

Homer Hoyt: An Introduction

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Overview



Homer Hoyt¹ pioneered academic and practitioner real estate market analysis in the mid-20th century. Academics know him primarily for his sector theory of urban land development, and for his classic *100 Years of Land Values in Chicago*. Practitioners also know him for advances in applied analytics that came about from his consulting and appraisal services, including his use of economic base calculations as input measurements to estimate current and projected demand for commercial and residential real estate. Homer Hoyt innovated procedures for estimation of highest-and-best use of a site (a site looking for a use), and for analyzing location criteria for a real estate activity (a use looking for a site). A third legacy of Homer Hoyt is his contributions to the development of institutions important to land economics and real estate, including the Federal Housing Administration, and his endowment of the Homer Hoyt Institute. A fourth and the most enduring legacy of Homer Hoyt was his belief that academic and practitioner land economics and real estate market analysis be a balance of rigor and relevance. He promoted this belief to his university colleagues, to his practitioner peers, and in his own work. Homer Hoyt's legacy continues through his 1984 endowment of the Homer Hoyt Institute (HHI). Today, HHI sustains

¹ Photo credit: Michael Hoyt

Homer Hoyt's legacy by supporting land economics and real estate research, and providing educational forums for academics and high level practitioners in the field.

Early Life²

Homer Hoyt was born in St. Joseph, Missouri, to Elizabeth. His father died when Hoyt was a year old and hence was unknown to him. Wikipedia reports Hoyt was born in 1895, but in fact the exact year of Homer Hoyt's birth was not remembered by his mother. Two overriding characteristics can describe Homer Hoyt's youth: poverty; and Elizabeth Hoyt's drive and commitment that her son's cleverness combined with a good education would lift him out of poverty.

In his young years, Homer Hoyt lived with his mother in a tent on the eastern perimeter of Kansas City. As a first grader, he walked five miles to reach his classes. But later he was barred from the school because his mother's and his tent lay outside the city limits, and the closest school district refused to admit him. Unrelenting, Elizabeth homeschooled her child.

Elizabeth's persistence eventually paid off when Homer was admitted to Argentine High School at the then urban margin of Kansas City. He ranked first in his class at the end of his sophomore year. He then transferred to Wyandott High School in downtown Kansas City, from which he graduated in 1909. Elizabeth helped him pay the fifteen dollar a year tuition to attend the University of Kansas, from which he graduated in 1913 (A.B., A.M., Phi Beta Kappa) at the age of

² Here, and elsewhere, we draw heavily on an unpublished transcript of detailed interviews of Homer Hoyt carried out and kindly made available to us by his son Michael Hoyt. Robert Beauregard (2007) has written an excellent biographical note that we recommend to interested readers. Many of Homer Hoyt's writings can be found in a privately published compendium, *According to Hoyt: 53 Years of Homer Hoyt, 1916 to 1969 -- Articles on Law, Real Estate Cycles, Economic Base Sector Theory, Shopping Centers, Urban Growth*.

seventeen. His scholastic achievements won him a fellowship from the University of Chicago from which he earned a J.D. in 1918. In 1917 he accepted a position as an economics instructor at Beloit College in Wisconsin.

Early Career

Shortly after starting at Beloit, Homer Hoyt was pulled out of academic life and into public service to be an economist for the War Trade Board in Washington, D.C. This pattern of peripatetic employment would repeat throughout Homer Hoyt's adult life. Following the end of the war on November 11, 1918, Hoyt accepted a position as Professor of Economics at University of Delaware. Then in 1920 he was courted by the University of Michigan with a professorship in economics, which he declined, instead working as a statistician for the American Telephone and Telegraph Company in New York City. Bored at AT&T, Hoyt returned to academia at the University of North Carolina at Chapel Hill (1921-1923), and then the University of Missouri at Columbia (1924-1925).

In 1925, Homer Hoyt again left academia for the private sector and public service. Hoyt thrived as an independent scholar, unconstrained by university bureaucracy. Homer Hoyt became a real estate broker and consultant based in Chicago from 1925 to 1934, during which time he completed his Ph.D. in Economics at the University of Chicago (1933) and published his influential dissertation, the aforementioned *One Hundred Years of Land Values in Chicago: 1830-1933* (reprinted 1970). To this project we now turn.

One Hundred Years of Land Values in Chicago

Few dissertations are ever cited, still fewer are regularly cited 80 years later (e.g. by Shiller 2012, Glaeser 2013, among many). For his dissertation Hoyt undertook a massive pre-Internet, pre-computer data collection and analysis that not only resulted in his classic published dissertation, but gave him plenty of time to woo the reference librarian, who became his wife Gertrude.

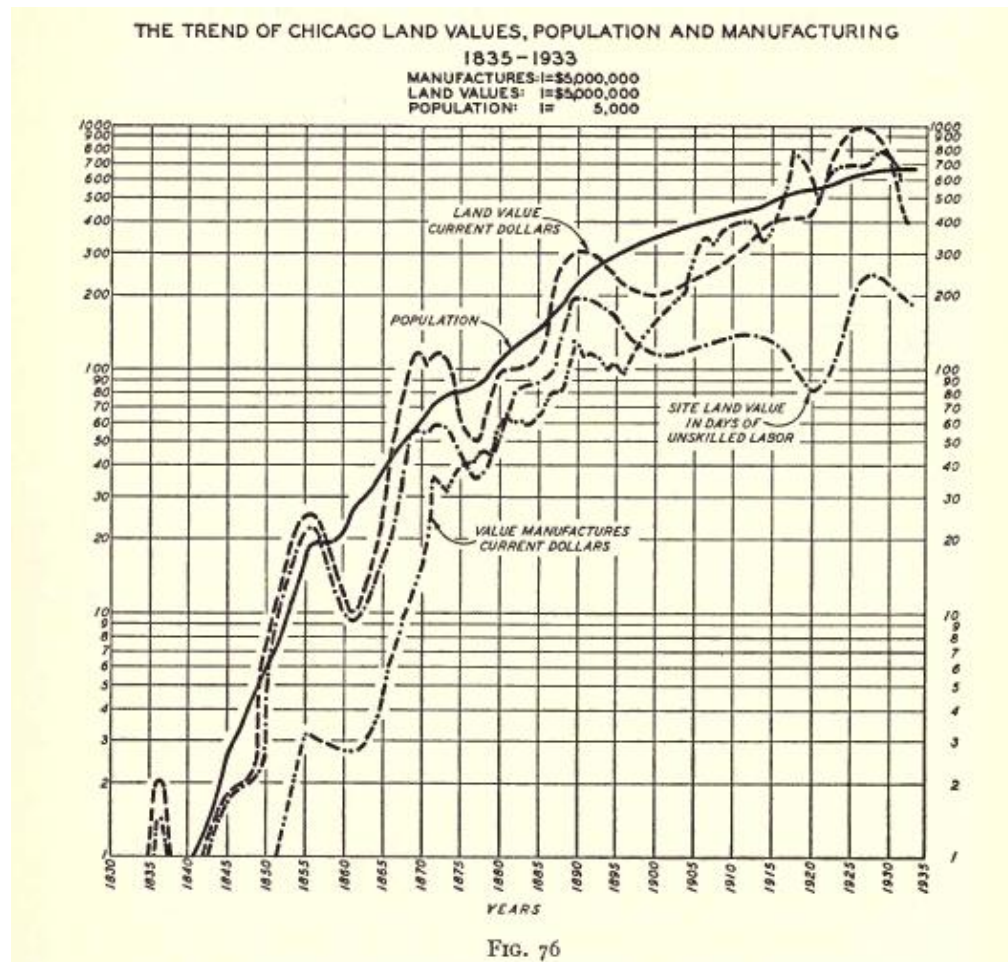


Exhibit 1³

³ Figure scanned from Hoyt (1933).

In the 19th century Chicago's growth was explosive, as discussed in many histories such as Miller 1996, and Cronon 1992. When Chicago was incorporated in 1833, its population was about 350. By 1840, it had increased by an order of magnitude, to 4,500. In 1848, two major infrastructure projects were completed. The Illinois and Michigan Canal opened, which provided a water route from the Mississippi to the Great Lakes (and hence to New York and the East Coast). The Galena and Chicago Union Railroad was Chicago's first rail line. Given Chicago's location at the very southern tip of the Great Lakes, Chicago eventually became the rail hub for much of the Midwest. In 1878, Gustavus Swift (of Swift Meats fame) and engineer Andrew Chase developed the refrigerated railroad car which, thanks in part to a steady supply of ice shipped south to Chicago from Lake Mendota and other Wisconsin lakes, permitted the safe and economical transport of dressed beef and pork from Midwestern farms to East Coast markets. Given these developments (and others detailed in Miller and in Cronon), Chicago's population exploded throughout the 19th century and the first half of the 20th century.

As noted above, after beginning a career as a real estate broker, Homer Hoyt became interested in analyzing Chicago's market more rigorously, and began the study for a PhD focusing on land research under Ernest Fisher at the University of Chicago. Over a period of several years, Hoyt carefully collected data on land price transactions throughout the city, collated, mapped, and analyzed them. The resulting product, his (1933) published dissertation "One Hundred Years of Land Value in Chicago," is rightfully celebrated as the most thorough and careful analysis of land prices of its time, and for some time thereafter; almost a century later, it's still a wonderful read.

Among many findings, Hoyt showed (1) that over the very long run, land values were driven by economic fundamentals, especially population growth; but that (2) there were somewhat irregular cycles, approximately 18 years in length according to his data, that caused land prices to deviate from the long run fundamental values for years at a time. [Notice that there's only the tiniest blip in the price data, and no discernible change in Chicago's employment, at the time of the 1871 fire!] The existence of cycles is taken as a commonplace now, although we still argue vociferously over their nature and causes. Hoyt's research laid the groundwork for the substantial body of work on land prices and real estate cycles today, e.g. by McMillen (1996), Davis and Heathcote (2007), Davis and Palumbo (2008). This and other research by Hoyt underpin an excellent review of the economic history of Chicago by John McDonald (2016). Hoyt's research is also repeatedly cited in Goldstein and Moses (1973) classic review of the early development of urban economics.

During this period Hoyt also collaborated with Arthur Weimer in writing *Principles of Urban Real Estate*, a standard text which survived six editions. Hoyt and Weimer were early proponents of the income approach to valuation of commercial property, and the application of present value analysis to cash flows, techniques which are ubiquitous and taken for granted today.

Chief Economist of the Federal Housing Administration

Before the 1930s and the Great Depression, residential mortgage funding was not as readily available as today, as Snowden (2013) and Green and Wachter (2005) document. Slightly over

40 percent of the nation's 30 million households were homeowners at the onset of the Depression, and about 40 percent of these had some form of mortgage. Most mortgages were for 50 percent of sales price or less, and had terms of 5 to at most 10 years, with no amortization. Building and Loans made some fully amortizing loans of over 50 percent LTVs, but these implied high payments that created their own problems when borrowers were stressed. Every 5 years or so many borrowers had to roll over the full amount of the mortgage, unless they had saved up enough funds separately to pay off some of the terminal balance.

In the Depression, unemployment rose, wages fell, and nominal house prices dropped. Mortgage defaults rose, in both urban and rural areas (Wheelock 2008). We haven't found a credible accurate estimate yet, but a ballpark estimate based on data in Wheelock and Snowden suggests that during the Depression something like 2 million of 5 million home mortgages defaulted.

As defaults threatened the financial system, to say nothing of households, the New Deal response was the creation of the Home Owners Loan Corporation (HOLC) in 1933. HOLC purchased defaulted mortgages from banks and rewrote them for the original borrowers. The new loans were converted to fixed rate long term (15 to 20 year) fully amortizing mortgages.

HOLC did not intend to hold these mortgages for the long run. To make the mortgages marketable, and to facilitate the winding up of the HOLC, investors required insurance that limited the risks from further defaults. Pre-Depression, private mortgage insurance (PMI) did exist but was not universally used; and the insurers were insufficiently capitalized to withstand Depression-era losses. So in 1936 the Federal Housing Administration (FHA) was created. It was here, the FHA, that Hoyt made his direct contribution.

In addition to their insurance function, FHA (and a little later the Veterans Administration) helped developed lending standards that reduced lenders' risk exposure, and further popularized what eventually became the 30-year, fixed rate, self-amortizing loans familiar to us today. Since the advent of widespread mortgage insurance – including a revived PMI sector as well as FHA and VA, lenders were then more willing to lend money at favorable rates with relatively small down payment requirements. LTVs of 95% or more became common for FHA and VA loans.

In the event, with FHA guarantees in place, HOLC was able to roll of their book of roughly 1 million mortgages to the private sector and put itself out of business by 1930. FHA, of course, continues to this day, guaranteeing a segment of private mortgage lending to low- and moderate-income households.

As Pinto (2014) and Miller and Markozyan (2003) discuss, between 1934 and 1940 Homer Hoyt was called to serve as a Principal Housing Economist at the Federal Housing Association under Ernest Fisher. During this period Hoyt also collaborated with Arthur Weimer in writing *Principles of Urban Real Estate*, a standard text which survived six editions. Hoyt and Weimer were early proponents of the income approach to valuation of commercial property, and the application a present value analysis to cash flows, techniques which are ubiquitous and taken for granted today.

As part of his work at FHA, Hoyt took his earlier work on the spatial distribution of housing markets much further, developing his “sector theory” of cities. He applied some of these theories to FHA's mortgage underwriting, including early (albeit not the first) use of maps in assessing housing market risks.

Hoyt's Sector Theory of Urban Land Use

Hoyt's Sector Model

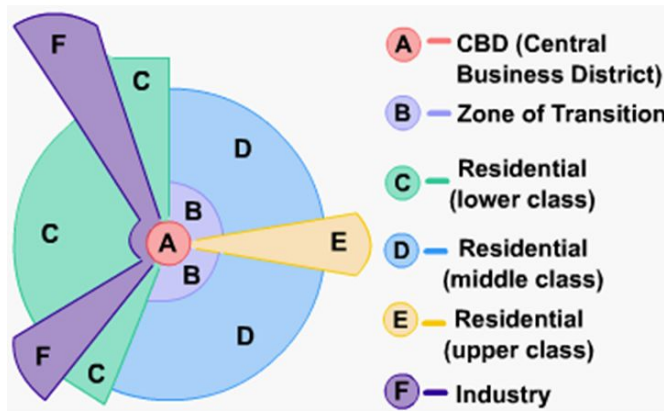


Exhibit 2⁴

Early stages of urban modeling (Ricardo 1819, von Thunen 1826, Burgess 1924) all analyzed land use and the city as a “featureless plain” (other than Ricardo’s consideration of differing fertility). Rivers, roads, etc. played no part. Especially important to Hoyt was the social status (geodemographics) of the residents of the various sectors, as well as the physical geography of the sector. Hoyt correlated high social status residential areas with higher elevations. Higher status housing sectors tended to arise among sectors offering unconstrained growth outward toward open uncongested spaces. In contrast, Hoyt observed that low income sectors were more likely to have comparatively lower elevations including flood plains, and unable to accommodate future development.

⁴ Colorized version of Hoyt’s model from AP Human Geography, <https://slideplayer.com/slide/6826301/>.

Hoyt noted that in industrial-era cities, while a central business district might be well, *central*, a lot of office, retail, etc., lots of manufacturing, wholesale warehousing, and so on, took place along a line – a river, or a railroad, or a major road. (Of course, there could be more than one). These activities often generated “negative externalities” (pollution). Their labor forces were largely working class, and poor; in the 19th century and early 20th, this meant you walked to work. So the “lower class” residences were located along a line near this line of employment. The “best” neighborhoods were located some distance from the factories, often upwind and, where topography supported it, on a hill, away from floods and mosquitoes, cooler in summer, etc.

Hoyt pioneered rigorous economic models to understand and explain market forces that create the spatial pattern of urban land use and urban land values. This understanding is a requirement for anticipating change in land values and land use, necessary for business decision making and urban planning. Hoyt’s pioneering work, including geodemographics and map overlays, have become accepted as best practices in contemporary real estate market analysis (Clapp, Rodriguez and Thrall 1997; Thrall 2002).

Hoyt’s sector theory proved useful in understanding the dynamics of urban growth, and was put to use by FHA, as we discuss in the next section. Sector theory also proved useful in the post-World War II U.S. The mid-20th century was a period of rapid suburban expansion; cities were being shaped by private decisions made on where to build housing tracts, and which socioeconomic group should the housing be targeted. Private decisions were also being made on where to develop regional shopping centers. Public decisions were being made on where to

build public infrastructure, such as streets and expressways. As a consultant, Hoyt's sector theory was put to good use in improving these private and public real estate decisions.

Hoyt's sector theory was developed in a series of papers and monographs; the best overview remains his 1939 FHA publication *The Structure and Growth of Residential Neighborhoods in American Cities*.

Homer Hoyt's application of sector theory and related analysis to FHA's lending lead to another set of innovations, as well as controversy over which variables were reliable, and legitimate, guides to mortgage risks; controversies which are still with us today, discussed next.

Applied Cartography, and "Redlining"

The Depression-era Home Owner's Loan Corporation (HOLC) and FHA, and Hoyt in particular, pioneered the use of maps to understand the spatial distribution of mortgage risks. These innovations including procedures known today by geographers as the map overlay, an innovation and practice typically credited to urban planner Ian McHarg, as discussed in Corbett (2008). However, McHarg's work was executed nearly 30 years after Hoyt used map overlays in his dissertation, and long after Hoyt pioneered map overlays for business decision making and public policy analysis at the FHA.

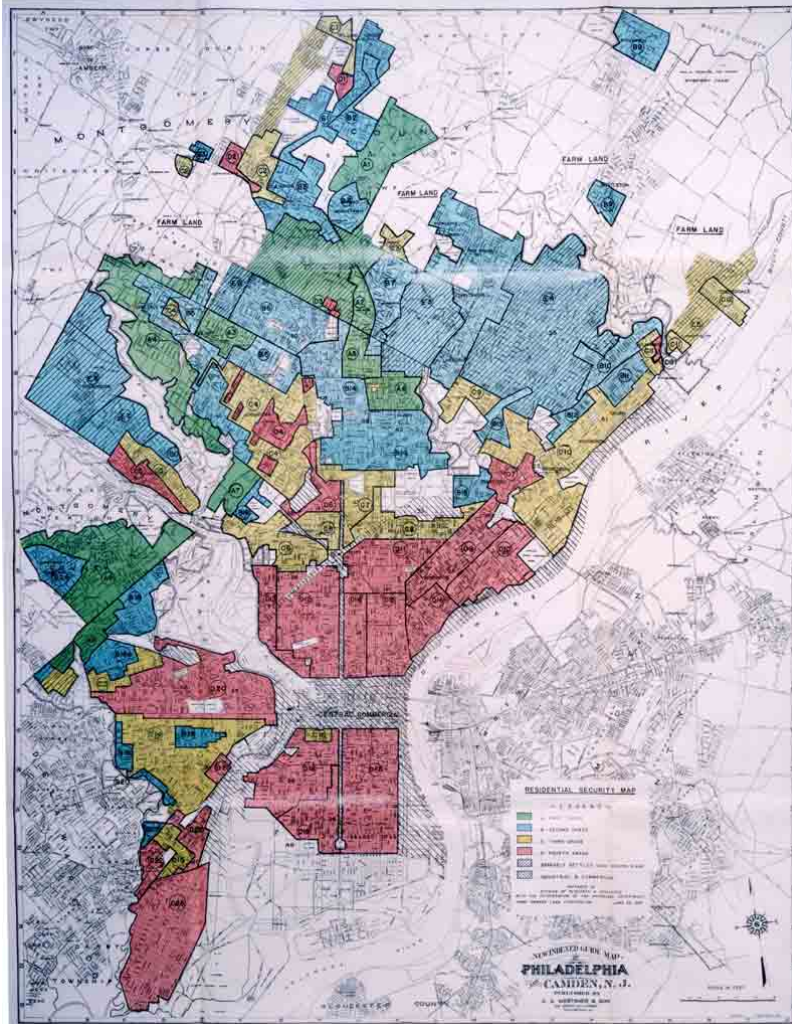


Exhibit 3

Hoyt's innovative use of maps predated both HOLC and FHA, but HOLC's maps came before FHA's.⁵ They were also the first of the two agencies to use racial characteristics explicitly in their risk analyses. Urban historian Kenneth Jackson (1980, 1985) referred to this approach as "redlining." Jackson notes that HOLC, while predating FHA in mapping neighborhoods by their economic and social characteristics, was using Hoyt's earlier work on Chicago and on

sector theory as a model.

Later research by Amy Hillier (2002, 2003) found that HOLC's actual lending patterns were not simplistically driven by the maps. Hillier and others have also documented patterns of consistent racial discrimination predating any of these maps.

⁵ Exhibit 3 presents one of the HOLC maps, sometimes mistakenly attributed to FHA and Homer Hoyt. The actual FHA maps are not readily available. See discussion of the connections between HOLC and FHA, and their mapping efforts, as well as Amy Hillier's recent research, within the next few paragraphs.

Hoyt's sector theory provided the foundation of socioeconomic models of neighborhood change. Hoyt documented that real estate values were a function of demographic indicators, particularly income and social standing. Race was – and still is – highly correlated to income and social standing (Mitchell 2012) and so in the view of Hoyt and others of his day could substitute for income and social standing in thematic map overlays.⁶ For some, this became the justification for “redlining” minority or racially mixed areas on maps.⁷

In econometrics the use of so-called “proxy variables” that are observable, and correlated with important unobservables, has a long history; see any econometric text (e.g. Maddala and Lahiri 1992, Chapter 11; and Wickens 1972). But the use of such a proxy variable can create ethical issues when they are human characteristics, such as race, ethnicity, or sex.

Mortgage lenders, and insurers, are encouraged – sometimes required – to “discriminate” against borrowers with lower or more volatile incomes, poor or insufficient credit histories; or education; but NOT race or religion or sex or (within bounds) age. First, while variables in the second group are often correlated with the more fundamental determinants of mortgage performance in the first group, these variables are at best proxies for the real determinants; and since proxies are imperfect, it is far more efficient, and fair, to use the fundamentals

⁶ Congress mandated that HOLC and FHA carefully assess the risks associated with the insured loans, and Hoyt and others developed detailed protocols for data collection and analysis; FHA's underwriting manual, for example, ran over 400 pages of detailed instructions. Neighborhood data used in FHA rankings included race but also a myriad of other elements including income, selling prices, foreclosures, zoning, physical geography, transport infrastructure, schools, shopping, and the characteristics of the housing stock. Of course, in addition to the use of race itself as one criterion, most of these other measures were themselves correlated with racial characteristics of neighborhoods, so it was no surprise that final neighborhood ratings would be correlated with race.

⁷ John Cloud, 2004 personal communication to Grant Thrall and in “The Case of the Missing Overlay: Pre-War German and American Cartographic Innovation and the Cold War Development of Geographical Information Systems,” notes that Hoyt's overlay mapping technique in his FHA work included using a red pencil to delineate neighborhoods according to socioeconomic status. See also Beauregard (2000).

directly. Second, traits like race, national origin and sex are immutable,⁸ while one has at least some control over one's income or education or credit score. Third, it turns out that empirical support for the usefulness of race as a proxy for market fundamentals is less robust than many formerly believed. Finally, and most importantly, marking large groups of individuals as effectively ineligible for basic market transactions for life, whatever their true risk profile, is immoral.

On reading the underwriting guidelines and other documents, one could argue that another shortcoming of FHA's early approach is the apparent fetish FHA attached to "stability." As the first FHA Underwriting Manual put it, "If a neighborhood is to retain stability it is necessary that properties shall continue to be occupied by the same social and racial classes. A change in social or racial occupancy generally leads to instability and a reduction in values." Notice a certain irony, in that statements about neighborhood *decline* are mirror images of the concern many evince, in the past as well as today, about neighborhood "*gentrification*." Neighborhoods constantly change their socio-economic makeup, and their housing rents and asset prices relative to other locations, over time, in both directions. See, for example, Grigsby (1986), Beauregard (1990), and Freeman (2005). The dynamics of housing markets are rarely if ever "Pareto optimal,"⁹ and never-ending.

⁸ Today, a series of legislative acts defines a number of legally "protected classes" including race, religion, national origin, sex, pregnancy, disability and veteran status. While these protections have their basis in the Thirteenth, Fourteenth and Fifteenth Amendments (1865, 1868 and 1870, respectively) and several 19th century Civil Rights Acts, effective definition of protected classes began with the Civil Rights Act of 1964 and a number of succeeding Acts. See <https://history.house.gov/Exhibitions-and-Publications/BAIC/Historical-Data/Constitutional-Amendments-and-Legislation/> and https://en.wikipedia.org/wiki/Protected_group.

⁹ Pareto optimal: benefiting some agents without harming others.

Successive FHA Underwriting Manuals softened the language a bit but did not fully eliminate racial requirements until the passage of the Fair Housing Act of 1968. Contemplation of a century of work on housing market volatility, in prices and in quantities, “land use succession,” a.k.a. filtering, of various kinds (in prices, in quantities, in incomes of residents), in different directions, suggests that whatever housing markets are, “stable” is not it; nor should it be. Housing market dynamics ensure that stability, and strict Pareto optimality will never be achieved. Yezer’s (2013) thought piece highlights how our refusal to *realistically* grapple with dynamics (in 1933, but also in 2005, and no doubt still today) hamstrings our ability to identify and manage mortgage risks.

Influential authors such as Jackson (1980, 1985) and Rothstein (2017) have emphasized the role played by HOLC and FHA policies in segregating U.S. housing markets; articles in the popular press like Nodjimbadem (2014) and Madrigal (2014) have given the impression that FHA was the primary driver of racial segregation. In fact, pre-1960 FHA Underwriting Guidelines were hardly the only, or even the strongest, drivers of racial segregation. Segregation and other forms of racial discrimination predated FHA (Massey and Denton 1993). Segregation is also found in rental markets, where household mortgages are not relevant. Schill and Wachter (1995) discuss the role of FHA and other policies but also provide a detailed discussion of many other drivers of segregation, including exclusionary zoning, tax policies, schools, labor policies, and so on.

In the end, the actual results of FHA and other policies is still hard to disentangle. Careful and credible econometric analyses of housing market discrimination, especially mortgage market

discrimination, are very difficult.¹⁰ Nevertheless, researchers continue to grapple with racial segregation and discrimination since, while on the wane by standard measures, it is still a fact of life. Representative studies such as Oh and Yinger 2015 and Wright, Ellis and Holloway 2014 can be consulted as well as anecdotal evidence. For example, 50 years after its racial covenants were outlawed,¹¹ the pioneering postwar suburb of Levittown is still less than 1 percent black.¹²

Hillier summarizes the state of play regarding the redlining controversy well:

The larger lesson, though, is that focusing on one agent of change, even if it is a large federal agency, is to assign relative passive roles to the thousands of appraisers, realtors and lenders who decided where to make loans. In assuming that they all adopted one set of maps to guide their decisions, researchers have underestimated the initiative and research skills of this large group. Alternatively, to view them as agents of change who shared some basic ideas about real estate valuation but did not necessarily implement them the same way is to invite the telling of a much richer and complicated redlining story than has been presented before.

¹⁰ For overviews, see Green and Malpezzi chapter 3 in general and Yezer on mortgage markets. Barth, Cordes and Yezer 1979, Benston 1979, Berkovec Canner Gabriel and Hannan (1994) and Ross and Tootell (2004) are representative scholarly articles.

¹¹ Lambert (1997), at <https://www.nytimes.com/1997/12/28/nyregion/at-50-levittown-contends-with-its-legacy-of-bias.html>.

¹² Census data at <http://levittownny.areaconnect.com/statistics.htm>.

Hoyt's Contributions to Economic Base Analysis and Regional Economics

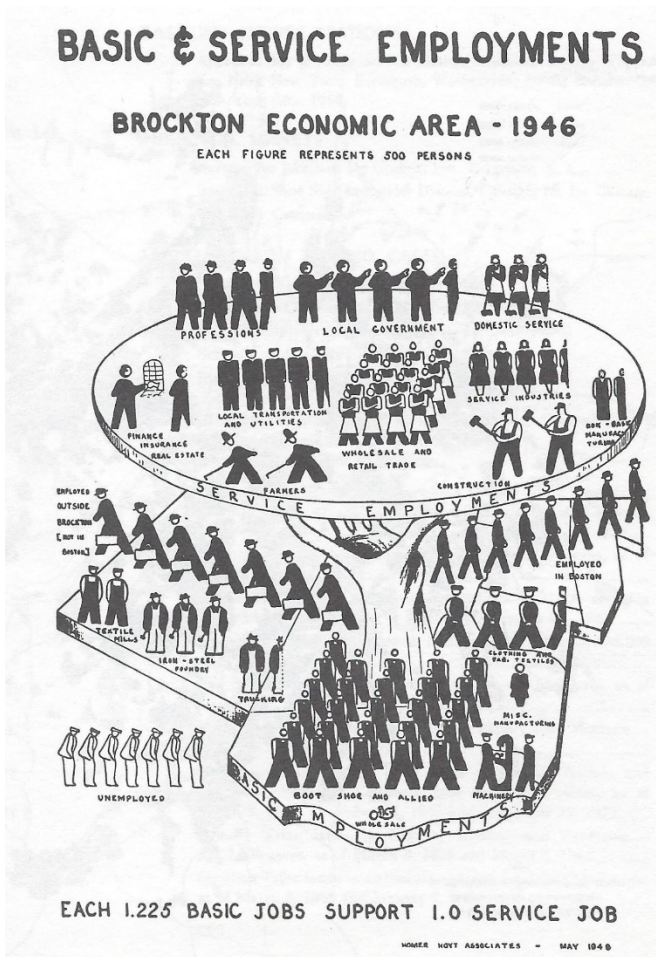


Exhibit 4

Hoyt was director of research for the Chicago Planning Commission from 1941 to 1943, during which time they published *Master Plan of Residential Land Use of Chicago* (1943). He then became director of economic studies for the Regional Plan Association in New York City (1943-1946) which produced *Economic Status of the New York Metropolitan Region in 1944* (1944). While executing his work for New York, Hoyt agreed to be a visiting professor of land economics at the Massachusetts Institute of Technology and at Columbia University.

Master plans typically have several major components, including basic data and (surprise!) plans for future transportation and other infrastructure. In the U.S. master plans often include zoning maps that segregate land uses, something that critics from Jacobs (1961) to Bertaud (2018) have found problematic. Alain Bertaud in particular argues that planners should focus instead on the city as a labor market, and make decisions about infrastructure and other public investments grounded in such analyses. Hoyt's focus on labor markets as a central organizing theme for planners is consistent with such a view.

This approach came naturally to Hoyt because he viewed the state of the local economy as the place to start any analysis of private real estate development as well as public planning.

Consequently, this is one of the first problems faced in the development of early real estate curricula as well. It's worth reminding ourselves that in the early working environment of Hoyt and his contemporaries there was no Bureau of Economic Analysis, or for that matter any such thing as GDP data. Simon Kuznets, James Meade, Richard Stone and others were only beginning the research that would yield the systems of national accounts that we take for granted today.¹³

Prior to the development of economic base analysis, real estate analysts and other students of local economies had little to rely on besides simple trend forecasts of population, and a few anecdotes. This was a toolkit of limited usefulness, as Hoyt (1951) demonstrated.

Analyzing cities by studying their "economic base," or export markets, is usually first attributed to Haig's contributions to the (1928) *Regional Plan for New York*. But for real estate practitioners the real start was Hoyt's analysis of a real estate market's economic base in the first edition of his *Principles of Urban Real Estate* with Arthur Weimer, appearing in 1939. Exhibit 4, from a 1948 study of Brockton in According to Hoyt (p. 713), illustrates the principle graphically, but in a number of papers and publications including various editions of the Weimer and Hoyt textbook, Hoyt provided estimates of basic employment for a range of metropolitan areas.

¹³ See Coyle (2014) for an entertaining discussion of GDP, including its history, and Malpezzi (2011) for a broad discussion of GDP and other macroeconomic indicators.

The idea that some economic base – exports – drives the economy was argued at least as far back as Smith (1776). But Hoyt, Weimer and those who followed – notably Andrews in a series of 1953 papers appearing in *Land Economics* – showed how to operationalize the insight, and how to collect the data. Hoyt and colleagues always highlighted the remaining shortcomings of then-current methods, for example using fixed ratios between base/export industries and local services (a mistake still made today with distressing frequency). While economic base analysis based on simple ratios has been supplanted by careful analysts, most of the field of regional economics, i.e. today's input-output models and econometric modeling of cities, stems from this path-breaking work. Introductions to these extensions can be found in Hewings and Jensen (1987) and Bolton (1985).

Homer Hoyt and Retail Real Estate

Later in his career Homer Hoyt began to focus on the emerging concept of suburban shopping centers beginning about 1948 through his applied research with the Urban Land Institute.

As Hoyt (1940, 1941) and numerous later studies such as Mills (1972), Jackson (1987) and Baum-Snow (2007) demonstrate, suburbanization of households, and economic activity, including retail, had many causes. These included income growth and demographic shifts; certainly the postwar revolution in transportation played its part. The number of automobiles grew from a negligible number before WWI, approaching one per household by 1930; after stagnating during the Depression and WWII, auto ownership per household doubled over a

mere 3 decades after the War. Growth in road mileage and improvement in their quality complemented the increase in available vehicles.

Homer Hoyt's first study of a North Carolina site (pre-Google Earth!) involved repeated flyovers over the site and nearby regions in a small plane, as well as collecting whatever collateral data were available at the time. Over time, Hoyt developed data and analytic protocols used by himself and others; these included analyses of clustering, what we now call agglomeration economies, foreshadowing later research such as Benjamin Boyle and Sirmans (1990). Broad reviews of the history of shopping centers can be found in Gillette (1985); see Eppli and Benjamin (1984) for a complementary review of the economics.

Hoyt developed early shopping center classifications. His 1958 scheme defined regional centers as those comprising one or more major department store anchors, of 100,000 sq. ft. or more; with a total center store area 250,000 to 1,000,000 sq.ft.; on a 35 to 100 acre site. A community center was typically anchored by a "junior" department store of 25-90,000 sq.ft., with a total store area of 100-400,000 sq.ft., on a site of 15 to 40 acres. A large neighborhood center would typically be anchored by a variety store or clothing store of 10-20,000 sq.ft., with a total store area 50-100,000 sq.ft., on a site of 10-20 acres. Hoyt's small neighborhood center would be anchored by a supermarket of 10-20,000 sq.ft., with a total store area (including drug store, hardware, other convenience retail) under 50,000 sq.ft., on a site of 5-10 acres.

Of course, categories have evolved, as have stores, notably increasing in size as well as changing location. “Big box,” “strip centers” and the like have entered the lexicon. Hoyt carefully

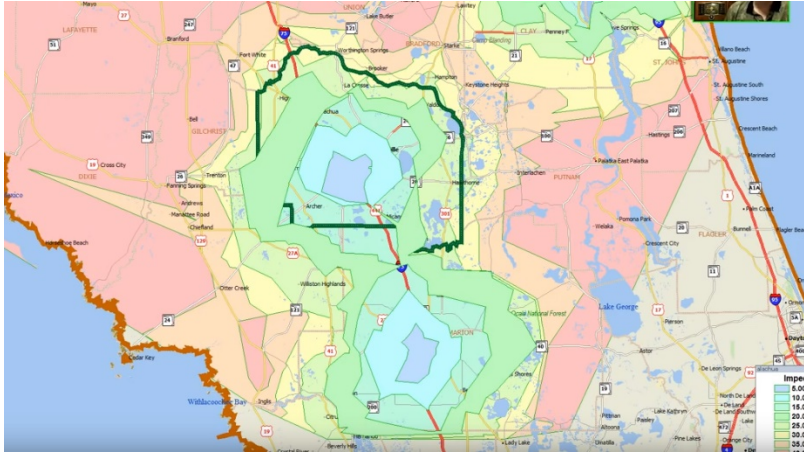


Exhibit 5

collected data on the financials of shopping centers; his analyses presaged later publications like “Dollars & Cents of Shopping Centers” by the Urban Land Institute and the International Council of

Shopping Centers. Hoyt was also one of the pioneers in developing trade areas for retail centers; a modern example taken from a presentation by Grant Thrall is presented here as Exhibit 5.¹⁴

¹⁴ See Thrall’s YouTube lecture on “Distance Band Trade Areas” at <https://www.youtube.com/watch?v=ZfkeOYNYTYE>.

Homer Hoyt's International Work

METROPOLITAN AREAS IN SELECTED NATIONS RANKED IN ACCORDANCE TO SIZE, 1953-1960

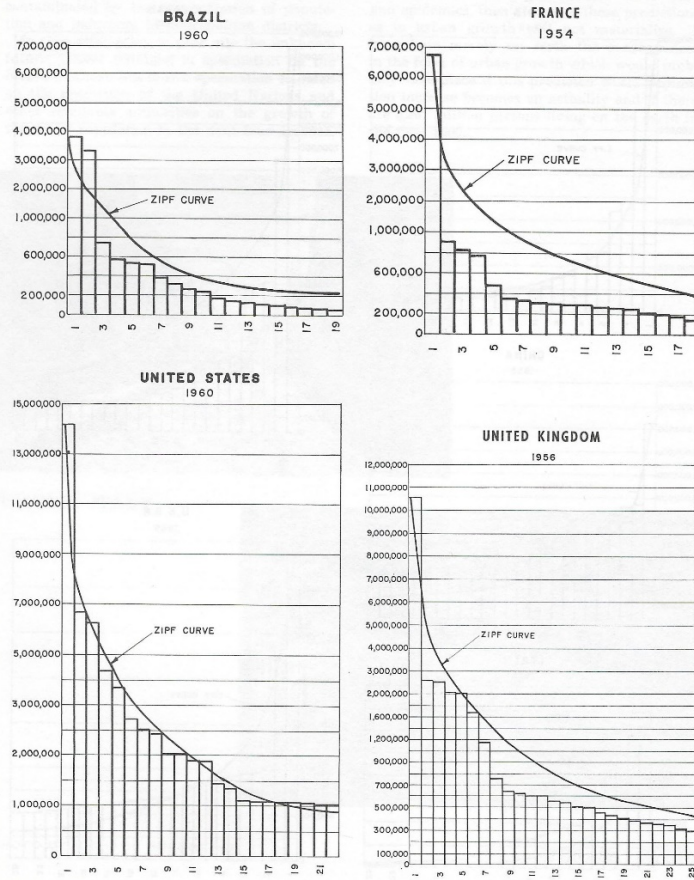


Exhibit 6

Hoyt was also ahead of his time in concerning himself with the problems of urbanization and housing globally, with special attention to “developing countries.” His work for the United Nations provided early urban population forecasts to the 2000s which turned out to be reasonably accurate. This work was later codified in regular U.N. publications and databases on the web, now mainly online. See United Nations (2018) and other material at

<https://population.un.org/wup/>.

Hoyt also analyzed the distribution of city populations within countries, providing some of the early applications of testing “Zipf’s law” against such distributions. Exhibit 6 reproduces selected figures from this research.

Zipf’s Law is actually not a law but a hypothesis, that the size distribution of cities follows a particular power law, such that the frequency of cities of a given size is inversely proportional to

its size rank. Suppose the largest city in a country or region is 10 million. Then if the region's cities follow the simple version of Zipf's distribution (also known as a discrete Pareto distribution), then the population of the second largest city would be expected to be 5 million; the third largest would be about 3.3 million, the fourth largest 2.5 million, ... the tenth largest 1 million, the eleventh largest 0.9 million, ... and so on. In Exhibit 6, the size distribution of U.S. cities happens to closely follow Zipf's distribution (confirmed for other years by Rosen and Resnick 1980). But the distribution does not work so well for other countries, especially France. While debates about the fit and various ways to fit generalizations of Zipf's distribution have interested some scholars (e.g. Gabaix 1999), the real contribution of these initial forays into the study of the size distribution of cities is in motivating models of systems of cities, e.g. the central place theories used by geographers (Berry 1964) and economic models pioneered by Vern Henderson (1974).

Hoyt's observations on housing conditions, for example in his 1963 "Study of International Housing," can be profitably read alongside some other early analysts of these issues like Abrams (1964) and Turner (1963). Among other recommendations, Hoyt noted infrastructure's key role as a precondition for improvement in developing country housing conditions, especially water supply and sanitation (WHO/UNICEF 2014). Cost recovery was another prescient theme of Hoyt's recommendations – external aid could perhaps play a catalytic role in addressing global housing problems, but given the scale required, in the end resources would need to be mobilized from the residents themselves (Buckley and Kalarickal 2010; Renaud 2010). Hoyt pointed out the folly in locating public housing developments far from jobs and required services, an issue still with us today (Lall et al. 2007). Hoyt perhaps underestimated

the hidden dynamism of informal labor markets in cities like Karachi.¹⁵ But he was spot-on when he flagged the problems of creating large refugee camps far from employment and urban services; see Betts and Collier (2017) for a recent introduction.

Taken as a whole, Hoyt's observations on urbanization and housing policies foreshadowed later more detailed assessments that had the advantage of decades of additional research and experience, such as Malpezzi (1990), World Bank (1991, 1993) and Glaeser (2011).

¹⁵ The idea that labor markets in many developing country cities were woefully undeveloped was widely shared in the 1960s and 70s, giving rise to the (in)famous Harris-Todaro model that posited widespread un- and under-employment in developing country cities. Harris-Todaro and the idea of widespread urban underemployment has been discredited both empirically (Pratap and Quintin 2006) and theoretically (Brueckner and Kim 2001) but is still widely referenced. Kahnert (1987) and Berry and Sabot (1987) represent many papers that later clarified labor markets *per se* are not usually the primary causes of urban poverty; low levels of human capital, poor governance and institutions, perverse economic policies, and other problems are more often the proximate causes.

Later Career, and Life

Hoyt Associates was founded in Larchmont, New York, at the end of the 2nd World War, and shortly thereafter relocated to Washington D.C. in 1953. The consulting firm of Hoyt Associates specialized in land economics, the provision of demographic studies and real estate appraisals, highest and best use for a site, and location advisory services for a use such as a regional mall. His clients included country and city governments, and private investors. He forecasted the rapid post-war population, suburbanization, and advised local governments to put planning regulations in place ahead of rapid development. Hoyt's consulting firm by the early 1970's, had performed market analysis for over 200 shopping centers throughout the U.S.

In 1974, Hoyt shifted his entrepreneurial interests, and applied his scholastic models, to guide his own real estate investments. Homer Hoyt was successful as real estate investor. His endowment to HHI was the acquisition of a barrier island off the coast of St. Lucie County, FL. This island was later sold to the State of Florida to be a turtle sanctuary, and the proceeds used to sustain HHI (www.hoyt.org). Hoyt Associates continues as Hoyt Advisory Services, a wholly owned subsidiary of the non-profit HHI.

Throughout his adult life, Homer Hoyt maintained a pace of scholarly research and writing that put him at the forefront of land economics, real estate and geography. Yet, throughout his adult life his primary income came not from professorial wages, but instead from consulting and investment.

Homer Hoyt is survived by one son, Michael, a step-son Eugene and a step-daughter Alice. Gertrude Hoyt died in 1975. After nine years as a widower, Homer Hoyt died of pneumonia at

Holy Cross Hospital in Silver Springs, Maryland in November 1984. He is buried in Chicago, Illinois.

The Homer Hoyt Institute and the Weimer School

Hoyt made good use of his analytics in his own investment decisions, although his best investments took some time to mature. As a consequence, it was later in life that he was able to donate a significant parcel of undeveloped Florida land to provide the initial financial underpinnings of the Institute that bears his name. All real estate professionals know that undeveloped unpermitted land can provide excellent returns when things go well, but they also know that bringing such investment to fruition takes time and carries considerable risk. Thus some years elapsed between the original 1979 founding of the Institute, and the 1984 sale of the land, spearheaded by American University real estate Professor Maury Seldin. With the realization of the endowment, the Institute was able to move from American University, where it was originally housed, to become a freestanding educational institution, headquartered in Singer Island near West Palm Beach, under the direction of then-Homer Hoyt Institute Chairman Seldin, then-Weimer School Dean Ron Racster (real estate professor at The Ohio State University) and then-Director of the Hoyt Fellows Hal Smith (real estate professor at the University of Florida).

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This paper is a “first edition.” Comments, extensions, and corrections are cordially invited.

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Many of Homer Hoyt’s papers including his shopping center maps and reports are at Florida State University in Tallahassee; Marymount University in Arlington, Virginia; the library of University of Florida in Gainesville. Grant Thrall (www.businessgeography.com) has copies of many of these documents, as does the Homer Hoyt Institute (www.hoyt.org).

Hoyt’s obituary was published in *The Washington Post*, 30 November 1984, p. B16, and *The New York Times*, 1 December 1984.

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