning urban land use, environmental protection, and public policy. His articles appear in many economics journals, including *Journal of Urban Economics, Regional Science and Urban Economics, Journal of Environmental Economics and Management, National Tax Journal, Journal of Public Economics*, and *Journal of Law and Economics*.

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Preface

This book is designed for a course in urban economics, the discipline that lies at the intersection of geography and economics. Economics is the study of choice, exploring the decisions of optimizing households, firms, governments, and other organizations. Urban economics places these choices in a geographical context.

- A household chooses the utility-maximizing residential location.
- A firm chooses the profit-maximizing production site.

As we'll see throughout the book, the incorporation of locational concerns into models of optimization behavior provides important insights into the nature of cities and the causes of urban problems such as poverty, congestion, segregation, and crime. The geographical perspective also helps us evaluate the merits of alternative policies to address these urban problems.

The book is organized into five parts. Part I introduces the field of urban economics and reviews six key concepts of microeconomics that are used repeatedly throughout the book. Part II explores a variety of market forces that cause firms and people to cluster in cities of various size and scope. Part III looks at the spatial organization of cities, exploring the economic and public-policy forces that determine the spatial distribution of activity within cities. Part IV explores the two components of the urban transportation system—cars and roads, and public transit. Part V looks at local government, exploring the rationale for local government in a federal system of government, and taking a closer look at two particular public goods—education and public safety.

The text is designed for use in undergraduate courses in urban economics and urban affairs. It could also be used for graduate courses in urban planning, public policy, and public administration. All of the economic concepts used in the book are covered in the typical intermediate microeconomics course. For readers whose exposure to microeconomics is limited to an introductory course—or readers could benefit from a review of microeconomics concepts—Chapter 24 ("Models of Microeconomics") provides a review of the key concepts developed in an intermediate course.

CHANGES FOR THE 9TH EDITION

The text has been thoroughly revised to provide a clear and concise presentation of the field of urban economics. While the overall sequence of topics in the book has not changed, the changes in individual chapters are substantial and too numerous to list. The best way to get a sense of the changes is to consult the Table of Contents.

WEB SITE

The web site for the book www.mhhe.com/osullivan9e has color versions of the maps in the book, PowerPoint presentations, and lecture notes.

Acknowledgments

I am indebted to many people who read the book and suggested ways to improve the coverage and the exposition. In particular I would like to thank those instructors who participated in surveys and reviews that were indispensable in the development of the Ninth Edition of *Urban Economics*. The appearance of their names does not necessarily constitute their endorsement of the text or its methodology.

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PART ONE

Introduction and Key Concepts

The first two chapters set the stage for later chapters. Chapter 1 provides an overview of the field of urban economics and explains the organization of the book. The chapter also discusses various geographical definitions developed by the U.S. Census Bureau, including urban area, metropolitan area, and principal city. Chapter 2 reviews six key concepts of urban economics, five of which will be familiar to students who have completed a course in intermediate microeconomics. These concepts will reappear throughout the book.

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CHAPTER 1

Introduction

Cities have always been the fireplaces of civilization, whence light and heat radiated out into the dark.

—Theodore Parker

I'd rather wake up in the middle of nowhere than in any city on earth.

—Steve McQueen

This book explores the economics of cities and urban problems. The quotes above from Parker and McQueen reflect our mixed feelings about cities. On the positive side, cities facilitate innovation, production, and trade, so they increase our standard of living. On the negative side, cities can be crowded, noisy, and dirty. As we'll see in the first part of this book, firms and people locate in cities because the obvious costs are more than offset by the subtle benefits of producing and consuming in close proximity to other firms and people. As we'll see later in this book, policies that address urban problems such as congestion, pollution, and crime are likely to increase the vitality of cities, causing them to grow.

Urban economics is defined as the intersection of geography and economics. Economics explores the choices people make when resources are limited, while geography studies how various activities are arranged across space. Urban economics puts economics and geography together, exploring the location choices of utility-maximizing households and profit-maximizing firms. Urban economics also explores the causes and consequences of urban problems such as congestion, pollution, and crime and evaluates alternative policy responses to these problems. In addition, urban economics explores the efficiency and distributional effects of the policies of local governments, including municipalities and school districts.

1. URBAN ECONOMICS AND CITIES

Urban economics can be divided into four related areas, providing an organizational framework for this book.

1. *Market forces in the development of cities.* The interurban location decisions of firms and households generate cities of different sizes and economic structures. We explore the issues of why cities exist, where they develop, and why cities vary in size and scope.

2. *Land use within cities.* The intraurban location decisions of firms and households generate urban land-use patterns. In modern cities, employment is spread throughout the metropolitan area, in sharp contrast to the highly centralized cities of just 100 years ago. We explore the economic forces behind the change from centralized to decentralized cities. We also use a model of neighborhood choice to explore the issue of segregation with respect to race, income, and educational level. Housing choices are linked to location choices because housing is immobile. We will discuss why housing is different from other products and how housing policies work.
3. *Urban transportation.* We explore some possible solutions to the urban congestion problem and look at the role of mass transit in the urban transportation system. One issue is whether a bus system is more efficient than a light-rail system or a heavy-rail system such as BART (San Francisco) or Metro (Washington).
4. *Local government, education, and crime.* Most large U.S. metropolitan areas have dozens of local governments, including municipalities, school districts, and special districts. This fragmented system of local government generates interesting locational choices for households and firms as well as complex policy interactions. The provision of public K–12 education (kindergarten through high school) is the responsibility of local governments. Local governments are also responsible for controlling crime.

An urban economist defines an urban area as a geographical area that contains a large number of people in a relatively small area. In other words, an urban area has a population density that is high relative to the density of the surrounding area. This definition accommodates urban areas of vastly different sizes, from a small town to a large metropolitan area. The definition is based on population density because an essential feature of an urban economy is frequent contact between different economic activities, which is feasible only if firms and households are concentrated in a relatively small area.

The U.S. Census Bureau has developed a variety of geographical definitions relevant to urban economics. Since much of the empirical work in urban economics is based on census data, a clear understanding of these definitions is important. Part 2 of this chapter provides the details of the census definitions. There are four key census definitions.

1. *Urban area.* A densely settled geographical area with a minimum population of 2,500 people and a minimum density of 500 people per square mile.
2. *Metropolitan area.* A core area with a substantial population nucleus, together with adjacent communities that are integrated, in an economic sense, with the core area. To qualify as a metropolitan area, the minimum population is 50,000 people. In 2010, there were 366 metropolitan statistical areas in the United States.
3. *Micropolitan area.* A smaller version of a metropolitan area with a concentration of 10,000 to 50,000 people. In 2010, there were 576 micropolitan statistical areas in the United States.

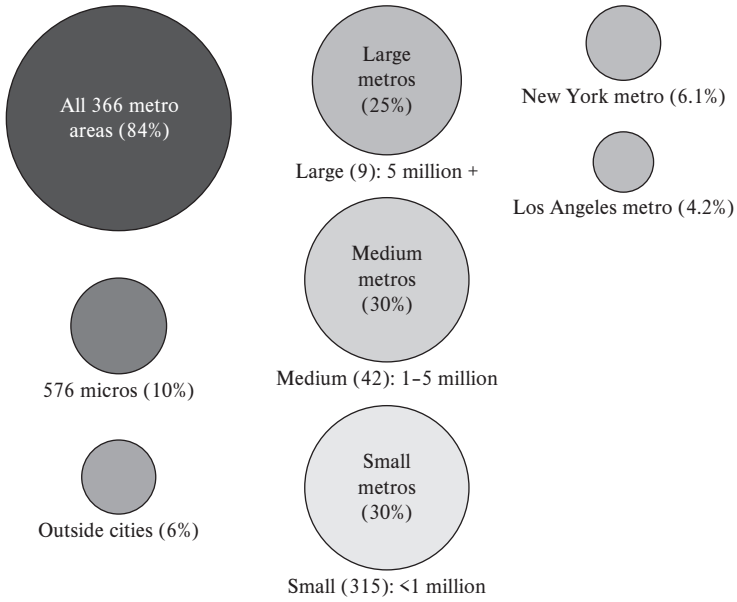
4. *Principal city.* The largest municipality in a particular metropolitan area or micropolitan area. A municipality is defined as an area over which a municipal corporation exercises political authority and provides local government services such as sewage service, crime protection, and fire protection.

This book uses three terms to refer to spatial concentrations of economic activity: *urban area, metropolitan area,* and *city*. These three terms, which will be used interchangeably, refer to the economic city (an area with a relatively high population density that contains a set of closely related activities), not the political city. When referring to a political city, we use the term *municipality*.

Figure 1–1 shows the shares of U.S. population in cities of various size. Overall, about 94 percent of the population lives in urban areas, with 84 percent in 366 metropolitan areas and 10 percent in 576 micropolitan areas. Roughly one quarter of the population lives in the largest metropolitan areas, defined as metropolitan areas with at least 5 million residents, leaving 30 percent in medium metropolitan areas and 30 percent in small metropolitan areas. Together the two largest metropolitan areas, New York and Los Angeles, have over 10 percent of the U.S. population.

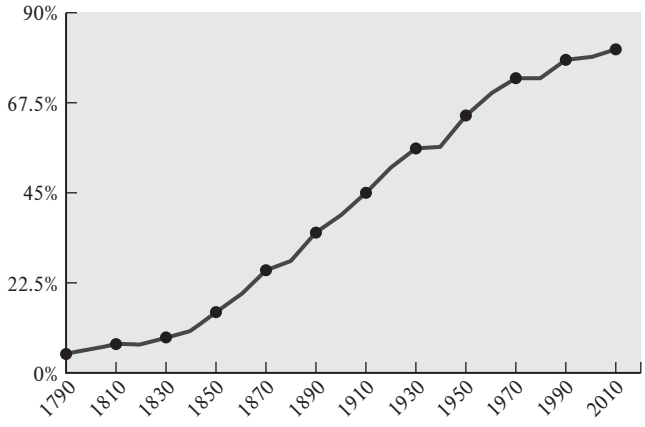
Figure 1–2 shows the share of people living in urban areas in the United States from 1790 to 2010. Over this period, the share of the population living in urban areas increased from 5 percent to 81 percent, a remarkable transformation that also

FIGURE 1–1 Proportions of U.S. Population by CBSA Status and Size Category



Source: Wilson, Steven et al., "U.S. Patterns of Metropolitan and Micropolitan Population Change: 2000–2010," U.S. Census Bureau, 2012.

FIGURE 1–2 Percent of U.S. Population in Urban Areas, 1790–2010



Source: U.S. Census, *United States Summary: 2010 Population and Housing Unit Counts, 2010 Census of Population and Housing,* 2012.

occurred in other parts of the world. Urbanization was nearly stagnant during the 1930s, the decade associated with the Great Depression. Urbanization was also stagnant a few decades later in the 1970s, a decade that included a deep recession in 1973–1975. As we will see in the first part of the book, the transformation from a rural to an urban society occurred because (1) technological advances in production increased labor productivity in agriculture, manufacturing, and services; and (2) technological advances in transportation increased accessibility.

Figure 1–3 shows the time trends in urbanization for six major areas in the world. The historical data goes back to 1950 and the projections go to 2050. The vertical axis measures the proportion of the total population in urban areas. The proportions are currently less than half in Africa (40 percent) and Asia (47.5 percent), but that is expected to change by 2035 in Africa and 2018 in Asia. In the other areas, the urban percentage ranges from 70.8 percent in Oceania to 81.5 percent in Northern America.

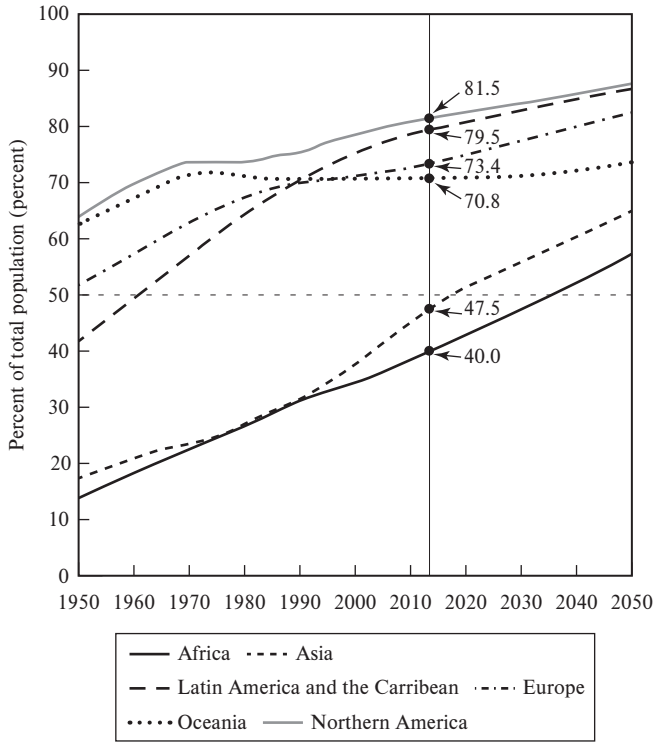
2. CENSUS DEFINITIONS

The U.S. Census Bureau has developed a variety of geographical definitions relevant to urban economics. Since much of the empirical work in urban economics is based on census data, a clear understanding of these definitions is important. This introduction provides the details of the census definitions.

Urban Population

The geographical definitions developed by the Census Bureau are based on the census block, the smallest geographical unit in census data. A census block is defined

FIGURE 1–3 Urban Population as Percentage of Population, 1950–2050



Source: United Nations, *World Urbanization Prospects, 2014,* New York: United Nations, 2016.

as an area bounded on all sides by visible features (streets, streams, or tracks) or invisible features (property lines or political boundaries). The typical census block has between a few dozen and a few hundred residents. A block group is a group of contiguous census blocks. A census tract is a contiguous set of census blocks. The target population range for a census tract is 4,000 residents. In 2010, there were more than 72,531 census tracts, with an average population of 4,256. Roughly 90 percent of the tracts had between 1,500 and 7,500 residents.

The Census Bureau uses tracts to define two types of urban areas. The urban population is defined as all people living in urbanized areas and urban clusters.

1. *Urbanized area.* An urbanized area is a densely settled core of census tracts and surrounding tracts that meet minimum population density requirements. In most cases, the density requirement is 1,000 people per square mile for the core block groups and 500 people per square mile for the surrounding blocks. Together, the densely settled tracts must encompass a population of at least 50,000 people. In 2010, there were 486 urbanized areas in the United States.

2. *Urban clusters.* An urban cluster is a scaled-down version of an urbanized area. The total population of the census tracts that make up an urban cluster is between 2,500 and 50,000 people. In 2010, there were 3,087 urban clusters in the United States. Based on the Census definition of the urban population, 81 percent of the U.S. population lived in urban areas in 2010.

Metropolitan Area aka Core-Based Statistical Area

The Census Bureau has a long history of changing its definitions of metropolitan areas. The general idea is that a metropolitan area includes a core area with a substantial population nucleus, together with adjacent communities that are integrated, in an economic sense, with the core area. Over the years, the labels for metropolitan areas have changed from standard metropolitan area (SMA) in 1949, to standard metropolitan statistical area (SMSA) in 1959, to metropolitan statistical area (MSA) in 1983, to metropolitan area (MA) in 1990, which referred collectively to metropolitan statistical areas (MSAs), consolidated metropolitan statistical areas (CMSAs—the largest metropolitan areas), and primary metropolitan statistical areas (PMSAs—parts of CMSAs).

The new label for areas considered metropolitan, implemented in 2000, is core-based statistical area (CBSA). Each CBSA contains at least one urban area (either an urbanized area or an urban cluster) with at least 10,000 people and is designated as either a metropolitan area or a micropolitan area.

1. *Metropolitan area.* A metropolitan statistical area includes at least one urbanized area with at least 50,000 people.
2. *Micropolitan area.* A micropolitan statistical area includes at least one urban cluster of between 10,000 and 50,000 people. In 2010, there were 366 metropolitan statistical areas and 576 micropolitan statistical areas in the United States.

The building blocks for metropolitan and micropolitan areas are counties. For a particular CBSA, central counties are ones in which at least 5,000 people or 50 percent of the population resides within urban areas with at least 10,000 people. Additional outlying counties are included in the CBSA if they meet minimum thresholds of commuting rates to or from the central counties. Specifically, at least 25 percent of workers in an outlying county must work in one of the central counties, or at least 25 percent of the jobs in an outlying county must be filled by residents of one of the central counties.

Together CBSAs contain 94 percent of the nation's population, with 84 percent in metropolitan areas and 10 percent in the smaller micropolitan areas. The percentage of the population in CBSAs (94 percent) exceeds the percentage in urban areas (81 percent) because CBSAs encompass entire counties, including areas outside urban areas (defined by the smallest geographical unit, the census block).

Principal City

The largest municipality in each metropolitan or micropolitan statistical area is designated a principal city. Additional cities qualify as "principal" if they meet minimum

requirements for population size (at least 250,000 people) and employment (at least 100,000 workers). The title of each metropolitan or micropolitan statistical area consists of the names of up to three of its principal cities and the name of each state into which the metropolitan or micropolitan statistical area extends. For example, the name for the Minneapolis metropolitan area is Minneapolis-St. Paul-Bloomington, MN-WI, indicating that it includes parts of two states with two other municipalities large enough to merit listing. For most metropolitan areas, the label includes only one principal city. About a dozen large metropolitan areas are divided into smaller groupings of counties called metropolitan divisions.

REFERENCES AND READING

1. U.S. Government. "Standards for Defining Metropolitan and Micropolitan Statistical Areas." *Federal Register* 65, no. 249 (December 17, 2000).