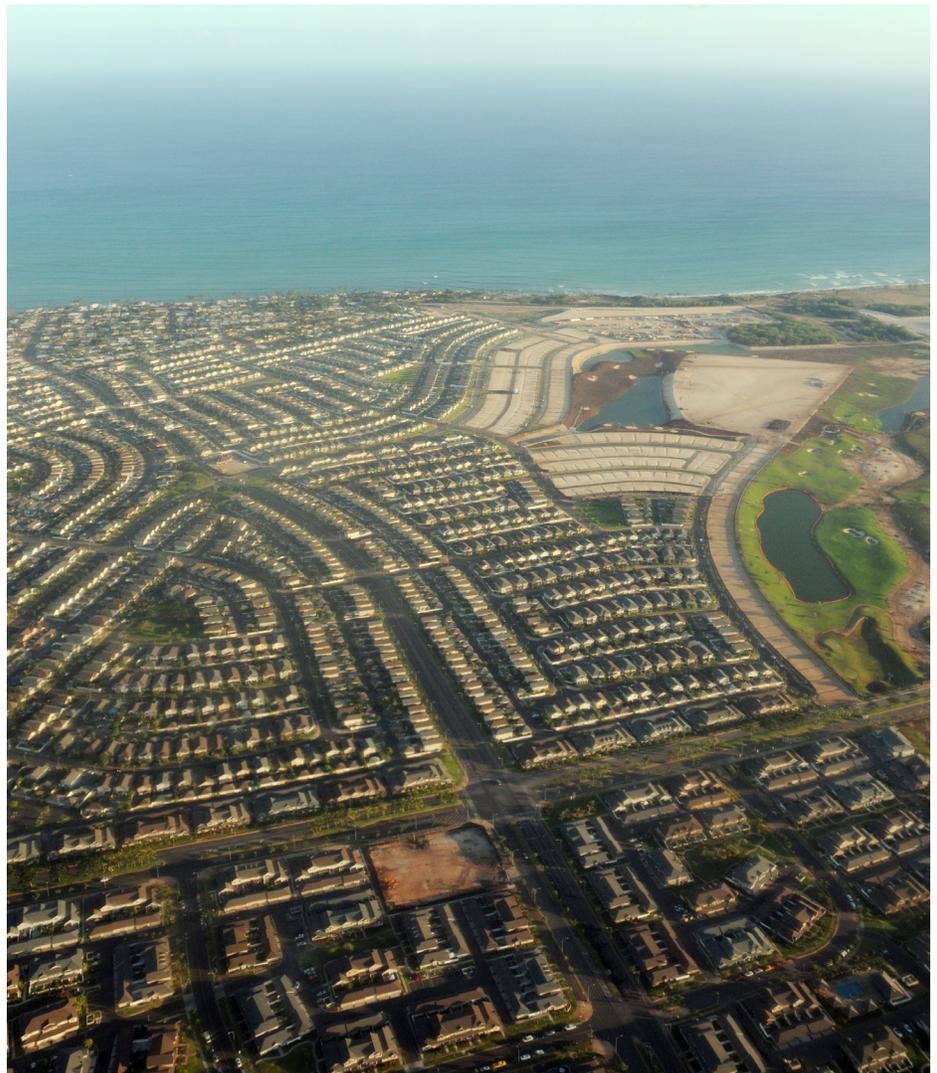
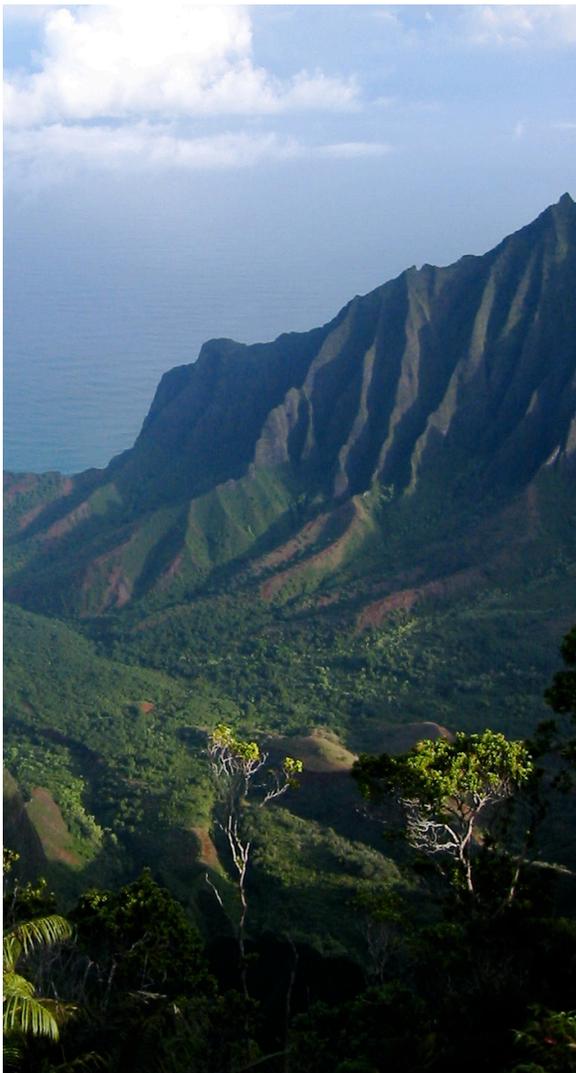


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THE ECONOMIC RESEARCH ORGANIZATION
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NEW PERSPECTIVES ON LAND AND HOUSING MARKETS IN HAWAII: IMPLICATIONS FOR INDUSTRIAL AND COMMERCIAL LAND LEASING

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Executive Summary

Land leasing is common in Honolulu, with many owners of residential, industrial, and commercial buildings leasing land. This report examines land and housing markets in Honolulu and the mainland United States to understand better why prices and lease rents are so much higher in Honolulu than most other US cities. Three stylized facts stand out:

- Census data show that Hawaii home prices were already exceptionally high in 1950.
- Over the last six decades, inflation-adjusted land and housing prices in Honolulu register small annual real increases.
- Honolulu's inflation-adjusted land and housing prices have been highly volatile in the medium term since the 1960s, forcing market participants to bear high levels of risk.

This report surveys and extends a new economics literature that examines the value of land in U.S. residential, industrial, and commercial markets. Three central findings are:

- Increases in U.S. housing prices between 1980 and 2004 were largest in those markets where the share of land in housing prices was already relatively high in 1980.
- U.S. housing prices tended to be more volatile in markets where the share of land in housing prices was high.
- Prices in U.S. residential, commercial, and industrial land markets tended to move together over the 1990-2009 period and all were volatile.

Have residential, commercial and industrial prices in Honolulu followed national patterns? It's not an easy comparison to make as we do not have carefully constructed indexes of commercial and industrial land prices for Honolulu. We know that Honolulu single family home prices are higher than in all but four mainland markets and have been quite volatile over the medium-term for the last thirty-five years. The volatile market has consequences for those purchasing a home (and the land) for the medium term and for those purchasing a leasehold property subject to renegotiation. The volatility in the market means that your inflation-adjusted return on housing is highly dependent on when you invested in the housing. The same difficulties apply to those who lease commercial, residential, and industrial land and have renegotiation clauses in their leases.

Why are land and housing prices so high in Honolulu? Three supply-oriented reasons stand out:

- Honolulu has far more regulation of residential development than any other US metropolitan area. An index measuring land use regulation in U.S. cities—the Wharton Residential Land Use Regulatory Index—ranks Honolulu as the most regulated U.S. city. Its high score stems from multiple layers of rigorous, lengthy review by both state and county governments for all new development projects.
- Honolulu has a very small natural supply of developable land, with roughly 92 percent of the 50-kilometre radius circle centered on the Honolulu downtown not developable.
- Homeowners regularly lobby for more government restrictions to preserve the already high value of their properties (“the home voter effect”).

The remainder of Honolulu’s price premium has roots in the many positive attributes associated with living in Honolulu. Media and consulting firm surveys regularly place Honolulu among the top cities for quality of life. Consider the following attributes which are likely to positively affect the Honolulu price: Warm ocean waters; high number of sun days, moderate temperatures, trades winds; a multi-cultural and multi-ethnic social environment, highlighted by the host Native Hawaiian culture; relatively low racial and ethnic tensions; and a low crime rate. To gain access to these positive environmental attributes, Honolulu residents compete with each other and with people living outside Hawaii to pay higher housing prices and to accept lower wages.

The amenity-driven consumer demand for Honolulu homes, condos, and residential land stock does not just affect the price of residential land. Recent studies of mainland US markets show that all three land markets are closely linked. As Honolulu residents and globally mobile buyers compete for a limited stock of residential land and housing, these effects spill over into commercial and industrial land markets, driving up prices and rents.

Potential Policy Implications

Would land reform measures allowing lessees to purchase leased lands resolve Hawaii’s market prices for industrial and commercial lands? Underlying these proposals is the idea that large land owners with market power would gain new incentives to develop additional lands after divestment. However, in central areas, such as Mapunapuna, there is little unused land to be released to the market for development. And without an increase in the supply of land to the industrial market, there is no reason to believe that lease rents on industrial and commercial land would fall if large landowners were forced to sell their holdings.

Three plausible but not necessarily politically feasible policy options remain:

- The State of Hawaii could examine its landholdings near industrial areas and to determine whether additional state lands could be dedicated to industrial use.

- The City and County of Honolulu could zone more land for industrial use in or very near the central business district-Waikiki-Aiea areas.
- The City and County of Honolulu could allow denser development on industrially zoned land. One way to accommodate this would be for the City to review its rules on development of industrial-zoned lands and to revise them to lower the regulatory burden of development.

Introduction

In Honolulu, land owners have often decided to lease rather than sell their lands for development projects. Many owners of homes, condominiums, and commercial buildings lease the land upon which they build their structures. Industrial firms are no exception, typically leasing the land upon which their buildings specialized in wholesale operations, storage, or manufacturing activities sit. Lessees have frequently complained that they have paid excessively high land rents due to the market power of land owners and to waves of foreign and mainland investment in all of Honolulu's land markets. It has regularly been argued that high land prices are primarily due to a lack of competition in the Honolulu land market, with a few large estates, firms, and individuals owning a large percentage of Oahu's land. Backing up this argument is the increase in land concentration from the late nineteenth century to the mid-twentieth century among land owners who were part of Hawaii's colonial, missionary, and native Hawaiian elites.

To understand lessee complaints about high lease rents, one needs to step back and reflect on three central features of Honolulu's land and housing markets. First, high land and housing prices relative to the rest of the United States are nothing new for Honolulu or the State of Hawaii. Census data show that home prices were already exceptionally high in 1950. Second, after adjusting for big increases in the overall level of prices in Honolulu over the last six decades, Honolulu land and housing prices have registered only very modest annual increases. Third, Honolulu's inflation-adjusted land and housing prices have been highly volatile since the 1960s, registering large increases and decreases that have forced market participants to bear high levels of risk.

Honolulu's long history of high land prices relative to the U.S. mainland tells us that any explanations of high land and housing prices must be rooted in history to be valid. Three factors besides concentrated land ownership stand out as candidates. First, Hawaii's world-class amenities—the best weather in the world, warm ocean waters suitable for recreation activities, beautiful views and landscapes, an array of valuable natural resources, thriving European, Asian, and Pacific cultures, and the aloha spirit—have led Hawaii's residents to compete with each other to pay higher land and housing rents and to be paid lower wages for the privilege of living in Hawaii. Second, this competition to live in paradise is exacerbated by the population being concentrated in the smallest natural supply of land available in any U.S. metropolitan area. Higher rents in the central city that middle-income residents could normally escape by moving to a distant suburb would leave a Honolulu family paddling a canoe in the middle of the Moloka'i Channel. And third, the process of competition in Honolulu land and housing markets takes place under the watchful eyes of state and county governments that together impose the most severe regulation on land development to be found in any large U.S. metropolitan area.¹

It is, however, not just high prices that have been inflicting pain on lessees of land in Honolulu. Since the 1960s, land prices have been highly volatile, with large swings in inflation-adjusted prices leaving lessees vulnerable to big changes in their fixed lease rents when the time comes for renegotiation, i.e., for the contract rent to be reset to

¹ Hawaii's valuable ports and its strategic location in the Pacific Ocean also raise the value of Hawaii lands to the U.S. air force, army, navy, and marines, which together use a significant proportion of Oahu's land.

the market rate. Volatility is particularly important for participants in Honolulu land markets, because unexpected changes in lease rents can impose significant risks on home and business owners at renegotiation that are difficult to hedge appropriately and can impair their ability to operate a business or own a home.

If renegotiation mid-term through the lease often imposes high burdens on lessees, why are leases not structured differently to minimize these burdens? Would lessees be better off if they owned the property under their structures? Are there economic reasons for the structure of industrial and commercial leases or are they mere artifacts of the way that land markets have historically developed in Hawaii? In the next section, we review the structure and logic of land leases to provide the reader with the necessary context to consider various answers to these questions.

Industrial and Commercial Land Leases: Understanding their Structure

Throughout the United States, it is common for firms to own the land on which their retail stores, factories, warehouses, or law offices sit. Site ownership is particularly appealing when a firm's investments are highly site-specific, as this reduces opportunities for the landlord to take actions to appropriate rents from lessee assets that have little or no value outside of the site. Site ownership also has its costs, as it increases the size and complexity of the business. Land ownership increases a firm's capital requirements, a factor that can lead to higher costs of capital or reduced access to loans, and may require additional managerial competencies that many small and medium-sized firms cannot afford. Leasing of land allows for these constraints to be relaxed in some instances, allowing both lessors and lessees to anticipate gains. Given the broad circumstances under which land leasing can be efficient, it is unsurprising to find that it is widely used in industrial and commercial land markets in all 50 U.S. states. Commercial and industrial leasehold are far from uniquely Hawaiian contracts but rather are ubiquitous.

What factors determine the structure of a land lease contract? Some factors that are important in the context of labor and insurance contracts – adverse selection and moral hazard – are much less important in structuring land leases. “Moral hazard” occurs when one party to a contract is able to vary the services provided without the other party being able to adequately monitor their actions. Moral hazard is less important in land contracting because the owner of the land has very little room to vary the supply of land services provided to the lessee. “Adverse selection” occurs when parties hide information about themselves when they enter into contracts. Adverse selection is less important in land contracting because the lessee has little incentive to build (or purchase) site-specific assets on land unless it expects to be able to generate sufficient streams of revenue to pay the specified lease rents. More important to the structuring of land leasing contracts are such factors as uncertainty of lessee income streams over extended time periods and the site-specific nature of the structure owned by the lessee. Both contracting parties have incentives to account for these factors by adjusting central contractual terms, in particular the duration of the lease, the mechanism for determining annual rental payments during each year of the contract, and the parties' rights to terminate the contract.

Consider first the duration of the contract. An important determinant of contract duration is whether the lessee plans to invest in (or has purchased) physical capital that is “specific” to the particular site, i.e., would have

a much lower value if salvaged or moved to another land parcel. If a building structure is specific to a land parcel and has an economic life of, say, 20 years, it would be in both parties' interest to set the duration of the contract at 20 years. If the duration of the contract were to be set at less than 20 years, then the land owner would be able to appropriate part or all of the remaining value (quasi-rents) of the site-specific building. If the contract were to be set for more than 20 years, then the building owner would pay land rent even after the useful economic life of the building had ended, a contractual feature that would usually not be chosen by the lessee.² To sum up, setting the contract at a length sufficient to cover the economic life of the building is a necessary condition for the lessee to agree to participate in the contract.

Now consider how a 20-year land lease would specify rental payments in the presence of uncertainty regarding the path of land rents in the Honolulu land market over the next 20 years. There are four basic types of pricing mechanisms that contracting parties can use to set and adjust annual rents: (1) a spot market rent that resets every year; (2) a fixed rent set explicitly for each year of the contract; (3) an initial fixed rent that is adjusted periodically by a publicly-available price index; and (4) an initial fixed rent that is reset at specified intervals according to a contractually determined formula. The choice of pricing mechanism is important for both parties, because it determines how they will share risks stemming from unexpected shocks to the land market.

Contracting parties in the land market rarely choose the spot market option as spot market land rents are infrequently observed in commercial and industrial land markets in which there is a prevalence of long-term leases. Prices of land on comparable properties might be used to infer spot market rents, but sales of comparable parcels in a particular area may be infrequent, and it can be difficult to account for different characteristics of each property. While this type of contract has the advantage of frequently adjusting contract prices to reflect market prices, the costs of discovering these prices are usually too high for the two parties to bear. A second option for a long-term lease, specifying a stream of fixed rents, is also rarely observed, as the likelihood that a fixed contract price differs substantially from the actual spot market price increases as the contract plays out over time.³ A fixed rent with an annual index adjustment has more appeal to the economist but is also rarely observed in practice. Such a contract is clearly feasible in the Honolulu land market, as the Honolulu Consumer Price Index is available from U.S. Bureau of Labor Statistics every six months. Using it to adjust rents would help to insulate the two parties from risks arising from unexpected changes in the overall price level. Examples of indexed lease rent contracts are the residential land leases made by the Irvine Company in Irvine and Newport Beach, California. Since the early 1980s, lease rents on

2 For classic discussions of the role of relationship-specific capital, uncertainty, complexity of transaction, and transaction frequency in determining contract duration and contract terms, see Benjamin Klein, Robert G. Crawford, and Armen A. Alchian (1978), "Vertical Integration, Appropriable Rents, and the Competitive Contracting Process," *Journal of Law & Economics* 21(2): 297-326; Paul L. Joskow (1987), "Contract Duration and Relationship-Specific Investments: Empirical Evidence from Coal Markets," *American Economic Review* 77(1) March: 168-185; and Howard A. Shelanski and Peter G. Klein (1995), "Empirical Research in Transaction Cost Economics: A Review and Assessment," *Journal of Law, Economics, & Organization* 11(2) October: 335-361. Standardization of contracts offered by a lessor or lessors operating within a particular market can loosen the tight relationship described in the text between the economic life of a structure and the duration of the lease.

3 From a more technical viewpoint: If land prices evolve as a random walk, the expectation of the future spot price will be today's price, with the variance of the price increasing as the contract plays out.

the Irvine Company's residential parcels have been adjusted by the change in the Los Angeles metropolitan area consumer price (CPI) index. While such indexing adjusts for risks associated with unexpected inflation shocks, it still leaves both parties unprotected against future price shocks that are specific to the city's land market. In their 2013 study of land markets in 20 major U.S. cities, economists Joseph Nichols, Stephen Oliner, and Michael Mulhall show that such city-specific risks are important factors in generating price fluctuations in metropolitan area land markets.⁴

Most commercial/industrial land leases in Hawaii are hybrid contracts, combining elements of a fixed rent contract and a spot market contract. The contract essentially consists of two or more, sequential, medium-to-long term, fixed-rent contracts. The rent—or sequence of rental payments—for the first contract is specified in the initial lease between lessor and lessee and should equal the average expected spot rent over the initial fixed term of the contract.⁵ Since the lease rents are fixed for an initial term (5-20 years), this contract design assigns residual income accruing from positive shocks to the land market to the lessee (who pays pre-specified rents that turn out to be below actual average spot market rents) and negative shocks to the land market benefit the lessor (who receives pre-specified rents that are above the average spot market rents). At the renegotiation date—the start of the second contract, the new fixed lease rent is determined by a formula that, if correctly applied, yields a lease rent roughly equal to the average expected spot rent over the remaining term of the contract. The basic idea is that both the lessor and the lessee want to have a fixed rent over the duration of the contract, but that the contract term is too long (due to the site-specific nature of the structure) for either party to bear the risk that could accrue if a series of unexpected shocks to the Honolulu land market results in a market rent that is substantially different from the contract rent. Thus, a leasehold contract design emerges in which the owner of the land and the owner of the structure agree to two consecutive medium-term contracts, with the lease rent set to the average of the expected spots rents at the beginning of each of the two contracts.

Setting the lease rent for the second medium-term contract is done by a formula specified in the contract. The new lease rent equals the long-term rate of return on land in Hawaii multiplied by an estimate of the market value of the leased land. Since the vast majority of appraisers in Hawaii use the same fixed rate of return on land (8 percent) in calculating lease rents, the adjustment in the lease rent is fully determined by the change in the market value of land since the start of the lease. If the estimate of land value used to determine the new rent is accurate, then the new lease rent will be roughly equal to the average value of expected spot lease rents for the indefinite future.⁶

Since the leased land is rarely exchanged in the market during the lease's initial term of fixed rents, how is the market value of the land determined for purposes of determining the new lease rent? The contracts typically specify a panel of three appraisers: one appointed by the lessor, one by the lessee, and one by the two appointees. The use

4 See Joseph B. Nichols, Joseph B., Stephen D. Oliner, and Michael R. Mulhall (2013). "Swings in commercial and residential land prices in the United States." *Journal of Urban Economics* 73(1): 57-76.

5 This obviously could vary if expected spots rents are trending or the rate at which rents are discounted varies over time.

6 If average expected spots rents after the end of the leasehold contract differ substantially from average expected spot rents during the second term of the contract, then the new lease rent could be substantially higher or lower than the average of the expected spot rents over the contract's second period.

of a three-person panel makes it more likely that the value of the land will be correctly estimated, as each party has incentives to block the appointment of a third arbitrator who is biased towards one of the parties. This type of arbitration is an expensive procedure, and this expense likely accounts for the small number of rent renegotiations over the duration of the contract. Small- and medium-size firms leasing land have regularly complained about the arbitration procedure, and the roots of these complaints may well lie in the inherently high transaction costs associated with this type of contract. In some cases, firms leasing land are likely to conclude that the transaction costs associated with leasing are sufficiently high to justify purchasing the land and will do so. In Honolulu's market, land zoned for commercial and industrial use in the main urban corridor is rarely available for sale.⁷ And this means that some commercial and industrial firms that would gain from owning the land beneath their structures cannot do so.

Finally, leasehold contracts generally do not allow either party to cancel the lease, i.e., to walk away from it, mid-way through its term. When the lease is initially negotiated, this feature is desirable to a lessee who invests (or purchases) a site-specific structure. If the lessor could cancel the lease at the end of the first period, the lessee would lose site-specific rents from the investment and would be unwilling to initially make such a long-lived investment. When the lease is initially negotiated, this feature is also desired by the lessor. If the lessee could cancel the lease at renegotiation, then the two-period lease would be transformed into a one-period lease with an option to renew for a second period at a market rent. To compensate the lessor for risk of cancellation, the first period rent would have to be raised even higher, an adjustment that would chill demand in the already high-priced Honolulu market. Without a no-termination clause, the hybrid lease contract would be incapable of protecting the site-specific capital of the lessee or providing a market-based return to the land owner.

In sum, preferences on the part of both parties to align contract and market prices can be accommodated by specifying periodic resetting of the fixed contract price at fixed intervals. Such renegotiation is, however, particularly costly, and some lessees would rather own than rent the land. In the context of Honolulu's land markets, this has not been possible and these parties correctly perceive that they operate in a higher cost environment than they would if they owned the land they lease. Two earlier reports on commercial and industrial leasehold rents discussed problems that arise during contract renegotiation and have emphasized problems with ensuring a fair renegotiation process. I provide brief summaries of their results in the next section to place this report in context.

7 It has been regularly argued that Hawaii's concentrated land ownership is likely to be responsible for the phenomenon of land leasing, as a monopoly landowner may, under certain conditions, gain more from leasing than selling its lands. For the classic article in this context, see Ronald Coase (1972), "Durability and Monopoly", *Journal of Law and Economics* 15(1): 143–149. For a review and update of this literature, see R. Preston McAfee and Thomas Wiseman (2008), "Capacity Choice Counters the Coase Conjecture," *Review of Economic Studies* 75(1): 317–332. The argument that a durable goods monopolist has more incentive to lease rather than sell its product does not apply well to commercial and industrial land in Honolulu for a number of reasons. First, land ownership in Honolulu is concentrated but far from monopolized by a single owner. The Honolulu land market is best characterized as an oligopoly in which a small number of owners own a large proportion of the usable land. This is important, as the premium over the competitive price that an oligopolistic land owner can charge is much less than the premium that a monopolistic land owner can charge. See McAfee and Wiseman (2008) for a discussion of the differences between monopoly and oligopoly markets and durable good leasing. Second, a price premium can only be effective if some land owners voluntarily remove some of their land from the market. In Honolulu, there is no evidence that land owners set aside valuable industrial and commercial lands to stand empty or underused in the city's densely developed urban corridors. Finally, even if a group of oligopolistic land owners initially withdraw lands from the market, individual land owners have incentives to put them back on the market, particularly in an environment of rising prices.

Previous Reports on Commercial With Industrial Leasehold Rents

Several earlier reports on commercial and industrial leasehold have discussed the structure of commercial and industrial leasehold land markets and have addressed lessee complaints with how they work. The two most recent reports were published in 1993 and 2003.

In 1993, the Hawaii State Legislature had received complaints from lessees regarding how the high price of land in Honolulu had raised lease rents when their lease was renegotiated. The complaints were motivated by the huge run-up in land and housing prices that occurred in Honolulu over the 1984-1991 period. The Legislature passed a resolution calling for “Convening a Task Force to Study the Major Problems Facing Commercial Land Lessees.” In 1993, a Task Force was convened and it issued a report with five major policy recommendations.

Three of the Task Force’s recommendations focused on the selection of arbitrators and standards of arbitration at mid-stream leasehold rent renegotiation. They were directed towards ensuring that unbiased arbitrators were selected and that arbitrators followed a specified set of professional standards to determine the property’s value. The first recommendation was to change state law “to ensure that arbitrators for lease rent renegotiations are selected through a double blind process”; the second recommendation was for the state to require counties to “review assessment procedures for conformity with the Uniform Standards of Professional Appraisal Practices”; and the third recommendation was that “[t]he Legislature should enact legislation to designate the American Arbitration Association to administer arbitration panel to determine the fair market rents at the time of commercial and industrial leasehold rent renegotiation.” None of the recommendations was seriously addressed by the Legislature in the decade following the Task Force report.

The Task Force’s fourth recommendation was to “explore methods to establish longer periods of known rents”. The Task Force met in the aftermath of the huge 1984-1991 run-up in Honolulu land and housing prices when the median market price of a single-family home had soared by 150 percent and land prices had risen even faster.⁸ The recommendation of longer periods of known rents reflected a desire by lessees to avoid what they perceived to be ruinous increases in lease rents paid by those businesses whose lease renegotiation dates just happened to occur near or just after the peak of the market circa 1990. Once again, the Legislature did not seriously consider changes in the law based on this recommendation.⁹

The Task Force’s fifth recommendation concerned a widely-held grievance regarding the State of Hawaii’s tax policies regarding lease rents. The Task Force recommended that the State of Hawaii exempt lease payments from being subject to the general excise tax (GET) if the lessor uses them “to pay real property taxes owed to the counties”. The recommendation reflects a well-known principle of public finance, that the incidence of the GET

8 As I explain below, this is because the percentage increase in the cost of the structure was less than the percentage increase in the price of property.

9 Mandatory extension of renegotiation dates for leasehold contracts would most likely have had to be limited to provisions in newly made leasehold contracts. A mandatory extension applicable to existing contracts would probably have violated the contract clause of the U.S. Constitution (“No State shall ... pass any Bill of Attainder, ex post facto Law, or Law impairing the Obligation of Contracts, ...”).

(i.e., who bears the burden of the tax) should be as independent as possible from the organization of business activity in an industry, e.g., whether a business adds a narrow slice of value to a product or is deeply vertically integrated and provides the entire product. Consider now the case of a business that owns rather than leases its land. Its payment of the county property tax due on the land would not be subject to GET taxation, a saving of 4 percent on their property tax bill through 2006 and a saving of 4.5 percent from 2007, when a 0.5 percent increase in the GET was implemented to finance the Honolulu Rail Transit project. The GET charged on lessee property tax payments clearly raises a lessee's costs of operating its business relative to a similarly situated business that owns the same parcel of land. Hawaii legislators have long been aware of this horizontal inequity in the tax system but have failed to pass legislature to remedy it since the 1993 Report.¹⁰

In his 2003 report for the Legislative Reference Bureau (*Real Property Leases*), attorney Eric Maehara noted that the Hawaii Legislature had not adopted any of the five recommendations outlined in the Task Force's 1993 report.¹¹ Since 2003, bills have been regularly introduced in the Legislature to reform the process of renegotiating commercial and industrial land leases or to provide for mandatory lease-to-fee conversion of leasehold business property.

Mandatory lease-to-fee conversion has always been a controversial subject in Hawaii. The State's 1967 Land Reform Act provided for lease-to-fee conversion of owner-occupied single-family homes. Most eligible owners of homes on leased land exercised their new legal option to purchase their land lease (via the State of Hawaii's condemnation procedures) and gain fee simple ownership. This was not surprising as the Land Reform Act was passed during a period when the Hawaii economy was booming and land and housing pricing were rising rapidly. In 1991, the City and County of Honolulu passed its own land reform measure providing for lease-to-fee conversion of owner-occupied condominiums. Over the next 14 years, the majority of condo owners covered by the law exercised their new legal option to purchase leased lands.¹²

One factor underpinning the passage of both laws was that leasehold housing was an unusual institution in the United States, and there was widespread support in Hawaii after statehood for the introduction of housing institutions that more closely resembled the standard package of fee simple property rights encompassing both home and land is observed almost universally on the U.S. mainland. Support for a business lease-to-fee conversion law has always been more muted than support for residential conversion laws, in part because commercial and industries properties on the U.S. mainland are commonly located on leased land. The lack of success that the previous condominium and single-family home conversion measures had in reducing residential housing prices in Hawaii was surely another factor behind the Legislature's reluctance during the 2000s to address leasehold conversion for commercial and industrial lessees. More fundamentally, political opposition to leasehold conversion markedly

10 One reason that the Hawaii Legislature may not have addressed these complaints is that Hawaii lessees cannot easily evade the tax by buying leased lands. Most are not for sale. While the provision violates horizontal equity of taxation across firms, it is effective in raising tax revenue from land lessees.

11 Eric Maehara (2003). *Real Property Leases*. Legislative Reference Bureau, Report No. 5, 2003.

12 See Thomas J. Mitrano, Facilitator's Report. Honolulu City Council Leasehold Conversion Task Group, April 2, 2004.

increased in the late 1990s and early 2000s, with the movement achieving a big legislative victory in 2005 when the City Council repealed Honolulu's condominium leasehold conversion law.¹³

In 2011, the Legislature passed Act 227. The Act addressed the 1993 Task Force's desire for more conformity of Hawaii appraisal practices with national appraisal practices. It requires "a real estate appraiser to certify compliance with the Uniform Standards of Professional Appraisal Practice when acting as an appraiser or an arbitrator in an arbitration proceeding."¹⁴

One of the major objections of lessees to the structure of their leasehold contracts was the common provision that the renegotiated lease rent could not be lower than the rent in the previous period. The "not-less-than" clause was not a particularly important factor in the Hawaii commercial and industrial land market during the high-growth decades of the 1960s, 1970s, and 1980s when land prices marched relentlessly upwards.¹⁵ The 1990s were a different story. The "not less than" clause in leasehold contracts suddenly became relevant after the large fall in prices in Hawaii residential, commercial, and industrial land markets that took place between 1991 and 1998. Lessees who reached the renegotiation date on their existing lease during the late 1990s and the early 2000s found that the "not less than" clause allowed them to continue paying their existing rent whereas renegotiation based on the standard formula using a comparable land price and the standard eight percent rate of return would have led to a lower rent. These lessees correctly argued that the higher lease rent made them less competitive with other businesses that were not subject to this provision, i.e., businesses that owned their site or had leases without the "no-less-than" clause. They argued that the higher rents led to appropriation of returns from their investments in site-specific capital, downsizing of their businesses, and, in some cases, even closure.

For businesses that entered into new leasehold contracts during the mid-to-late 1990s, the situation was very different. They locked in relatively low lease rents and, with the dramatic rise in land prices through 2006, achieved an advantage over competitors who were forced to renegotiate at the higher land prices that arose between 1999 and 2006.

Most lessees rightly perceived that the big increases in land prices during the 1970s and 1980s were at least partly due to the strong linkages between Hawaii's land and tourism markets and Japan's rapidly growing economy.¹⁶ During the 1980s, values in Japan's stock market and housing markets soared to record heights and Japan's output

13 This was partly due to improved political organization within the native Hawaiian community, with many individuals and organizations benefiting from the activities of important landowners, such as Kamehameha Schools and the Queen Lili'uokalani Trust, and to the much diminished percentage of homeowners and condo owners who leased their lands.

14 Evaluating the impact of Act 227 on leasehold negotiations and rent outcomes is beyond the scope of this study, as we have insufficient data on lease rents or composition of arbitration panels to undertake such a study.

15 An exception was the 1981-1984 period when Honolulu land and housing prices were depressed by the double-dip U.S. recession that lasted from 1980 to early 1983.

16 In their 2013 study of Hawaii housing prices, economists John Krainer and James Wilcox provide some limited econometric evidence for a 1970s/1980s/1990s linkage with Japan's economy and a 2000s linkage with the U.S. economy. Their econometric results rely, however, on analysis of a single statewide index of Hawaii housing prices and are based on time-series regressions with very few observations in each of the relevant periods of interest.

(GDP) growth rates exceeded those of most other highly developed economies. The 1980s also saw a large appreciation of the Japanese yen against the U.S. dollar, a change that increased Japanese purchasing power in the U.S. market. Together the increases in income, wealth, and the value of the yen led to big increases in the number of Japanese vacationing in Hawaii and to several waves of Japanese investment in Hawaii hotels, tourism-related businesses, and residential properties. Residential, industrial, and commercial land leases that renegotiated during the late 1980s and early 1990s also saw big increases in lease rents due to the surge in Honolulu land prices.

The experience of the 1980s made it abundantly clear that Hawaii was a typical small open economy that was susceptible to changes in the foreign economies to which it was linked. As Japanese income and wealth increased and the yen appreciated against the dollar, it was only to be expected that trade, capital flows, and asset prices in the smaller economy to which it was linked—Hawaii—would also adjust.¹⁷

The close linkage between Japan's economy and Hawaii's economy became more visible during the early 1990s when Japan's stock market and housing markets plunged in value and Japanese GDP growth fell from the 4 percent average annual rates recorded in the 1980s to the one percent average annual rates of the 1990s. The impact on Hawaii came via two different linkages. The first linkage was a sharp decline in annual expenditures by Japanese visiting Hawaii. From 1995 to 2003, total visitor days from Japanese tourists fell by one-third, from 12.33 million to just 7.92 million. The impact of the decline in visitor days was magnified by a large decline in the amount spent per day by each Japanese tourist, from \$356 in 1995 to \$227 in 1999. The combined effect from smaller visitor flows and less spending per day was huge: Total Japanese tourism spending fell from \$4.37 billion in 1995 to \$2.36 billion in 1999. The second linkage was a "sudden stop" in Japanese investment in Hawaii property markets. This was primarily due to the more than 50 percent decline in the value of the Japanese stock market over just three years, (1990-1992) and the more than 20 percent decline in Japanese housing prices during the 1990s.¹⁸

Hawaii economists have often argued that slow growth in the Japan economy markedly reduced Japanese demands for Honolulu homes and condos in the 2000s and that the big increase in Honolulu housing prices between 1999 and 2007 was instead driven by strong demand from U.S. and Hawaii residents.¹⁹ While some mainland residents may have been looking to diversify their investment portfolios in the wake of the 1999-2000 crash in the

17 Usually in a small open economy, prices in perfectly competitive markets are set in the global market; local demands do not affect the prices. In tradable product markets, goods will be shipped across markets to account for changes in local market demand and supply. In tradable service markets, such as tourism, consumers will travel to different destinations as prices vary. Metropolitan markets for industrial, commercial and residential land are more stylized, yet still involve mobile buyers and renters who will move into other markets as prices increase in one market. However, lands in Honolulu and other U.S. and foreign metropolitan areas do not collectively constitute one perfectly competitive global market because for most actual and potential buyers and renters, land in one metropolitan area is not a close substitute for land in another metropolitan area, e.g., land in Honolulu is not a close substitute for land in San Francisco which is not a close substitute for land in Chicago. Thus, a downward-sloping international demand for land in Honolulu opens the door for demand by Honolulu residents to affect the price of land in Honolulu.

18 Japan's housing market would drop another 20 percent in value between 2000 and 2009. The 19-year decline in home values is one of the longest ever observed in a developed economy. See Augustín S. Bénétrix, Barry Eichengreen, and Kevin H. O'Rourke (2012), "How Housing Slumps End." *Economic Policy* 72: 649-92.

19 Again, see Krainer and Wilcox (2013) for an econometric study of these propositions.

NASDAQ stock market, low U.S. mortgage rates and healthy increases in Hawaii incomes during the 1999-2006 period were likely the main reasons behind increased buyer willingness to pay for Honolulu homes and condos.

The declines in Hawaii housing prices between 2007 and 2009 clearly has roots in the Great Recession of 2007-2009 in Hawaii and the United States, while increases in these prices has roots in the sustained recovery of both the U.S. and Hawaii economies since 2009. The closer linkage of Hawaii land and housing prices and the U.S. economy from the late 1990s raises the question of how distinct changes in Hawaii residential, commercial, and industrial land prices are from changes in U.S. land and housing markets.

New Advances in Understanding U.S. Land Markets and Prices

Over the last 80 years, interest in studying the value of U.S. land has fluctuated enormously among economists, with the last 15 years seeing a new surge in studies. The measurement of U.S. land prices and values was a major concern for economists from the 1930s to the 1950s, as they built new national accounts measuring output and wealth (Davis, p. 350). However, from the early 1960s to the mid-1990s, just one paper was published on the topic.²⁰ In the late 1990s and early 2000s, a new literature emerged to examine the value of land in residential, industrial, and commercial markets.²¹ The new research efforts were fueled in part by the emergence and development of new data sources on housing and land prices and in part by the big increases in land and housing prices that took place throughout the United States from the mid-1990s through the mid-2000s.

One strand of this new literature focused on sales prices and construction costs in residential markets, with several studies attempting to determine the share of the price of housing due to the price of the land and the share due to the cost of building the home. These “residual” studies derived residential land prices for large metropolitan areas, regions, and the mainland United States.²² A second strand of the literature uses transaction data on vacant lots and their characteristics to derive a quality-adjusted value of land in residential, industrial, and commercial

20 A separate literature in agricultural economics focuses on the value of agricultural lands.

21 For representative examples, see Edward Glaeser, Joseph Gyourko, and Raven Saks (2005), “Why is Manhattan So Expensive? Regulation and the Rise in House Prices,” *Journal of Law and Economics* 48(2): 331-370; Stephen Malpezzi (1996), “Housing Prices, Externalities, and ,” *Journal of Housing Research* 7(2): 209-241; Stephen Malpezzi, Gregory H. Chun and Richard K. Green (1998), “New Place-to-Place Housing Price Indexes for U.S. Metropolitan Areas, and Their Determinants,” *Real Estate Economics* 26(2) June: 235-274; Christopher Mayer and C. Suriel Somerville (2000), “Residential construction: using the urban growth model to estimate housing supply,” *Journal of Urban Economics* 48, 85-109; Henry O. Pollakowski and Susan M. Wachter (1990), “The Effect of Land-Use Constraints on Housing Prices,” *Land Economics* 66: 315-324; and John M. Quigley and Steven Raphael (2005), “Regulation and the high cost of housing in California,” *American Economic Review* 95(2): 323-328.

22 See Morris A. Davis and Jonathan Heathcote (2005), “Housing and the Business Cycle,” *International Economic Review* 46(3): 751-784; Morris A. Davis and Jonathan Heathcote (2007), “The price and quantity of residential land in the United States,” *Journal of Monetary Economics* 54(8): 2595-2620; Morris A. Davis and Michael G. Palumbo (2008), “The price of residential land in large US cities,” *Journal of Urban Economics* 63(1): 352-384; and Albert Saiz (2010), “The geographic determinants of housing supply,” *Quarterly Journal of Economics* 125(3): 1253-1296.

real estate markets at the national level.²³ A third strand of the literature also uses transaction data on vacant lots to derive a quality-adjusted value of land for residential and commercial real estate markets in large U.S. metropolitan areas. I review major studies in each of these literatures below.

Studies of residual land prices are important because of the new land price data they have assembled for a variety of U.S. markets and because they are the original source of the Land Leverage Hypothesis. In their 2007 study, urban economists Raphael Bostic, Stanley Longhofer, and Christian Redfearn developed the idea that changes in a property's value will depend critically on the respective shares of the structure and land in the property price.²⁴ The value of the structure is determined by its replacement cost adjusted for depreciation. The critical insight is that the structure "can never appreciate at a rate above the increase in construction costs." This places a cap on the potential value of the structure and allows us to derive – as a residual – the minimum share of land in the property's value.²⁵ Bostic and coauthors use this insight to develop the Land Leverage Hypothesis, the idea that potential changes in the value of a property depend critically on the share of land in the property. Properties in which land is a higher share of property value are capable of having much higher swings in value than properties in which the structure takes a higher share of the property value.

In their 2008 study, urban economists Morris Davis and Jonathan Heathcote developed a national land price index for residential land that builds on the Bostic *et al.* model.²⁶ Their land price index is derived from a theoretical model of asset prices that specifies relationships between overall residential housing prices, land prices and the cost of the structure (the "home"). The model allows Davis and Heathcote to use data on housing construction costs and housing prices to derive a "residual" price of land, i.e., a price essentially derived by subtracting the replacement cost of the home (adjusted for depreciation) from the full housing price. A major finding from the Davis and Heathcote study is that increases in housing prices between 1980 and 2004 were largest in those metropolitan areas where the share of land in housing prices was already relatively high in 1980. A second major finding is that housing prices and land prices tended to be more volatile in those regions where the share of land in the full housing price was higher. This means that "house-price dynamics should be quite different in regions where the value of

23 See David Barker (2007), "Urban Land Rents in the United States". In *Land Policies and Their Outcomes*, edited by Gregory K. Ingram and Yu-Hung Hong. Cambridge, MA: Lincoln Institute of Land Policy; and Karl E. Case (2007), "The Value of Land in the United States: 1975-2005". In *Land Policies and Their Outcomes*, edited by Gregory K. Ingram and Yu-Hung Hong. Cambridge, MA: Lincoln Institute of Land Policy; David R. Barker and Jay Sa-Aadu (2004), "Real Estate Becoming Important Again? A Neo-Recardian Model of Land Rent," *Real Estate Economics*, 32: 33-54; C.F. Sirmans and Barrett A. Slade (2012), "National transaction-based land price indices." *The Journal of Real Estate Finance and Economics* 45(4): 829-845; and Joseph B. Nichols, Stephen D. Oliner, and Michael R. Mulhall (2013), "Swings in commercial and residential land prices in the United States." *Journal of Urban Economics* 73(1): 57-76.

24 See Raphael W. Bostic, Stanley D. Longhofer, and Christian L. Redfearn (2007), "Land leverage: decomposing home price dynamics." *Real Estate Economics* 35(2): 183-208, particularly 183-186.

25 One exception is that a structure's value could exceed its replacement costs if it has value as an "historic" structure. In this case, the age and particular architectural style of the building become an amenity that is valued independently of the state of the building (Bostic, *et al.* 2007, p. 186).

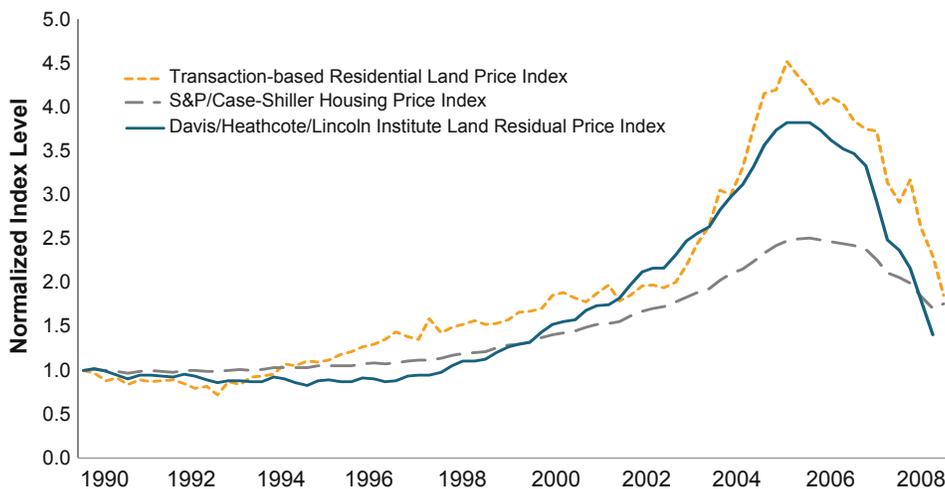
26 In another 2007 study, Davis and Heathcote developed a model to explore a relationship between the dynamics of house prices, land prices and structural costs. They show that fluctuations in residential land prices can explain most of the variation in U.S. housing prices from 1975 to 2006.

housing is largely accounted for by the value of land (such as San Francisco and Boston) compared to regions where land's share of house value is relatively small" (p. 2598). A perhaps more intuitive way of looking at this finding is to look at it from the perspective of changes in the cost of building the home ("the structure"): Because the cost of building structures has not been particularly volatile (increasing over time, but not subject to big swings), it was left to big swings in the price of land to drive big swings in the price of housing.

The 2007 study by Davis and Heathcote and the 2008 study by Davis and Palumbo only looked at residential land prices. A 2009 study by Davis expanded the scope of this literature by constructing estimates of the price and share of four different types of land from the Federal Reserve Board of Governor's Flow of Funds Accounts: residential and nonprofit, noncorporate (apartment units owned by individuals and partnerships), nonfinancial corporate, and financial corporate. One major finding is that land's share in the value of real estate generally rose for residential and nonprofit land and noncorporate land from 13 percent in 1952 to about 40 percent in 2007 period, while land's share in the value of real estate for both types of corporate land fell to near zero between 1990 and 1995, before making an almost full recovery to its earlier share (~27 percent). Inflation-adjusted price indexes for each type of land "share similar historical patterns with the land-share data" described above (p. 355). A significant finding of their analysis is that commercial and residential land prices and shares evolved quite differently over the 55-year study period.

Two other major studies of U.S. land prices – a 2012 study by economists C.F. Sirmans and Barrett Slade and a 2013 study by economists Joseph Nichols, Stephen Oliner, and Michael Mulhall – have substantially increased our understanding of how U.S. land markets actually work by developing national and metropolitan area price indexes for land in several types of uses. Repeat sales indexes for national and metropolitan area housing prices have been available to market participants since the early 1990s. Think, for examples, the S&P/Case-Shiller Index and the National Council of Real Estate Investment Fiduciaries (NCREIF) Property Index. By contrast, indexes for land prices only became available in 2008 with the launching of the Davis-Heathcote Residual Land Price Index. The

Figure 1: Price Indexes for U.S. Industrial Land and Property, 1990-2009



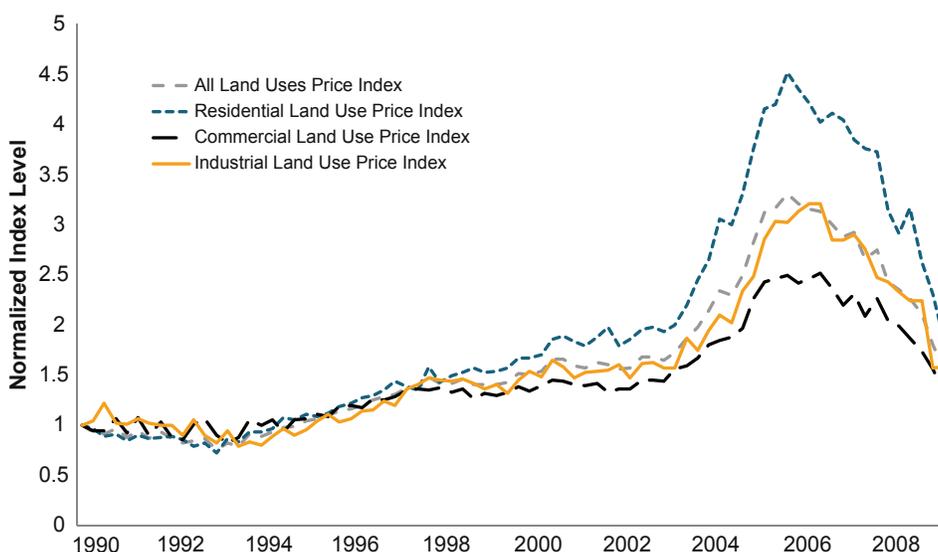
SOURCE: SIRMANS AND SLADE (2012).

two studies by Sirmans and Slade and by Nichols and coauthors add to our understanding of U.S. land prices because they approach the problem from a completely different perspective, taking advantage of a huge new data set covering individual properties across many U.S. metropolitan areas. Both use real estate market data collected by CoStar, Inc. to analyze transactions on vacant land zoned for different types of uses. Honolulu was not one of the metropolitan areas specifically analyzed in these studies, but a comparison of results from the two studies with market conditions in Honolulu provides a suggestive roadmap for understanding how Honolulu's land markets work.

The Sirmans and Slade Index uses transaction prices to develop land price indices for vacant lands zoned for three different types of uses: residential, commercial, and industrial. No other studies have developed comparable indexes covering all three major types of land uses. Their quarterly index spans the period January 1990 through June 2009, with prices of individual lots adjusted to control for location, physical characteristics and other characteristics that might affect their prices. Sirmans and Slade also split industrial property prices into their component parts, the value of the land and the value of the structure (Figure 2). Analysis of the Sirmans and Slade land indexes yields three key findings. One finding is that prices in U.S. residential and industrial land markets tended to move closely together over the 1990-2009 period. Trends observed in the more closely monitored and measured residential land market were the same trends found in the industrial land market. A second finding is that all prices in all three land markets were volatile – flat in the early-to-mid 1990s, rising at an increasing pace through the mid-2000s and then falling sharply between 2005 and 2009 to levels observed in the mid-1990s. A third finding is that commercial land prices followed the general patterns found in the residential and industrial markets, but were much less volatile, rising less in the 1995-2005 period and falling less in the 2005-2009 period.

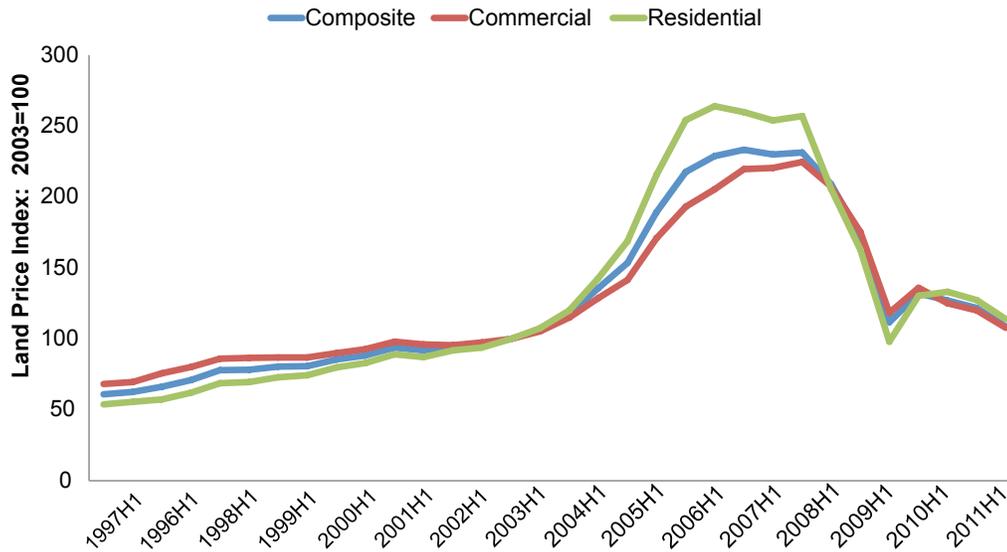
The Nichols, Oliner, and Mulhall study is somewhat similar to the Sirmans and Slade study –they both use Co-Star data on land sales – and somewhat different. Nichols *et al.* differ in that the time period covered is shorter (mid-

Figure 2: Land Price Indexes for U.S. Residential, Commercial and Industrial Land, 1990 - 2010



SOURCE: SIRMANS AND SLADE (2012).

Figure 3: Indexes for U.S. Commercial and Residential Land, 1995-2011



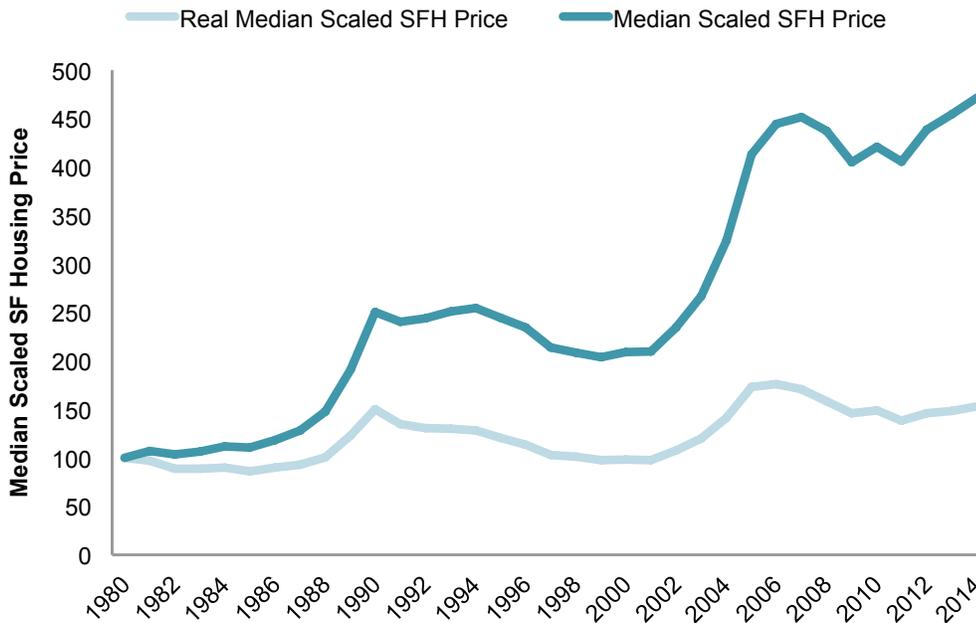
SOURCE: NICHOLS *ET AL* (2013).

to-late 1990s to 2011), they include just two (rather than three) categories of land use, commercial and residential, and they report indexes from 23 large U.S. metropolitan areas (rather than only national indexes).²⁷ Their findings with respect to the national market are similar to the Sirmans and Slade findings: National commercial and residential indexes follow the same general pattern between the mid-to-late 1990s and 2011, with the exception of the 2003-2007 period when residential prices increased much faster. Comparison of land price data for the 23 MSAs yields two key results (Figure 3). One is that “[t]he magnitude of the run-up and the subsequent decline differs across the MSAs, with the largest movements in MSAs on the East Coast and in the Far West.” A second key result, one that is also found in other studies of MSA land prices, is that the swings in land prices indexes for their 23 MSAs were much larger than the swings in major indexes of commercial real estate and housing prices.²⁸

27 Nichols *et al.* (2013) do not consider industrial land markets in their study.

28 Two earlier models provide foundations for the models discussed in the text. Barker and Sa-Aadu (2004) provide a theoretical framework to explain increases in land prices and develop a simple model of the share of land rent in national income. They use a relatively low level of income elasticity, 0.4, in 1929 and assume it to increase proportionally with income. As a high value of income elasticity, they use 1.5. Their model with variable income of elasticity of demand predicts slow increases in the share of rent in national income, which is consistent with the National Income and Product Account data. It predicts slow increases in the share of rent in national income, from less than 5 percent today to 29 percent in 2075. These estimates are, however, highly sensitive to choice of income and price elasticities, with the predicted share of land value in national income reaching just 13 percent in 2100 if the model does not allow income elasticity to increase above 1.5. Case (2007) estimated the values of residential and nonresidential lands in the U.S. from 1975 and 2005 by separating the replacement cost of structures from total asset value. From 1975 to 1990, the value of land in nonresidential real estate rose from \$400 billion to \$1.3 trillion. A decline occurred over the 1990-1995 period as structure replacement costs rose. From just \$238 billion in 1995, land values soared to \$1.3 trillion as total asset value rose faster than replacement costs for structures. Case (2007) and Barker (2007) use the FOF Accounts to analyze land values. Nichols *et al.* (2013) criticize estimations using the FOF Accounts, noting they are subject to large measurement errors.

Figure 4: Nominal and Real Honolulu Single-Family Home Media Price, 1980-2014

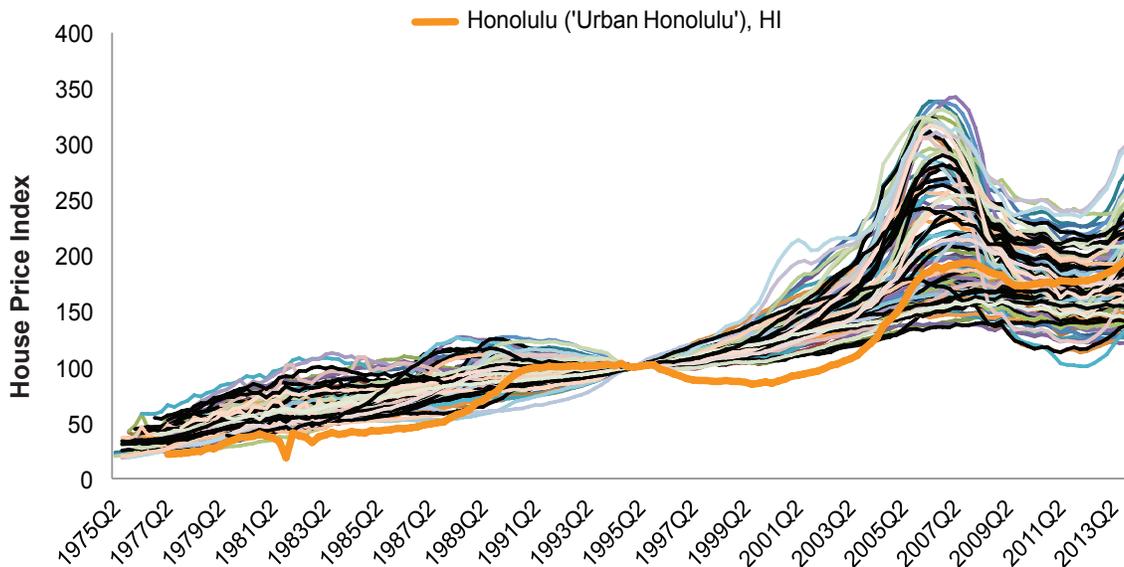


SOURCE: MEDIAN SINGLE-FAMILY HOME PRICES ARE FROM OFFICE OF FEDERAL HOUSING ENTERPRISE OVERSIGHT (OFHEO). THE HOME PRICE SERIES IS DEFLATED BY THE HONOLULU CONSUMER PRICE INDEX.

Have residential, commercial and industrial prices in Honolulu followed national patterns? It's not an easy comparison to make for at least two reasons. First, we do not have carefully constructed indexes of commercial and industrial land prices for Honolulu. Second, the data series that we have for commercial and industrial property prices in Honolulu do not overlap well with the carefully constructed national series.

What do we know about prices of residential, commercial and industrial properties in Honolulu? We know that Honolulu single family home prices are high (discussed below) and have been quite volatile over the medium-term for the last thirty-five years. To isolate the issue of volatility, I present scaled data on undeflated and deflated single-family home median prices in Figure 4. If we were just to look at undeflated market prices, Honolulu would seem to be a booming housing market in which home prices have soared to levels more than 4.5 times higher than they were in 1980. A look at the home price data deflated by the Honolulu Consumer Price Index tells a different story. Over the 35-year period, the real price of a single family home has increased by roughly 50 percent. During this time, the market was subject to five waves of booms and busts. All of the real appreciation in the market occurred in the 1980s, with a 50 percent appreciation reached in 1990. But during the 1990s, the market gave up all of its gains, returning to its initial starting position in 1980. From 2000 to 2006, the market experienced its biggest boom, increasing in value by roughly 70 percent. From 2006 to 2011, the market fell again, stabilizing at a level about 50 percent above the 1980 and 2000 levels. A glance at Figure 4 makes it clear that in the short run, Hawaii home prices have not been particularly volatile. But in the medium-run, over a 10-15 year period, they have been very volatile, with the market subject to several sharp reversals in direction of real prices.

Figure 5: FHFA House Price Index (non-seasonally adjusted) for 100 Largest MSAs:1975Q2 - 2014Q1 (All-transactions), 1995=100



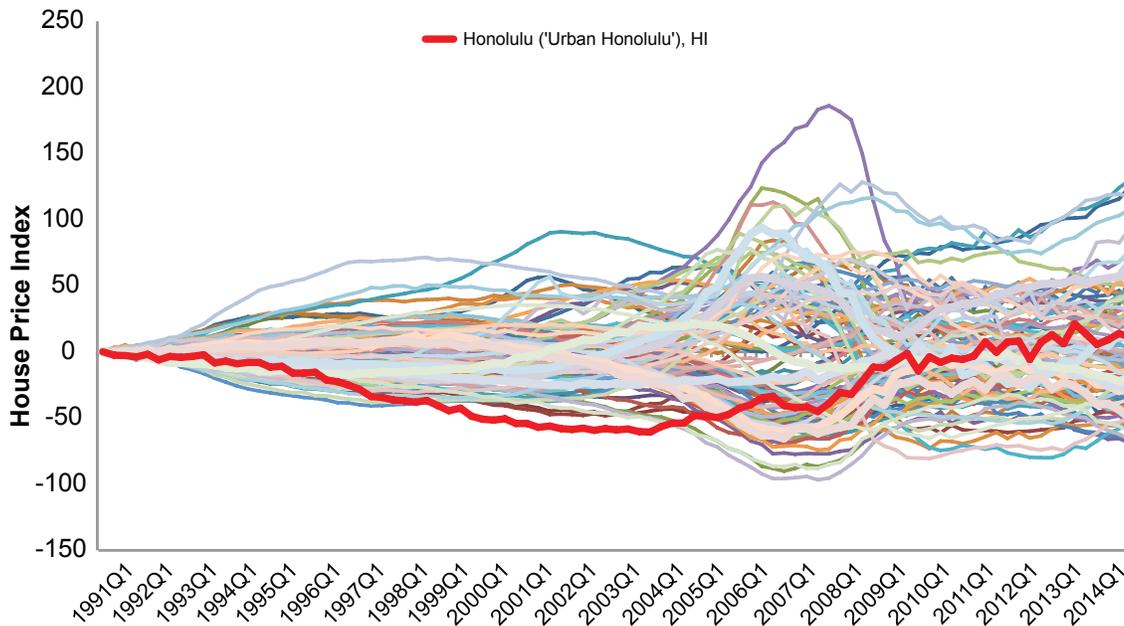
SOURCE: QUARTERLY HOUSING PRICE INDEX (HPI) ISSUED BY FEDERAL HOUSING FINANCE AGENCY. [HTTP://WWW.FHFA.GOV/DATATOOLS/DOWNLOADS/PAGES/HOUSE-PRICE-INDEX.ASPX](http://www.fhfa.gov/datatools/downloads/pages/house-price-index.aspx).

The volatile market has consequences for those purchasing a home (and the land) for the medium term and for those purchasing a leasehold property subject to renegotiation. The volatility in the market means that your inflation-adjusted return on housing is highly dependent on when you invested in the housing. If you bought in 1980 and sold in 1990, you enjoyed a 50 percent inflation-adjusted gain for the decade. If you bought in 1990 and sold in 2000, you suffered a 50 percent inflation-adjusted loss for the decade. If you bought in 2005 and sold in 2015, the market price of your home increased substantially, but the inflation-adjusted price did not.

The same difficulties apply to those who lease commercial, residential, and industrial land and have renegotiation clauses in their leases. Lessees who negotiate or renegotiate their leases in different phases of the land market often pay very different rents than those who negotiated five, ten, or fifteen years earlier. When the lease renegotiation date happens to fall during a year with low land prices (e.g., 1999), the renegotiated rent could be up to 50 percent lower than for leases which renegotiated in 1990. For businesses, a relatively high rent has the potential to extract normal profits of the business, while a relatively low rent has the potential to provide it with advantages over similarly situated competitors who renegotiated at a different time.

Figures 5 and 6 help to situate Honolulu's home prices with those in other U.S. metropolitan areas. Figure 5 reports the FHFA House Price Index for the 100 largest metropolitan areas, with Honolulu the thick black line in the figure. The FHFA Index is scaled so that its value equals 100 for all metropolitan areas in 1995, making it easier to see how prices changed across cities. Figure 5 neatly displays the run-up in Honolulu home prices during the 1980s relative to other cities, the fall in home prices during the 1990s relative to other cities, and the closer correspondence to trends in other cities from the early 2000s. Figure 6 displays detrended home price data from the FHFA House

Figure 6: Detrended House Price Index for 100 Largest MSA from 1991Q1 to 2014Q1
(Purchase-only Index), 1991=100



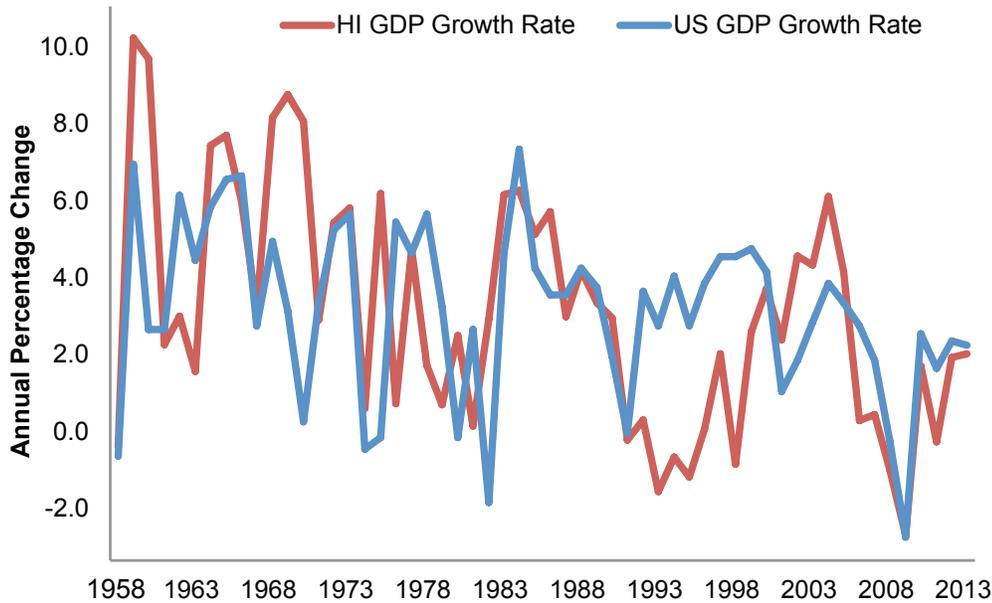
SOURCE: QUARTERLY HOUSING PRICE INDEX (HPI) ISSUED BY FEDERAL HOUSING FINANCE AGENCY.
[HTTP://WWW.FHFA.GOV/DATATOOLS/DOWNLOADS/PAGES/HOUSE-PRICE-INDEX.ASPX](http://www.fhfa.gov/datatools/downloads/pages/house-price-index.aspx).

Price Index for 1991. It clearly shows the long decline in the Honolulu housing market during the 1990s relative to trend, and its transition to lower volatility relative to other U.S. cities from the mid-2000s.

What accounts for the volatility of the housing market in Honolulu over the last 50-60 years? Most economists studying the Hawaii economy trace it back to the booming post-statehood period of the 1960s and the deep, long recession of the 1990s. Figure 7 plots real GDP growth rates for the Hawaii and U.S. economies and at the glance at the figure shows the stark differences over the 1960s and 1990s decade. The strong 1960s performance boom can be rationalized by the positive shocks to tourism resulting from the introduction of the jet plane in 1958 and the tremendous improvement in the structure and performance of its governments following statehood. The extremely weak decade of the 1990s is more difficult for someone interested in the state's future to consider. Was the decade an aberration that is unlikely to be repeated? Or is it better thought of as a "sudden-stop", a reaction to a variety of U.S. and international shocks that hit Hawaii throughout the 1990s? Two recent cross-country empirical studies are suggestive. They find that small open economies which are less diversified in their economic activities are more vulnerable to economic shocks than those which are more diversified.²⁹

29 Mona Haddad, James Jerome Lim, Cosimo Pancaro, and Christian Saborowski (2013), "Trade openness reduces growth volatility when countries are well diversified," *Canadian Journal of Economics* 46(2): 765-790; and Julian di Giovanni and Andrei A. Levshenko (2012), "Country Size, International Trade, and Aggregate Fluctuations in Granular Economies," *Journal of Political Economy* 120(6): 1083-1132. Between 1984 and 2007, the volatility of the U.S. economy and most state economies declined substantially. Hawaii was, however, one of 14 states to experience an increase in volatility in the 1985-1997 period compared to the 1978-1984 period. See Bruce T. Grimm and Brian K. Sliker (2009), *Declines in the Volatility of the US Economy: A Detailed Look*. Washington, D.C.: Bureau of Economic Analysis, May 2009.

Figure 7: U.S. and Hawaii Real GDP Growth Rates, 1958-2013

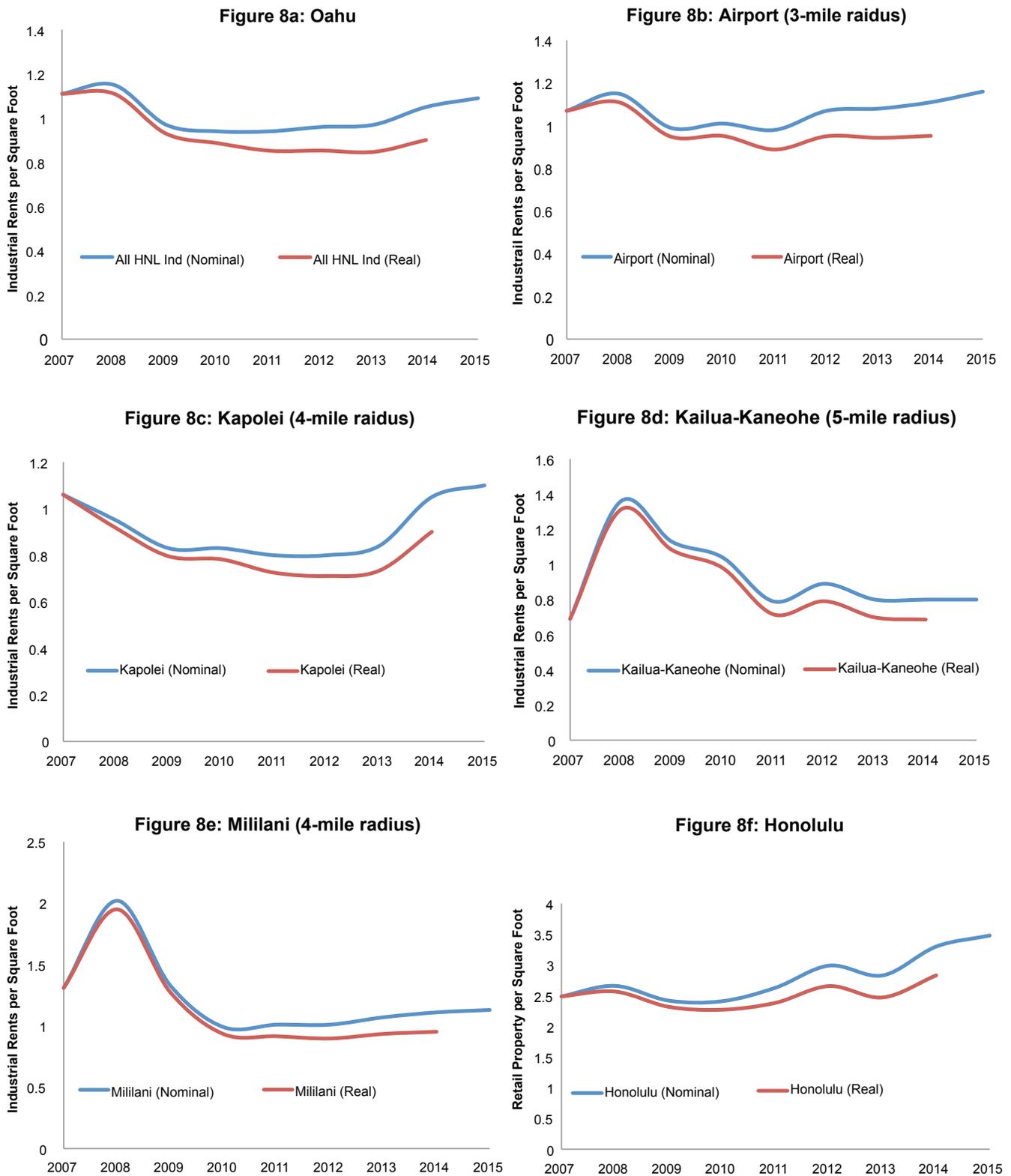


SOURCE: HAWAII REAL GDP GROWTH RATES WERE DEFLATED BY THE HONOLULU CONSUMER PRICE INDEX FOR THE 1963-2013 PERIOD. FOR 1958-1963, NOMINAL HAWAII GDP WAS DEFLATED BY THE HONOLULU CPI SERIES WHICH EXCLUDES THE PRICE OF HOUSING. THE U.S. REAL GDP SERIES IS IN CHAINED 2009 DOLLARS AND IS TAKEN FROM FRED, THE ECONOMIC DATA BASE MAINTAINED BY THE FEDERAL RESERVE BANK OF ST. LOUIS.

Price data on commercial and industrial properties in Hawaii are more limited than for residential properties. The various panels in Figure 8 display prices (per square foot) of industrial properties across the island of Oahu and in selected parts of the island available for lease. The data are from the CoStar Analytics data base for Honolulu commercial and industrial properties; the period of coverage is January 2007 to May 2015. The limited coverage makes them difficult to compare with U.S. industrial and commercial prices indexes (discussed earlier in this section, Figures 1-3), because there is just a four-year overlap (2007-2010) in coverage. Nonetheless, the trends are similar, with national prices peaking in 2006/2007 and falling through 2010. Honolulu prices follow a similar pattern, declining almost 20 percent from peaks in 2007 to troughs in the 2009-2011 period. A slow price recovery begins in 2009/2010 and accelerates in 2014 and 2015.

As with the residential series, deflating the industrial price series by the Honolulu Consumer Price Index changes the story a bit. Despite the downturn in the Hawaii economy over the 2007-2009 period, consumer prices rose in Honolulu in 2007 (4.6 percent), 2008 (3.5 percent), and 2009 (0.7 percent). Inflation was also substantial during the five-years of recovery for which we have data, averaging 2.2 percent over the 2010-2014 period. In each of the five geographic clusters examined, the decline in the real price between 2007 and 2011 is larger than the decline in the nominal price because of the effects of inflation. From the beginning of the home price decline through recovery in 2014, the Honolulu CPI rose by 15.3 percent, contributing to a slow recovery in the real industrial price series.

Figure 8: Price (per square foot) of Industrial Properties on Oahu



2015 DATA ARE THROUGH MAY 2015. SERIES ARE DEFLATED BY THE HONOLULU CPI. OBSERVATIONS FOR 2007-2014 ARE FROM THE 4TH QUARTER OF EACH YEAR.

Why Were Land Prices so High in Honolulu in the 1960s and in the 2010s?

The high median Honolulu single-family home price observed in September 2015 is quite astounding: \$699,000 (Table 1). This is close to the highest nominal median price yet seen in Honolulu (\$703,000 in January 2015), and it ranks among the three highest median prices in the United States in 2015(Q2), exceeded only by those in San Jose, San Francisco, and Anaheim, California. Other high-priced markets are much cheaper than Honolulu, with the number eight market—Los Angeles-Long Beach-Santa Ana—registering a median price of \$445,000 (Table 1). The median price of a single-family home in metropolitan areas in the Western United States is even lower, just \$296,000.

Table 1: Median Sales Price (\$1,000) of Existing Single-Family Homes in 13 U.S. Metropolitan Areas with Highest Prices, 2015:Q2

Washington-Arlington-Alexandria, DC-VA-MD-WV	\$404
New York-Northern New Jersey-Long Island, NY-NJ-PA	\$410
Boston-Cambridge-Quincy, MA-NH	\$415
Naples-Marco Island, FL	\$423
NY: Nassau-Suffolk, NY	\$430
Los Angeles-Long Beach-Santa Ana, CA	\$445
Boulder, CO	\$464
New York-Wayne-White Plains, NY-NJ	\$473
San Diego-Carlsbad-San Marcos, CA	\$548
Honolulu, HI	\$699
Anaheim-Santa Ana-Irvine, CA	\$713
San Francisco-Oakland-Fremont, CA	\$842
San Jose-Sunnyvale-Santa Clara, CA	\$980
United States	\$229
U.S. West	\$352

SOURCE: NATIONAL ASSOCIATION OF REALTORS AT [HTTP://WWW.REALTOR.ORG/TOPICS/METROPOLITAN-MEDIAN-AREA-PRICES-AND-AFFORDABILITY](http://www.realtor.org/topics/metropolitan-median-area-prices-and-affordability).

It is critical to put some historical perspective on the record 2015 Honolulu home prices. High Honolulu housing prices did not just appear in the last two, three or four decades. U.S. census data show that average housing prices in the State of Hawaii were higher in 1950 than those in all other U.S. states (Table 2). The high historical prices tell us that at least some of the explanations for today's high housing prices were present at the start of the statehood era. A look at earlier discussions of high pricing prices shows that several factors that were discussed in the 1960s are still being discussed today.

Table 2: Median Price of Single-Family Homes

Census Year	2000	1990	1980	1970	1960	1950
Nominal Price	\$272,700	\$245,300	\$118,100	\$35,100	\$20,900	\$12,283
CPI-Adj. Price	\$272,700	\$313,400	\$233,800	\$134,800	\$103,000	\$74,400
CPI-Adj. Factor	1.00	1.28	1.98	3.84	4.93	6.06

SOURCE: U.S. CENSUS

One could well argue that Hawaii's long history of concentrated land ownership lies behind Hawaii high prices. Land ownership on Oahu after the Māhele created many large and small land owners, but concentration of land ownership was not sufficiently high to raise any concerns about market power in the land market. Many of the lands assigned to the government were sold after the Māhele, placing more land in private ownership and allowing more access to land by the native Hawaiian population and the ascendant sugar plantations. In the century between the Māhele and statehood, the concentration of private land ownership increased substantially. One reason was that sugar plantations, pineapple plantations, and large ranches all purchased substantial tracts of land on the private market to assemble land holdings allowing operations that took advantage of economies of scale. A second reason was the decision made by many prominent ali'i in the late nineteenth century to consolidate their private lands in larger estates structured to provide services to native Hawaiian beneficiaries. And a third reason was the consolidation of land in U.S. military bases after Hawaii became a territory and during World War II.

Don Wallace, in a recent article in Honolulu Magazine, finds that the list of top 20 land holders in 2013 is similar to the list compiled by City Department of Permitting and Planning in 1985. Concentrated land ownership is, however, just one of three possible restrictions on supply that can be dated back to the 1950s and 1960s. The other two land supply restrictions that very likely affected land and housing prices in Honolulu were land use regulations and natural restrictions on the supply of developable land. Consider first restrictions imposed by nature, as Honolulu, which is coterminous with the island of O'ahu, is a small island of little more than 380,000 acres. In 1989, University of Hawaii economist Louis Rose published a pioneering article in which he computed an index of urban land supply that adjusted land availability in U.S. metropolitan areas for the presence of large bodies of water.³⁰ The Honolulu land supply index had the lowest value of any major U.S. urban area, with just 47 percent of the land available to a urban area located on a featureless plain without any bodies of water on the landscape, e.g., St. Louis or Denver. Two University of Hawaii economists, Sumner La Croix and Louis Rose, then employed the newly developed urban land supply index in a 1989 econometric study of land site prices covering the 39 largest U.S. cities for the year 1980.³¹ Controlling for a number of other factors such as population, population

30 Louis A. Rose (1989), "Topographical Constraints and Urban Land Supply Indexes," *Journal of Urban Economics* 26: 335–347.

31 Louis A. Rose and Sumner J. La Croix (1989), "Urban Land Price: The Extraordinary Case of Honolulu, Hawaii," *Urban Studies* 26: 301-314. We dropped Houston from the sample because it has no zoning.

growth, income per capita, foreign investment, zoning power, and city amenities, our econometric analysis found a negative and statistically significant relationship between the natural supply of urban land and its price. Use of our econometric results to simulate the effect of natural restrictions on the price of land in Honolulu in 1980 yielded a predicted premium of 35 percent for Honolulu's land site prices.

Rose and La Croix's 1989 study also considered how state and local regulations affected land prices. We concluded that landowners in Honolulu were subject to the most severe land use restrictions in the United States. The extreme regulatory environment was due to two distinct, overlapping zoning monopolies—one at the state level and one at the city level, each of which provided separate regulations on land use throughout the entire island. Developers usually had to obtain approval for a housing project from both authorities. This double veto increased the likelihood that any given project to develop land for housing would ultimately not be approved or even proposed. Because a smaller flow of new housing projects leads to smaller increases in the stock of housing over time, market-clearing housing prices will need to be higher to accommodate demand.

In 2015 many states impose some form of regulation on land development. State government regulation of land development inside U.S. metropolitan areas was, however, extremely rare before the mid-1980s. In fact, the State of Hawaii was a pioneer in imposing such regulations on urban development. In 1961, passage of the Land Use Law had established the State Land Use Commission, which was charged with implementing a system of statewide land use regulations.³² The first law of its type in the United States, it classified land into four broad categories of uses, within which zoning regulations of the City and County of Honolulu provided more detailed rules for land use. The urban core in Honolulu was (and is) surrounded by land zoned for agricultural use, and developing these lands for housing required reclassification by the Land Use Commission.

Once state-level restrictions on land use had been determined, the City and County of Honolulu implemented several additional layers of zoning regulation. Honolulu's zoning framework was set forth in the Comprehensive Zoning Code administered by the city's Department of Land Utilization (DLU), and in the Shoreline Management Act under which the City Council approved or denied most development proposals. There were also permitting requirements specified in subdivision and grading ordinances administered by the DLU and a building code administered by the Honolulu Building Department.

Over the last 50 years, zoning regulation in Honolulu has provided county officials and bureaucrats with far more power than officials in other U.S. metropolitan areas to affect the supply of housing. This is not because zoning regulations in Honolulu explicitly provided officials with more discretion to apply the regulations or because zoning was much tougher than those in other cities. Rather the extra power in the hands of Honolulu officials was due to the concentration of zoning power in just one local government: The City and County of Honolulu.³³ Consumers and developers who do not like zoning decisions made by the Honolulu government must either move to neighbor islands or thousands of miles to the U.S. West Coast. The situation is very different when there are a

32 Chapter 205, Hawaii Revised Statutes.

33 In the mainland United States, places like Hawaii Kai, Waipahu, Nanakuli, Kailua or Kaneohe could have separate city or county governments.

large number of local governments operating within a particular metropolitan area. Competition between those governments provides consumers and developers with alternatives to living in or developing land in any particular suburb or county that chooses to adopt strict zoning rules. This is because they have the option to migrate (cheaply) to another suburb, city, or county within the same metropolitan area that has adopted less strict zoning rules.

So how does the existence of just one government for the Honolulu metropolitan area compare with other large U.S. metropolitan areas? In 1980, the average number of local governments with zoning powers in the 40 most populous U.S. metropolitan areas in 1980 was 72. At one end of the distribution, Houston had one, Charlotte two, and Tampa three. At the other end, New York had 360 and Chicago had 347.

Rose and La Croix's econometric analysis of U.S. urban land prices in 1980 included a control variable for the power of zoning to affect land prices in a metropolitan area.³⁴ Developed by the economist William Fischel, the zoning power variable measures the fraction of the urban area's land market contained by its four largest suburbs. In all of our regressions, the estimated coefficient on the zoning variable was positive and statistically significant at the five percent level. When we applied the regression results to simulate the effect of zoning power on Honolulu land prices in 1980, we found that high zoning power in Honolulu was consistent with a 34 percent premium over the average land price in the 39 largest U.S. cities.

Now recall that an application of the same regression to simulate the effect of natural restrictions on Honolulu land prices accounted for a 35 percent premium. Together, the two restrictions are consistent with a 69 percent premium in the price of land in Honolulu in 1980. The actual premium on land in 1980 for "the extraordinary case of Honolulu, Hawaii" was much, much higher: 350 percent. Rose and La Croix concluded that natural supply restrictions and land use regulations improved our understanding of high Honolulu land and housing prices but still left a lot of the puzzle unexplained.

Now fast forward 25 years to 2014. Are there new developments in our understanding of U.S. land and housing prices that might contribute to our understanding of Honolulu's market? Papers by urban economists Morris Davis, Jonathan Heathcote, Albert Saiz, and Michael Palumbo that we discussed above provide particularly important insights for understanding the role of land in both trend and cyclical changes in U.S. housing prices for specific metropolitan areas.

In 2007 economists Morris Davis and Jon Heathcote developed a model of housing prices that allowed them to estimate how much of the price of a typical U.S. home was due to the cost of the structure and how much was due to the value of the land attached to the house.³⁵ They estimated that the share of land value in the total market value of housing doubled between 1950 and 1970, from 10.4 percent to 19.9 percent.³⁶ The big increases continued

34 The mean index value in the 39-urban area sample is 0.35; values range from 0.83 in Richmond to 0.04 in Minneapolis. See William A. Fischel (1981), "Is Local Government Structure in Large Urbanized Areas Monopolistic or Competitive?" *National Tax Journal* 34: 95-104.

35 Morris A. Davis and Jonathan Heathcote (2007), "The price and quantity of residential land in the United States." *Journal of Monetary Economics* 54(8): 2595-2620. See also See Morris A. Davis and Jonathan Heathcote (2005), "Housing and the Business Cycle," *International Economic Review* 46(3): 751-784.

36 The estimate is derived using data from the U.S. Decennial Censuses of Housing on metropolitan statistical area housing

during the 1975-2006 period, with U.S. land prices almost quadrupling and the real price of structures increasing only by a third. The higher growth rates of land prices had the effect of increasing the share of residential land value in national housing prices from about 35 percent in 1975 to about 46 percent in 2006. In 2008, Morris Davis and Michael Palumbo were able to extend Davis and Heathcote's analysis to 46 large U.S. metropolitan areas over the 1984-2004 period.³⁷ They found that 43 of 46 metropolitan areas experienced a much faster appreciation of land prices than structure prices. Growth rates for land prices were substantially higher in cities along the coasts where the supply of residential land tends to be smaller. Cities with relatively low land shares in 1984 exhibited strong growth in land shares over the period, e.g., Detroit from 0.05 to 0.33 and Memphis from 0.14 to 0.31, while cities with relatively high land shares also continued to show substantial growth in land shares, e.g., Boston from 0.50 to 0.76 and San Francisco from 0.75 to 0.89 (Table 3).³⁸

What happened to land shares in Honolulu over the 1960-2014 period? It is notable that Honolulu's land share in 1960, 38 percent, was already an outlier compared to the national mean of 18 percent. By 1967 it had become an even bigger outlier—46 percent, more than twice the national average (19.9 percent) in 1970. My rough calculation of the share of land in Honolulu housing prices in 2004 ranges from 66 to 70 percent.³⁹ See Figure 9 for the share of land in the median Honolulu single-family home price over the 1970-2004 period. The Honolulu land share is far above the national land share average (51 percent) for major cities in 2004, slightly below the land share for cities in the western region (74 percent) but below the 2004 land shares for other high-priced West Coast metropolitan areas, including San Diego (81 percent), San Jose (82 percent), Oakland (78 percent), and Los Angeles (79 percent).

The high share of land value in Honolulu housing prices in 1960 (47 percent) and its fast track upward to 76-78 percent in 1990 is critical to understanding the evolution of Honolulu housing prices over the last five decades. This is because the dynamics of housing prices are very different in metropolitan areas where the value of housing is largely accounted for by the value of land (e.g., San Francisco, Boston, and Honolulu) compared to metropolitan areas where land's share of housing values is relatively small (e.g., Detroit and St. Louis).⁴⁰ The price of housing should be largely pinned down by construction costs in areas where land's share of housing prices is small and the

prices and data from the Bureau of Economic Analysis on the replacement cost of structures.

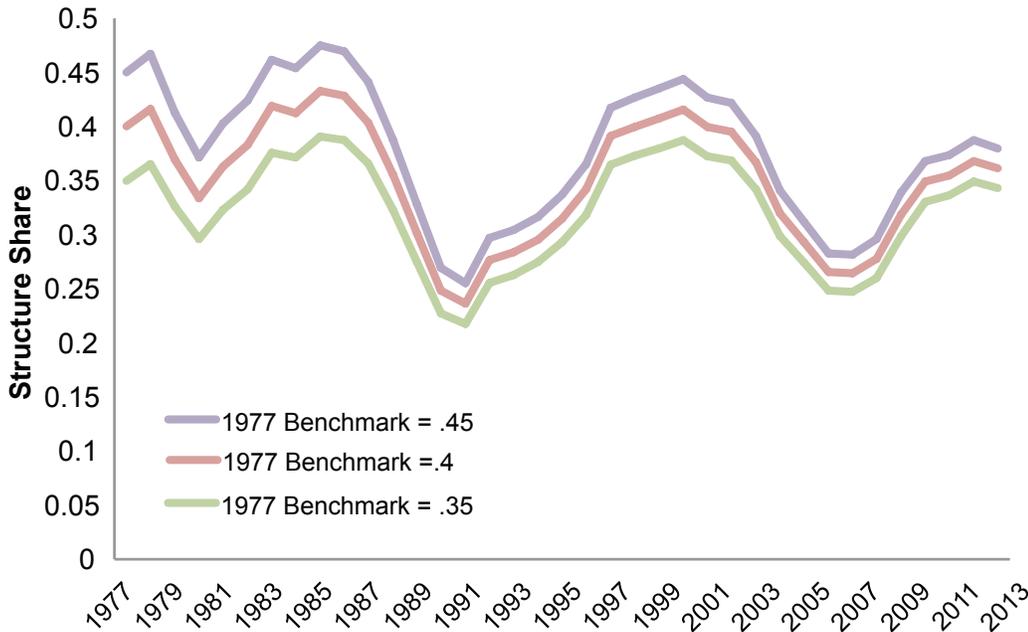
37 See Morris A. Davis and Michael G. Palumbo (2008). "The price of residential land in large US cities." *Journal of Urban Economics* 63(1): 352-384. Honolulu is not included in their sample of the 46 largest cities as it was the 56th largest U.S. metropolitan area by population in the 2000 U.S. census.

38 Land price appreciation over the last 15 years in coastal U.S. metropolitan areas was also accompanied by considerable volatility due to the mid- and late-2000s crisis in housing finance and the U.S. Great Recession of 2007-2009, the effects of which have lingered in many metropolitan area housing markets through the 2010s.

39 The calculation is rough because I use aggregate R.S. Means data on Honolulu construction costs rather than use disaggregated R.S. Means data

40 See Davis and Heathcote (2007), pp. 2610-2612 for an extended analysis of the factors influencing housing prices in metropolitan areas with high land shares.

Figure 9: Share of Structure in Hawaii Single Family Home Prices



FOR THE METHODOLOGY USED TO CALCULATE SHARE OF LAND IN HONOLULU HOUSING PRICE, SEE MORRIS A. DAVIS AND MICHAEL G. PALUMBO (2008). "THE PRICE OF RESIDENTIAL LAND IN LARGE US CITIES." JOURNAL OF URBAN ECONOMICS 63(1): 352-384. VALUES ARE DEFLATED USING THE HONOLULU CPI. THE SHARE CALCULATIONS USE AGGREGATE R.S. MEANS DATA ON HONOLULU CONSTRUCTION COSTS AND COULD BE IMPROVED BY USING DISAGGREGATED R.S. MEANS DATA TO TAKE INTO ACCOUNT CHANGES IN THE COMPOSITION OF STRUCTURES OVER TIME.

Table 3: Land shares in Selected US cities: 1984 and 2004

City	1984	2004
Detroit	5	33
Memphis	14	31
New York City	32	67
Boston	50	76
Oakland	61	78
Los Angeles	61	79
San Diego	66	81
San Francisco	75	89

SOURCE: DAVIS AND PALUMBO (2008).

share of the structure in the overall home price looms large. In these metropolitan areas, if demand factors push up housing prices, developers have incentives to build more housing and the extra supply pushes down the price of housing to the cost of constructing more housing. However, in metropolitan areas where land's share of housing is large, such as Honolulu, changes in factors affecting the demand for housing could be translated into big changes in housing prices. Factors affecting housing demand include the tax treatment of housing, nominal and real interest rates, and the metropolitan area's population and income growth rates.

Davis, Heathcote, and Palumbo's work on U.S. housing prices is critical to our understanding of Honolulu's high and increasing housing prices over the 1950-1990 period. The high share of land in Honolulu housing prices since the early 1960s points to changes in housing demand as the major drivers of housing prices in Honolulu. Two factors driving demand are likely to have been particularly important.⁴¹ First, there was a huge increase in Honolulu's population between 1950 and 1990, with non-military residents soaring from 353,000 in 1950 to 631,000 in 1970 to 836,000 in 1990. Second, average real per capita personal income in Honolulu also surged, rising from \$6,520 in 1950 to \$16,210 in 1990 (1984 dollars). The spectacular rise of Honolulu's tourism industry was behind both population and income gains in Honolulu, with population gains also fueled by migration from neighbor islands due to declining employment in the post-WWII period on sugar plantations in the neighbor islands.

Our understanding of housing prices in U.S. metropolitan areas and Honolulu has also been advanced by new studies examining how a metropolitan area's natural supply of land affects its land prices. Urban economist Albert Saiz refined the earlier Rose-La Croix measure of the natural supply of land by applying new data techniques to the problem that allow incorporation of much more detailed information about the landscape into the measure. His index calculates the developable area within 50-kilometer radii from a central city. Ocean, wetlands, lakes, rivers, other internal water and the area excluding the areas with slope above 15 percent are defined as undevelopable areas. Saiz finds that:

for all MSAs with population over 500,000 in the 2000 Census ... Ventura (CA) is the most constrained, with 80% of the area within a 50-km radius rendered undevelopable by the Pacific Ocean and mountains. Miami, Fort Lauderdale, New Orleans, San Francisco, Sarasota, Salt Lake City, West Palm Beach, San Diego, and San Jose complete the list of the top 10 most physically constrained major metropolitan areas in the United States. Many large cities in the South and Midwest (such as Atlanta, San Antonio, and Columbus) are largely unconstrained.

Since Honolulu is not included in Saiz's data set, I have calculated Honolulu's natural land supply using his methodology. See Figure 10 for a map of Honolulu with five-kilometer radii superimposed from the downtown business district out to a 50-kilometer boundary. Roughly 92 percent of the 50-kilometre radius circle centered on the Honolulu downtown is not developable. This is much higher than the 80 percent measure of undevelopable land for the next most constrained U.S. metropolitan area, Ventura, California. To provide some perspective on how much of an outlier Honolulu is among U.S.

41 The Hawaii State Legislature mentioned that increases in population were another factor pushing up the demand for land but failed to mention other important factors affecting land prices, in particular, widely held expectations of strong household income growth.

Table 4: Physical and Regulatory Constraints on MSA Land Development:
Selected Metro Areas with Population > 500,000

Rank	MSA Name	% Area Undevelopable	WRI
1	Ventura, CA	79.64	1.21
2	Miami, FL	76.63	0.94
3	Fort Lauderdale, FL	75.71	0.72
4	New Orleans, LA	74.89	-1.24
5	San Francisco, CA	73.14	0.72
10	San Diego, CA	63.41	0.46
11	Oakland, CA	61.67	0.62
12	Charleston-North Charleston, SC	60.45	-0.81
13	Norfolk-VA Beach-Newport News, VA-NC	59.77	0.12
14	Los Angeles-Long Beach, CA	52.47	0.49
15	Vallejo-Fairfield-Napa, CA	49.16	0.96
20	Tampa-St. Petersburg-Clearwater, FL	41.64	-0.22
21	Cleveland-Lorain-Elyria, OH	40.50	-0.16
22	New York, NY	40.42	0.65
23	Chicago, IL	40.01	0.02
24	Knoxville, TN	38.53	-0.37
25	Riverside-San Bernardino, CA	37.90	0.53
45	Tucson, AZ	23.07	1.52
46	Colorado Springs, CO	22.27	0.87
47	Baltimore, MD	21.87	1.60
48	Allentown-Bethlehem-Easton, PA	20.86	0.02
49	Minneapolis-St. Paul, MN-WI	19.23	0.38
50	Buffalo-Niagara Falls, NY	19.05	-0.23
60	Little Rock-North Little Rock, AR	13.71	-0.85
61	Fresno, CA	12.88	0.91
62	Greenville-Spartanburg-Anderson, SC	12.87	-0.94
63	Nashville, TN	12.83	-0.41
64	Louisville, KY-IN	12.69	-0.47
65	Memphis, TN-AR-MS	12.18	1.18
76	Houston, TX	8.40	-0.40
77	Raleigh-Durham-Chapel Hill, NC	8.11	0.64
78	Akron, OH	6.45	0.07
79	Tulsa, OK	6.29	-0.78
80	Kansas City, MO-KS	5.82	-0.79

Rank	MSA Name	% Area Undevelopable	WRI
90	Columbus, OH	2.50	0.26
91	Oklahoma City, OK	2.46	-0.37
92	Wichita, KS	1.66	-1.19
93	Indianapolis, IN	1.44	-0.74
94	Dayton-Springfield, OH	1.04	-0.50
95	McAllen-Edinburg-Mission, TX	0.93	-0.45

SOURCE: ALBERT SAIZ (2010), "THE GEOGRAPHIC DETERMINANTS OF HOUSING SUPPLY," QUARTERLY JOURNAL OF ECONOMICS 125(3) AUGUST: 1253-1296, AT 1258-59. "WRI" REFERS TO THE "WHARTON RESIDENTIAL LAND USE REGULATORY INDEX". "% AREA UNDEVELOPABLE" IS SAIZ'S MEASURE OF THE NATURAL SUPPLY OF LAND FOR AN MSA. "RANK" REFERS TO THE MSA'S RANK AMONG THE 100 LARGEST U.S. MSAS FOR THE NATURAL SUPPLY OF LAND.

Honolulu's high score stems from the multiple layers of rigorous, lengthy review by both state and county governments for all new development projects. Here's a quick summary of the obstacle course. A land development project requires the State Land Use Commission's (LUC) approval if the land needs to be reclassified from conservation, rural, or agricultural status to urban status and to determine compliance with state planning statutes. It requires county approval for zoning compliance, while counties are required to conform zoning decisions with county general plans. If the development is residential, the developer must file a subdivision plat, receive comments on the plat and obtain final approval for the plat. Development projects near the coast need to be in compliance with the county's implementation of the federal government's Coastal Zone Management Act. All development projects need to be in compliance with the federal government's Endangered Species Act. Finally, the developer must be in compliance with state rules requiring all development projects to obtain a review from the Hawaii State Department of Land and Natural Resources (DLNR) to determine whether the proposed site might be historic property or a burial site or contain aviation artifacts. If DLNR finds this to be the case, then the developer must commission an archaeological inventory survey and seek review and comment from DLNR's Historic Preservation Division. If human remains or cultural artifacts or aviation artifacts are located, then a plan must be developed and approved to make appropriate arrangements for their preservation, reburial, or relocation.

Albert Saiz used his newly developed measures of natural land supply and housing regulation to estimate whether they are associated with either the level or growth of US metropolitan area housing prices. His econometric analysis found that both variables had a statistically significant effect on median MSA house values in 2000 and growth in MSA housing values between 1970 and 2000. Saiz also controls for the "home voter" hypothesis, an idea first developed by the urban economist William Fischel in 2001.⁴⁴ The idea is that high housing prices induce homeowners to vote for city and county officials who support regulations on residential development. This feedback effect from high home prices

development regulation in the 1960s and 1970s via the State Land Use Law and the State's control of land development in the Kaka'ako district between downtown and Ala Moana Center.

44 See William Fischel, *The Homevoter Hypothesis*. Cambridge: Harvard University Press, 2001.

to even higher levels of regulation serves to maintain housing prices at elevated levels and protect home owners' wealth. Saiz's econometric results provide some support for the homevoter hypothesis in the overall U.S. sample.⁴⁵

How well does Saiz's analysis fit the case of Honolulu? For a parsimonious model emphasizing just three factors, it does a good job of explaining Honolulu's high ranking among U.S. cities in housing prices even if it fails to explain the full magnitude of the premium. Honolulu has the worst regulatory environment for new housing development in 2004 (when the survey for the Wharton Index was conducted) and the smallest natural supply of land among all U.S. metropolitan areas. And in 2015(Q1), it had the third highest housing price (\$699,000) among U.S. metropolitan areas.⁴⁶ These two variables and others in his regression explain about half of the premium in Honolulu's price.

The remainder of Honolulu's price premium could have roots in other positive attributes associated with living in Honolulu. Media and consulting firm surveys regularly place Honolulu among the top cities for quality of life.⁴⁷ Consider the following attributes which are likely to positively affect the Honolulu price: (1) *The warm water of the sub-tropic Pacific Ocean.* For people interested in ocean recreation activities, this is a huge advantage over such cold-water West Coast cities as San Diego, Los Angeles, San Francisco, and Seattle. (2) *The very high number of sunny days with very moderate temperatures and seasonal trade winds.* Honolulu has, arguably, the best climate in the world, with high temperatures at the Honolulu International Airport almost never exceeding 92/94° F in summer and low temperatures rarely below 60° F in winter. (3) *The multi-cultural and multi-ethnic social environment, highlighted by the host Native Hawaiian culture.* Racial and ethnic tensions are relatively low compared to many other U.S. urban areas, and the culture of the first people—native Hawaiians—is an important part of the lives of many non-native Hawaiian residents. (4) *Honolulu's low crime rate.* Murder, rape, and assault rates in Honolulu are lower than comparable rates for other U.S. metropolitan areas.⁴⁸

To gain access to these positive environmental attributes, Honolulu residents compete with each other and

45 Saiz also argues that the effects of regulation and natural land supply are more likely to operate when the MSA's population is sufficiently large. Otherwise the constraints on development are less likely to be binding, i.e., tightening regulation in an MSA with few amenities or productivity attributes is unlikely to have a big effect on housing prices, as the demand for new housing is unlikely to bump up against natural or regulatory constraints. For an application of the homevoter hypothesis to Honolulu's housing market, see A. Kam Napier, "Homeowners score \$55 billion windfall," *Pacific Business News*, November 13, 2015.

46 Monthly rental rates in Hawaii are also high, with a study based on U.S. Census Bureau data showing the monthly median housing rate to be (\$1,448) to be 55 percent higher than the national average. See Darian Moriki, "Tight supply drives rental rates up," *Pacific Business News*, September 25, 2015, p. 4.

47 Rankings tend to be higher when Honolulu consumers are surveyed as to their satisfaction with living in Hawaii. Rankings tend to be lower when tax rates and congested infrastructure, e.g., the ever crowded and slow H1 highway, are included in the rankings.

48 The presence of highly valued amenities in a metropolitan area can induce migration and population growth, which can, in turn, lead to congestion. Costs of congestion would offset to residents and visitors some of the value generated by the area's amenities. Think Honolulu traffic. See Antonio Ciccone and Robert Hall (1996). "Productivity and the Density of Economic Activity," *American Economic Review* 86(1): 54-70 for the classic statements of the tradeoffs between amenities, population density and productivity spillovers, and congestion.

with people living overseas to pay higher housing prices and to accept lower wages.⁴⁹ One might speculate that if Honolulu had the high wage rates of San Francisco and the low housing prices of Dallas, tens of millions of people would want to live in Hawaii, given its high degree of amenities. While the influence of the quality of life on a metropolitan area's housing prices and wages is a well-established proposition in the economics literature, direct evidence for Honolulu is relatively slim as it is usually omitted from empirical studies of U.S. metropolitan areas because of its unique "out-of-sample" characteristics. Nonetheless, it is well worth considering how two specific attributes of the Honolulu market channel competition to live in Honolulu's limited stock of housing. First, as we argued above, the natural supply of land in Honolulu is the smallest in the United States. More competition for land cannot lead to an expansion of the city beyond its limited shores. Instead, competition within the limited confines of a small island with two major mountain ranges pushes up the general level of housing prices and increases premiums for housing at the city center. Second, the tight regulation on both "green fields" development and redevelopment of already developed land leads to a smaller annual flow of net new housing. Over time, this leads to a smaller housing stock and higher prices.

The amenity-driven consumer demand for Honolulu homes, condos, and residential land stock does not happen in a vacuum. The residential, commercial, and industrial land markets in Hawaii are all linked, just as they are in the mainland United States markets (Figures 1-3). As residents compete for a limited stock of residential land and housing, this drives up land prices in commercial and industrial markets. A central point is that land markets in Honolulu cannot be understood in isolation. Understanding how the residential land and housing markets work is central to understanding how commercial and industrial land markets work.

Potential Policy Implications

What types of government policies might help to address high lease rents for industrial properties? State and county policies designed to stabilize the Hawaii economy could help, as a less volatile Hawaii economy would likely be accompanied by a less volatile Honolulu land market. Such policy measures are much easier to suggest than accomplish, because most shocks that affect the Hawaii business cycle are not generated in Hawaii but rather are

49 For the classic analysis of the influence of metropolitan area amenities on area housing prices and wages, see Jennifer Roback (1982), "Wages, Rents, and the Quality of Life," *Journal of Political Economy* 90(6) December: 1257-78. Blomquist and coauthors use estimated value of amenities to calculate quality of life indexes by metropolitan areas. See Glenn C. Blomquist,

Mark C. Berger, and John P. Hoehn (1988). "New Estimates of Quality of Life in Urban Areas." *American Economic Review* 78: 89-107. David Albouy applies modern econometric techniques to the estimation problem. See David Albouy (2008), "Are Big Cities Bad Places to Live: Estimating Quality of Life across Metropolitan Areas." National Bureau of Economic Research Working Paper No. 14472, Cambridge, MA. For a survey of the policy implications of this literature, see Nicolai See Kuminoff, V. Kerry Smith, and Christopher Timmins (2013). "The New Economics of Equilibrium Sorting and Policy Evaluation Using Housing Markets." *Journal of Economic Literature* 51(4): 1007-1062. Gabriel and Rosenthal (2004) suggested that amenities that attract business firms are often quite different from those that attract residents. Metropolitan areas with many attributes valued by consumers and few attributes valued by firms could generate both higher housing values and lower wage rates than other cities.

external shocks, transmitted to Hawaii by changes in U.S. output and inflation, federal government spending on the U.S. military, and incomes and exchange rates of international economies sending tourists to Hawaii. Consider the multiple sources of downturns in Hawaii's economy over the last 25 years. Hawaii's lost decade of the 1990s was primarily due to declines in tourism due to the first Gulf War (1990/1991), Hurricane Iniki, the early-mid 1990s recession in California, and the decade-long recession in Japan; the closure and downsizing of U.S. military bases in Hawaii and California (a consequence of the winding down of the cold war with the Soviet Union); declines in Japanese foreign investment in Hawaii; and the slow U.S. economy of the early-mid 1990s. The downturn of the late 2000s coincided with the global Great Recession, an event that depressed both U.S. and international demand for Hawaii vacations. State policymakers have few policy mechanisms to use to offset large international and national shocks transmitted to Hawaii. State fiscal policy is difficult to use on a large enough scale due to balanced budget requirements imposed by the State's constitution. Additional publicly- and privately-sponsored tourism advertising can help to smooth but not eliminate shocks to tourism numbers when there is an international or national recession. One example of a stabilizing policy that state government can use to offset outside shocks is counter-cyclical state construction spending. Such policies are, however, difficult to time correctly—as shown by the State of Hawaii's lack of significant boosts in construction spending during the Great Recession and subsequent recovery—and are typically small in magnitude relative to the shocks they are designed to offset. It is easy to identify episodes in which Hawaii policy makers could have better regulatory and fiscal choices to cushion the impact of the negative shocks and invest surpluses from positive shocks but in the grand scheme of things, such measures will always be small relative to the shocks they are intended to offset.

Hawaii's situation differs little from other global economies that are small, open to international trade and investment, and relatively undiversified. As noted above, two recent cross-country studies suggest that small open economies that are less diversified in their economic activities are more vulnerable to economic shocks than those that are more diversified. State policies designed either to promote new industries or to strengthen the slow-performing Hawaii economy might have the desired effects of smoothing volatile land and housing markets. They are, however, also likely to contribute to even higher levels of lease rents. This is because economic diversification supported by solid economic policies could also increase trend economic growth in Hawaii. Higher economic growth means higher incomes, and consumers would then bid up the prices of homes, condos, and land, non-traded goods that in Honolulu are in fixed supply for the medium run due to the small amount of developable land and severe regulatory policies in place.

Some have advocated passage of land reform measures that would allow lessees to purchase their leased lands. Underlying these proposals is the idea that large land owners with market power would gain new incentives to develop additional lands after divestment, as development would no longer reduce returns on a large stock of landholdings. In central areas, such as Mapunapuna, there is little unused land to be released to the market for development if the area's large landowner were to be forced to sell industrial land holdings. And without an increase in the supply of land to the industrial market, there is no reason to believe that lease rents on industrial and commercial land would fall.

Three plausible but not necessarily politically feasible policy options remain. One option is for the State of Hawaii to examine its landholdings near industrial areas and to determine whether additional state lands could be dedicated to industrial use. Some market observers have blamed the recent run-up in industrial rents on the State's removal of some industrial property from the market while it revamps port facilities at several locations near Honolulu Harbor. Less supply very near the central business district could affect rents substantially, as vacancy rates for the relatively small supply of industrial lands within a few miles were very low in 2014/2015.⁵⁰

A second policy option to counter high rental rates in the industrial land market is to zone more land for industrial use in or very near the central business district-Waikiki-Aiea areas. That's easier said than done due to the intensity of land use in the central Honolulu urban corridor stretching from Waipahu to Kahala. Nonetheless, as areas in Honolulu redevelop, it could make sense to identify particular tracts of land for which zoning and general plan designations could be gradually changed to industrial use. While such changes would not be popular with area residents, they have potential to reduce leasehold rents and even to open up more industrial lots for sale to firms in these industries.

A third policy option is for the City and County of Honolulu to allow denser development on industrially zoned land. One way to accommodate this would be for the City to review its rules on development of industrial-zoned lands and to revise them to lower the regulatory burden of development. Paradoxically, allowing less costly and more development of these lands could raise their value and led to increased lease rents. Still, the cost of land per unit of capital utilized on the land would likely decline, benefiting both lessees and consumers.

Whether any of these policy options are feasible is difficult to determine. All come with significant costs—more industrial development near neighborhoods, more dense development, or more government lands dedicated to industrial users. Whether or not policymakers would be willing to use them surely depends on whether the island's population is willing to bear the tradeoffs that would come with these policies.

50 See, for example, Duane Shimogawa, "Warehouse shortage bad news for tenants," *Pacific Business News*, January 30, 2015, p. 3; Duane Shimogawa, "Oahu warehouse market gets tighter," *Pacific Business News*, July 24, 2015, p. 8; "Little space to expand and high rates put industrial businesses in a tight spot," *Pacific Business News*, August 14, 2015, pp. 10-13.

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