Real Estate and Business Cycles

Henry George's Theory of the Trade Cycle

by

Fred E. Foldvary

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Introduction

The influence of real estate on trade or business cycles has been subjected to some analysis, yet it has not been given a significant role in macroeconomic theory. Theories of business cycles seldom take the real estate market into account (Hansen, 1964, p. 39); Henry George's theory that land speculation is a key initiator of business cycles has not been refuted, but neglected and ignored. Yet, as Peter Hammond (1984, p. 61) states, "The modern view is that we have no acceptable economic theory of the basic cause of business cycles." Generally, they are ascribed to exogenous shocks, e.g.: "The National Bureau of Economic Research RPI (recession probability index) model follows the traditional assumption that expansions and contractions are part of the same stable structure, and are responses to random shocks (policy and other)" (Huh, 1991, p. 1). The NBER model failed to detect the onset of the current recession (p. 3).

In George's theory, the shocks are endogenous and therefore may help provide a key theoretical link in cycle theory. Moreover, the theory, indicating that real estate indicators lead recessions would successfully have predicted the current recession and the major depressions of the past.

This paper examines the theory first proposed by Henry George in 1879 that real estate, especially land speculation, has a significant causal effect on business cycles. The results of this study are that the proposition that real estate plays a significant role in business cycles is consistent with modern economic analysis and empirical cycle data. However, a real-estate-induced theory of business cycles requires the inclusion of the construction industry, and it is incomplete without taking into account complementary monetary forces and the role of public works.

This study also concludes that the effects of real estate have not

been a pure market activity, but have been influenced by significant government fiscal and monetary interventions. Taking these factors into account, this paper also proposes a revision of the classical macroeconomic model to include land speculation and government intervention. The revised model would counter the conventional view that the classical model fails to account for depressions and unemployment, and the corollary that the classical free market failed to prevent depressions. In the revised model, speculation induced by interventions cause these macroeconomic maladies.

The "real estate" market and industry will be considered here to include both land and improvements, their selling and rental prices, the economic rent of land and returns on buildings and other improvements, and the construction industry.

The theory in this paper has the following premises: 1) real estate is a significant component of national wealth and national product; 2) real estate has been subject to wide fluctuations in price; 3) these fluctuations, facilitated by the money and credit markets, are in large measure induced by government expenditures and policies; 4) real estate speculative booms can raise the costs of business and construction booms are a major portion of investment; 5) historically, real estate values and construction have peaked shortly before major depressions. The analysis concludes that real estate is capable of playing a significant role in major business cycles. The evidence is consistent with Henry George's theory that land speculation is a major causal factor in business cycles, but George's theory is imcomplete unless the construction industry, complementary monetary institutions, and government policy are included.

The Georgist Theory of Business Cycles

Henry George acknowledged that factors other than land, such as "the tremendous alterations in the volume that occur in the simpler forms of

commercial credit," affected business cycles. However, in his theory, land plays the primary role. George maintained that "speculative advances in land values" check production and are the initiatory cause of periodic depressions (George, 1975, p. 263).

The elements of the Georgist theory are: 1) Land is essential for all production. 2) In any particular economic region, the supply of land is inelastic; it has a fixed supply. 3) When a boom is underway, the anticipated increase in land values induces speculators to buy it for price appreciation rather than for present use, which causes its current value to rise above that warranted by present use. 4). Once wide-spread speculation sets in, land values are carried beyond the point at which enterprises can make a profit after paying for rent or mortgages. Production slows down, reducing aggregate demand. The slowdown ripples through the economy, increasing unemployment and bringing forth a depression.

After land prices and rents drop, the normal rent and land prices are restored, increasing the profitability of enterprise. The economy recovers. George noted that depressions were preceded by seasons of activity and land speculation, "followed by symptoms of checked production" (p. 268). "The diminution of the effective demand of consumers is therefore but a result of the diminution of production" (p. 269). Some obstacle is checking production, and the major check is the high cost of land and rent, in effect "a lockout of labor and capital by landowners" (p. 270). Speculative land costs in effect demand a part of future output in the present. George's theory attempted to resolve the paradox of idle labor and capital in the depths of a depression. The reason the market was not clearing was that labor and capital were cut off from the necessary natural opportunities offered by land as both space and physical resourses.

Writing after the depression of the 1870s, George pointed to the

example of the railroads, the construction of which had been accompanied by widespread speculation that "ran up land values in every direction... Lots on the outskirts of San Francisco rose hundreds and thousands per cent, and farming land was taken up and held for high prices" (p. 276). As the transcontinental railroad approached completion, instead of bringing prosperity, a depression began. The rapid construction of railroads itself was a result of land grants by the federal government to spur on a national rail network. The train of events that contributed to the depression of the 1870s was therefore not a purely endogenous market process but induced to a great extent by the shock of infrastructure subsidies by government, capitalized into land values which then increased via speculation to heights which choked off enterprise.

Theorists of real-estate cycles after George have emphasized the building industry rather than land speculation per se. For example, George Hull (1911, p. 130) wrote that the high price of construction is the "real, original, and underlying cause" of industrial depression.* Karl Pribam (1940), an Austrian who moved to the U.S. in 1931, integrated land values, construction, and the role of credit. Fred Harrison (1983, p. 65) proposes the hypothesis that the construction industry is a "transmission mechanism" by which the land market impacts "the factory, office and corner retail store." A key aspect of this mechanism is the tendency to overbuild during a boom, followed by a long interval of depressed building. Construction and development are themselves induced by land speculation. An example of transmission was an important furniture firm in Washington, DC, which filed for bankruptcy under Chapter 11 on October, 1990, as a result of the real estate slump, closing stores and laying off employees (Swisher, 1990).

The Nature and Dynamics of Real Estate

Subsequent to George, other theorists have written on the nature and

dynamics of real estate, which further elucidate its relationship with business cycles. The first premise of George's theory, that land is important in production, is confirmed empirically. Data published by the Federal Reserve (1991, p. 6) put U.S. land at $3.7 trillion, 23% of domestic net worth. This is most likely an underestimate; a calculation by Steven Cord (1990) puts real property in the U.S. in 1986 at $10.8 trillion, not far from the figure calculated by the Bureau of Economic Analysis for 1988 at $10 trillion (Miles, 1990, p. 73). Mason Gaffney (1970, p. 181) estimates land at at least half the value of real estate. Homer Hoyt (1933, p. 233) cites data from the U.S. Census stating that real estate made up over half of the total wealth in the U.S. in 1922.

Real estate in other countries exhibits similar orders of magnitude. In Japan the total land value has been computed as twice that of the United States (Mahar, 1987, p. 22), and the percentage of national income made up by land rent in Great Britain was estimated in 1989 to be 29% (Banks, 1989, p. 40).

Historically, land values have been subject to large fluctuations. In Chicago, total land value in current dollars was $160,000 in 1833, $10 million in 1836, $1.2 million in 1842, $125 million in 1856, $60 million in 1861, $575 million in 1873, $250 million in 1877, $1.5 billion in 1893, $5 billion in 1926, and $2.5 billion in 1932 (Hoyt, 1933, p. 254). As Hoyt observes (p. 233), such fluctuations in so important a type of property cannot fail to affect the entire economy.

The construction industry, an important element of the real estate story, has amounted to a quarter or more of total investment (Matthews, 1967, p. 98), and it affects the demand for other durables and employment. For example, in 1929, total direct employment in construction was 3 million, but 9 million were employed if complementary industries are

included (Long, 1940, p. 7). Arthur Burns (1969, p. 69) states that "few other industries have the power to convert an increase in activity into a sustained expansion."

Anticipation is a crucial factor in the real estate cycle. Homer Hoyt (1933, p. 233) remarked that "Wealth in the form of land or buildings which seemingly rests on so secure a physical foundation in fact depends on the ability of landlords to maintain gross rents above operating costs for long periods in the future". During the 1970s, "speculative activity stimulated purchases by owner-occupants because it reinforced the latter's inflationary price expectations" (Grebler & Mittelbach, 1979, p. 65). When land values are rising, real estate is capitalized on the assumption that values will continue to rise. Bank loans, rental contracts, and other commitments are made on this basis, "until the whole financial structure of society is involved in the support of the newly created land values." The situation is spurred by "the pressure of funds seeking investment," sustained by values that seem much safer than they really are (Hoyt, 1933, p. 233).

Arthur Burns (1935, p. 94) argues that pecuniary forces induce correlation in construction cycles among various regions. Uncertainty regarding future rents and demand, along with as well as the durability of buildings, prolongs the cycle (p. 94-5). When a minor recession occurs during a building boom, many projects in progress continue and reduce the potential severity of the recession. By the same token, overbuilding cannot be corrected quickly.

The typical pattern of the real estate cycle is as follows. There is population growth and industrial development, facilitated by public works and other government services. This creates an increase in the aggregate demand for housing and other buildings, exceeding supply.

Time is required for the supply, building construction, to catch up. Construction, requiring land, adds promptly to the demand for land (Burns, 1969, p. 68). Following a rise in building activity, rents and land values rise (Pribam, 1940, p. 70), and then the rate of increase rises as a rising net income from real estate induces an increase in real estate prices. Credit is attracted to construction and sales. Absorption of vacant land for new buildings starts a boom in vacant land and the subdivision of vacant land into lots for speculative resale. Many lots are laid out by real estate companies solely for the purpose of selling to "investors" to resell at a profit without having to build on them. From 1920 to 1929, 279,000 lots were subdivided in Chicago's Cook County mostly sold to speculators. From 1930 to 1950 there was almost no subdivision of lots for resale; the subdivision was done for actual building (Hoyt, 1970, p. 153).

The peak of the real estate cycle is characterized by a high volume of real estate transfers (Hoyt, 1933, p. 396) and the high tide of speculation by subdivision. By that time, the supply of new houses outstrips the number of new residents or occupants. Karl Pribam (1940, p. 65) points out that in the latter stages of a boom, rentals fail to adjust themselves to costs, rendering building activity unprofitable. Since land prices are slow to move downward, they contribute to the break of the building boom. William Newman (1935, p. 18), echoing George, wrote that "Excessive land values, reached after the boom has continued for some time, are eventually found to have no counterpart in increased earnings, and therefore contribute to the break of the building boom." Rising interest rates also contribute to the slowdown of the boom. According to Newman (1935, p. 29), the correlation is not between building activity and bond yields, but between directions of movements. Burns (1969, p. 32) adds that contracts for residential construction typically turn down before commitments for any

other major category of investment.

The procurement of land for development peaks after residential building has peaked (Gottlieb, 1976, p. 24). Gottlieb (p. 185) states that urban land values have an elasticity of response and a cumulative momentum unique to major input factors. The prices of vacant land have a cyclical amplitude twice that of used residential lots (p. 153). Amplitudes are greater in construction contracts than in construction volume (Burns, 1969, p. 23). Slow to start, land values gain momentum and then persist after a reversal in business. The amplitude of the oscillations of building activity far exceeds those of general business activity.

Soon after its peak, the real estate market enters a slow phase. It is observed that prices are no longer rapidly advancing. Nominal asking prices stay high, but there are now few buyers. Vacancies rise. Building declines. The sale of bare land drops rapidly and prices level off. In many instances, a financial panic or crash shatters real estate optimism, though it does not cause an immediate real estate price crash. The commercial crisis or business depression ushers in unemployment.

A subsequent slackening of industry wears down land values. When the decline begins, it is longer than stock market crashes due to a) the lack of short selling, b) the tenacity to which owners cling to mortgaged property, and c) the slow process of foreclosure (Hoyt, 1933, p. 407). During the downswing, the net income of real estate falls due to falling rents and increased vacancies, while mortgages and other operating costs remain rigid in the short term. Therefore there are widespread defaults on mortgages and other loans. The foreclosure rate increases. Unemployment and lower real wages further reduces demand for real estate. Population growth slows. Many residents "double up." To secure occupants, rents decrease. Many banks fail, having loaned large amounts to illiquid and

fallen real estate.

The low point of the cycle is characterized by high vacancies, low building rates, forclosures, and an absence of speculation.

After the old obligations such as mortgages and contracts are gone and the wreakage of the collapse is cleared away, shrewd investors pick up real estate bargains. A rise in business renews the cycle.

Catastrophe theory may aid in understanding the dynamics of the real estate cycle. The analysis of Frederic Jones (1991) indicates that it involves a "hysteresis" or delayed-action phase, in which funds flow into a non-productive vortex of land speculation, followed by the catastrophe of the crash.

In the Austrian theory of cycles, an increase in the money supply induces investment in capital goods and later results in price increases. One would then expect a corrolation between money supply, such as M1, and later median prices of housing. During the 1980s, new home prices increased faster than inflation. In part, this was a real increase due to a shift towards larger houses with more amenities (Future, 1991, p. 7). However, part was quite likely due to a speculative increase in land values. If speculation requires accomodation by the banking system, then there should be a strong correlation between the money supply (adjusted for population) and housing prices. A regression test of housing prices (adjusted for inflation) from 1981 to 1988 as a function of per-capita money supply (M1) three years earlier yields an adjusted R square of .88 (88% of house prices explained by M1) and a high t ratio (statistical significance) for M1 of 7.33, providing strong statistical evidence of the link. (Regressions for same-year and one- and two-year lags result in lower R and t values as the lag is decreased.)

Testing a null hypothesis that the money supply has no relationship to

construction activity, a regression for 1978-88 of per-capita money supply as a function of inflation-adjusted construction in the same year rejects the hypothesis, with a statistically significant t ratio of 2.4 and adjusted R square of .82, consistent with the theory that the money supply is accomodating the building boom (1). The data for the current recession (1990-91) are consistent with the theory that the construction boom is accomodated by the money and banking system and that the increase in money is an important element in the speculative rise in land values.

Analysis of George's Theory

George's theory of business cycles can be analyzed by examining a general theory of cycles. The first question is whether macroeconomic fluctuations are cyclical to begin with. As Alvin Hansen (1964, p. 6) states, an analysis of cycles and the data support the theory that the significant changes in macroeconomic variables are cycles rather than mere fluctuations. A phase of a cycle is related to preceding phases.

The theoretical conclusion that fluctuations are inded cyclical implies that there are general theoretical propositions which can be made about cycles. Gottfried Harberler (1960, p. 276) writes that a "very general theory of the most important aspects of the cycle can be evolved." A general theory of cycles would focus on generic causes rather than specific ones; as Harberler states, such a complex phenomenon does not lend itself to an explanation by just one factor (p. 5), and Schumpeter (1939, p. 161) stated that there are many reasons to expect wavelike fluctuations. The key puzzle in cycle theory is the cause of the decline, rather than the upswing, since the agents in a market economy naturally wish to better their condition. Indeed, a puzzle exists when the economy <u>fails</u> to recover.

From the viewpoint of an individual enterprise, it would wish to continue operating so long as it expects to make a profit. The forces which can reduce profits are: 1) a downward shift in the demand curve for the firm's products, reducing revenues; 2) an upward shift in the supply curve of its inputs, raising costs; 3) a change in the production function which increases costs.

A gradual increase in costs or reduction of revenues can be adjusted for so that, overall, firms can raise prices or reduce volume while maintaining normal profits. Some firms may exit, but the rest will continue normally. Wages can gradually be reduced as the demand for labor slowly shifts downward. However, a sudden input-supply or output-demand shock will not be readily accomodated if the demand for the final product is elastic. Profits could then diminish to the point that the firm goes out of business. Hence, the generic theory is based upon the fact that market responses to such shocks take time (cf. Garrison, 1984), in part due to uncertainty, and a major disequilibrium can cause a rapid loss of profits, leading to business declines, unemployment, and a depression before the market can adjust to them. As noted by Friedrich Hayek (1941, p. 408), money is a "loose joint" which does not accomodate an immediate coordination of price changes.

Specific theories of cycles must therefore focus on particular reasons why there have been or must be significant and rapid changes in costs or demand. Usually, theory has pointed either at a reduction in demand after a non-self-sustaining increase, or else an increase in costs. Examples of economy-wide costs which could rise to choke off profits include labor, interest rates, raw materials such as oil, natural occurances such as droughts, and taxation. George's theory points to land and rent costs. One can see why there are so many different cycle theories: each points to

different costs or different explanations of why costs would rise.

Once costs cause firms to fail, there would be a reduced demand both for intermediate goods and employment, and subsequently a reduced demand for consumer goods. Hence, the second part of the generic theory would come into effect: reduced revenues for firms, accelerating the decline.

The generic cycle theory also includes an analysis of the key turning points. Burns and Mitchel (1946) regard the peaks and troughs as the critical points, whereas Joseph Schumpeter (1939) positted the critical region as the points of inflection, where the upward swing switches from acceleration to deceleration and vice-versa for the downward swing (Hansen, 1964, pp. 7-8). A generic theory of cycles would seem to favor the Schumpeter view; the peak and trough are visible and dramatic, but the causal change seems to occur at the inflection. If these are smooth curves, the first derivative would measure the increase or decrease at a point, while the second derivative would measure the rate at which the increase or decrease is changing. At the point of inflection, the second derivative changes sign: an upswing which was speeding up now slows down. As Hansen (1964, p. 180) notes, during an upswing, the peak of net investment is reached at the point of inflection.

A negative second derivative continuously slows down a boom as it climbs to a peak. Hence, the seeds of the depression are laid in the middle of the boom when the second derivative turns negative. This accords with the generic theory of one cause of the downturn as an increase in costs, which would occur during the boom, reducing profits until the boom comes to a halt. Henry George (1975, p. 264) recognized this second-derivative principle when he wrote that during an upswing there is "a failure in production to increase proportionately..."

The term, "the" business cycle, presumes that there is one type of

cle, but in a general theory of cycles, this cannot be assumed. Hansen (1964) has identified three types of cycles. (Schumpeter (1939) also posited three types, though different from Hansen's.) There is a minor inventory cycle of an average duration of about four years, intermediate cycles (which Hansen calls "major") in producers' equipment of various duration, and major real-estate cycles which in the United States averaged about eighteen years in duration up to 1929. There may also be "long-wave" "Kondratieff" cycles of 50-60 years or more. Each of these cycle types would have its own dynamics and causes.

The theory proposed by Henry George might therefore only account for one type of cycle rather than be a universal explantion for all cycles. Furthermore, George's theory provides a plausible case for land costs as one cause of the downswing of a cycle, but it does not preclude the possibility of the other causes. It is possible, in general, for several causes to combine to turn the second derivative negative.

Because of the theoretical possibility for several types of cycles and several types of economy-wide costs, any specific theory must be tested against the historical record to determine empirically whether particular costs in particular cycles did indeed cause the downturns. The case for George's theory must therefore rest on empirical as well as a priori grounds.

Real Estate Cycle History

A distinctive feature of fluctuations of both construction and real estate prices over the last 100 years in the U.S., Great Britain, and other countries is their regularity in long cycles of roughly 20 years (Matthews, 1959, p. 98). Clarence Long (1940, p. 155) observed that a decline in building precedes general business declines in major downturns, and also that the long building cycles have different durations in different

countries (p. 159).

Great Britain's real estate cycles started as early as the close of the 1700s, when land values rose. Between 1842 and 1914, in 22 of the 26 peaks and troughs of the business cycle, house building preceded or coincided with the turning points in business (Harrison, 1983, p. 73).

Karl Pribam (1940, p. 65) reports that pre-World-War-I construction in Great Britain and Germany anticipated business contraction or expansion by one to three years.

The United States has had a real estate cycle of roughly 18-year spans, starting as early as 1800. The peaks of the U.S. real estate cycles from 1800 to 1960 occurred in 1818, 1836, 1854, 1872, 1890, 1907, and 1925. Cycle bottoms occurred in 1819, 1843, 1858, 1875, 1894, 1908, and 1933 (Hoyt, 1970, p. 537). Upward movement in real estate prices persisted in 1819-1836, 1860-72, 1894-1907, 1908-1925. Sharply falling real estate prices occured in 1818-19, 1837-1840, 1857-59, 1873-75, 1892-94, 1907-08, and 1929-32 (p. 538). Detailed histories of these cycles are related in Hoyt (1933), Sakolski (1932), Hicks (1961), English and Cardiff (1979), and other works, including, of course, many studies of the Great Depression. A few highlights of this history will be related here to document the consistency of the historical record with George's theory.

The Chicago real estate market is the most thoroughly studied of any American city, due to the work of Homer Hoyt, who stated that Chicago's real estate cycle is typical of U.S. real estate trends (1970, p. 538). The real estate cycles of Chicago, reported in detail by Hoyt (1933), shed light on the forces behind real estate price movements. The boom and bust of the 1830s will be outlined here in detail, as it reveals the basic elements of George's theory.

The success of the Erie Canal in New York State and the rapid rise of land values along its route led to the extension of the same speculative calculations to Chicago when a canal linking Lake Michigan (and New York via the Erie Canal) to the Mississippi River was proposed. In 1833, the federal government appropriated $25,000 to dredge the harbor. The local Black Hawk Indians were subdued by federal troops in 1832, sparking a rush of settlers to Chicago (Hoyt, 1933, p. 19). Note here the presence of three governmental interventions or works: canals, harbors, and the removal of the Indians, at no direct expense to the potential landowners. In 1833, the Pottawatomie Indians sold 20 million acres near Chicago to the U.S. for 6c per acre. Land speculation began that year with a sharp rise in the value of the business center. Demand for lots in actual use started a speculative movement. Reports of real estate fortunes in Chicago reached the East, and Chicago lots were sold at public auctions in Manhattan.

In 1835, there was already nationwide speculation in commodities and real estate. Though real estate values had been rising steadily through the early years of the decade, suddenly the price of land began to skyrocket, beginning in the eastern cities and spreading westward and to rural areas (English and Cardiff, 1979, p. 13). "There was a rampant rage for all sorts of landed property in all parts of the country" (Sakolski, 1932, p. 238).

The speculative mania was fed by a "superabundance of paper money issued under diverse state laws" (Hoyt, 1933, p. 28). Government lands could be purchased with irredemable "rag money" created by the state-controlled "wildcat" banks (Sakolski, 1932, p. 234). The newly chartered State Bank of Illinois was empowered to loan funds for real estate. A branch of the bank was established in Chicago in December 1835. "One of the most potent devices for raising land values, liberal credit to land

buyers, was thereby created" (p. 27). Here we see the money and banking system, again under the influence of government, fueling land speculation.

The rise in land values continued into the summer of 1836. The peak occurred in Chicago at the very same time time that work finally began on the canal. A slow advance was maintained until the end of the year, with much fewer sales as speculators sought to maintain values at the high plateau. Meanwhile, the volume of currency issued by the banks to sustain the balooning land values was greater than could be redeemed in specie. President Jackson on July 11, 1836, issued a "Specie Circular" ordering that land office accept only specie. Speculation ceased, but the damage had been done. Land prices had nowhere to go but down. In May 1837, the banks of New York suspended specie payments and there was a tightening of the money market. On May 29, 1837, the Illinois banks suspended specie payments, backed by a special act of the legislature. It became impossible to borrow money on real estate or to renew existing loans.

The Panic of 1837 became a national depression. The prices of goods fell. Real estate prices collapsed. Debtors defaulted. Chicago land purchased for $11,000 an acre in 1836 sold for less than $100 in 1840. Land that had been staked out and held during the speculation of the 1830s was converted into cultivation during the 1840s when no further immediate gains were anticipated (p. 40). The bottom of the real estate market occured in 1842. The State Bank of Illinois failed also in 1842.

The next real estate cycle was underway as the long-awaited Chicago canal opened in 1848. The Illinois Central Railroad secured a land grant of 2.5 million acres from Congress in 1850. The city constructed plank roads, sidewalks, gas lights, sewers, and bridges. "Plank roads contributed greatly to the rise of land values" (Hoyt, 1933, p. 64). The ease of borrowing money from the new state banks again encouraged real

estate speculation. There was also a rapid rise in land values in San Francisco; "speculation carried it beyond prudent heights" (Sakolski, 1932, p. 258). In the summer of 1857, a financial panic began, starting in New York. (Land values had collapsed earlier in California.) Overspeculation in western lands and too-rapid railroad building were blamed. Banks suspended specie payments. A depression followed in 1858. Most holders of real estate hung firmly to the peak prices of 1856, but by 1859, land values had dropped sharply to half or more than the previous levels.

After the Civil War, "Chicago shared the zeal for public improvements with many American cities". These included sewers, street paving, lamp posts, and bridges. "Lavish expenditures for improvements, and some political corruption, were blended in the land boom that culminated in 1873" (Hoyt, 1933, p. 88). Post Civil-War land values gained impetus near the parks and boulevards. One contemporary writer noted that "the city acceded to the demand of every real estate speculator who asked for improvements" (p. 117). The value of real estate was often raised on the strength of projected improvements. By 1873, business profits were receding. Wages declined. Land values halted in their advance. The stock market crashed, and commercial failures brought on the Panic of 1873.

Homer Hoyt remarked that the real estate cycle in Chicago from 1918 to 1933 was "as perfect a cycle as the cycle theorist could ask for" (1970, p. 527). During this time there occurred a remarkable reversal in the relative position of urban and rural real estate. The prices of American farm products had more than doubled from 1914 to 1918. The value of American farm land doubled from 1900 to 1910 and doubled again from 1910 to 1920, reaching $55 billion (Hoyt, 1933, p. 234; cf. Hicks, 1961, p. 70).

In 1920, the total value of U.S. urban land in cities of over 30,000 was $25 billion. By 1926, farm land had dropped to $37 billion and urban

sites rose to over $50 billion (ibid.). With food exports reduced after the war, there was a sharp decline in commodity prices after 1920. An agricultural depression began in 1921. As farmland values declined, rural banks failed.

In March 1926, the New York stock market took its worse dive since 1920. During 1925, $500 million of northern capital had poured into Florida real estate, where speculation was most extreme (Thomas, 1977, p. 208). In the fall of 1926, the Florida land boom collapsed, dampening speculative activity in other areas.

But construction in the cities continued with undiminished ardor in 1927-1928. From 1923 to 1929, the square feet of office space in Chicago almost doubled. So powerful was the 1920s boom and subsequent bust that no new office buildings were erected and no new large hotel was built from 1931 to 1950 (Hoyt, 1970, p. 153).

Land values continued rising in some areas, though the market had slowed down. In the typical pattern, while nominal prices stayed high, "it was becoming more and more difficult to sell for cash" (Hoyt, 1933, p. 258). Prices, rents, and construction peaked during 1925-1926 in many American cities.

If construction was the key ingredient behind the "second derivative" of the 1920s boom, its decline after 1925 would eventually bring the first-derivative growth to a halt. The timing, in the midst of the boom, would be right. Hansen (1964, p. 46) calls the drop in construction in 1928 "catastrophic," and states, "No explanation of the boom of the twenties or the severity and duration of the depression of the thirties is adequate which leaves sout of account the great expansion and contraction in building activity." Hoyt (1970, p. 532) remarked that the increase in the number of foreclosures in 1927 "was a barometer of approaching financial

storms".

Murray Rothbard (1975, p. 86) reports that the money supply of the U.S. increased by 62 percent during the 1920s boom. The major increases took place in 1922-25. Most of the expansion consisted of loans, i.e. credit expansion. Here again, the money and credit system, this time orchestrated by the new Federal Reserve System, had fueled the speculation.

The depression in Germany was also preceded by a building boom, beginning in 1924 after the re-establishment of the gold value of the mark. Land prices rose 700% in Berlin and 500% in Hamburg within six years . It paid "to be on good terms with members of the City Council" for timely information on a new underground line and other works (Heilig, n.d., p. 7). Taxpayers were also made subsidies to house builders. After seven years of boom, the cost of living was high, especially for housing, and workers pressed for higher wages. Businesses tried to substitute capital for expensive labor. By 1930, "the first signs of crisis became manifest. Amortization, rents, interest, taxes ate up everything" (p. 23). Industrialists could not meet debts. Rising unemployment contributed to the influence of the Nazi party, which made lavish promises.

The next historical real estate peak in the U.S. would have occurred in 1943 had the 18-year cycle continued, but building was dampened by war measures. Price and rent controls, millions of men overseas and a postponement of marriages reduced the normal real estate demand. The historical U.S. real estate cycle was broken, and, interestingly, there was the absence of a 1940s boom as well as of a serious post-war depression.

Indeed, there followed an unusually long period of smoothly rising real estate prices and construction. U.S. land values rose three times as fast as other prices from 1956 to 1966 (Sinclair, 1972, p. 40). An old-fashioned real-estate boom finally developed, especially for apartments,

from 1967 to 1972, coinciding with increased inflation. Baby boomers increased the demand for rental housing. Prices of apartment buildings were rising faster than their rents, but "investors didn't care...they were buying into the rental property market in order to speculate on future price increases"(English and Cardiff, 1979, p. 43).

The Tax Reform Act of 1969 had made rental property more attractive. Tax shelters used negative cash flow as a tax advantage. Real estate became a favored hedge against increasing inflation, the stock market having topped out. Real Estate Investment Trust (REIT) assets grew from $2 billion in 1969 to $20 billion in 1973. Commercial bank mortgage loans increased from $66.7 billion in 1969 to $113.6 billion in 1973 (p. 44).

Then vacancies began to increase. "With catastrophic swiftness, the money machine sputtered to a stop. The financial superstructure collapsed; the REIT industry faced bankruptcy" (p. 45). Interest rates were also increasing. Many REITS and developers went bankrupt. Apartment units begun dropped from their peak of 1,047,500 in 1972 to 268,300 in 1975 (p. 46). "More money may have been lost in the Apartment Crash than in any of the more celebrated crashes. But it remains an unheralded financial crisis" (p. 47). It was the worst recession in the U.S. since the 1930s.

The economy of the latter half of the 1970s have been characterized as "stagflation." Land values increased along with other tangible assets as inflation induced speculation and soaring prices. The value of new construction put in place (in constant dollars) and construction contracts by floor space peaked in 1978 (Statistical Abstract, 1990). The recession of the early 1980s followed along the earlier real-estate patterns, but it occurred only a about nine years after the previous bust instead of the eighteen years of the former cycles. One reason could be that the inflation of the latter 1970s artificially took the economy out of the recession without fully liquidating the malinvestments. The 1973-1982 period could be interpreted as one long recession with a bear market speculative rally fueled by monetary inflation. Another factor in the 1975-8 boom was the arrival of huge numbers of World War II baby boomers in the housing market (Crellin and Kidd, 1990, p. 1).

Following the 1982 trough, the economy recovered and another real estate boom was underway. One catalyst was the decrease in marginal tax rates. Another boost to real estate speculation was the raise of deposit insurance to $100,000, which facilitated lending to developments which turned out to be malinvestments. A third government stimulus was the liberalized depreciation deductions of the 1981 tax law, which created tax shelters in real estate. Once again, the government induced real estate speculation, and the result was enormous overbuilding. In the 50 largest metropolitan areas, office space doubled to 2.5 billion square feet. The number of shopping centers rose 57%. Hotels rooms jumped 43%. The population only expanded 8.5%. Between 1984 and 1989, real estate loans increased $366 billion, increasing from 25% to 37% of bank lending. Lending standards were loosened, with loans often covering all of a project's costs. "Lax lending was fed by speculative buying of commercial

properties" (Samuelson, 1990).

The Tax Reform Act of 1986 eliminated some tax-shelter advantages of real estate, which brought down the increase in construction. The value of residential construction peaked in 1986 (Statistical Abstract, 1990), as did net mortgage flows, with declines thereafter especially strong in commercial and multifamily funds (Furlong, 1991). Single-family housing starts and building permits also peaked in 1986, dropping off sharply thereafter. The recession of 1990 followed. The second-derivative of new construction, the percent annual increase in value, peaked in 1986, even though in absolute amounts it continued to rise (Statistical Abstract, 1990, "Value of new construction put in place").

Housing was the weakest sector of the economy in 1990. Multifamily housing is in the deepest recession since World War II (Housing Backgrounder, 1991, p. 1). In the Washington, DC, area, the fundamental reasons for the slowdown in the fall of 1990, which was increasing joblessness, was ascribed to "real-estate overbuilding coupled with cutbacks in bank lending" (Swardson, 1990). The "Washington area economy is suffering from the burst of the ballooning local real estate market," with major banks "pushed over the brink by the sluggish real estate market" (Brenner, 1991).

Interestingly, the national recession has not affected several western U.S. states, where construction employment has continued growing and is a high proportion of employment (Huh, 1991). Moreover, the western states do not always outperform the nation - in the 1981-82 recession, they mirrored the national economy.

As of mid 1991, home building has dropped to levels lower than the 1982 and 1974 real estate depressions, with the lowest number of permits since 1957 and a housing-starts level matching 1946 (Lehman, 1991). Land

prices have dropped 10% to 40% (Salmon, 1991). However, the National Association of Realtors reported ("End of Slump," May 7, 1991) that sales of residences overall were starting to improve. Furthermore, in mid 1991, new home-building firms began operations, showing that the real estate bottom has probably been reached, although the economy as a whole could continue to decline.

The real estate cycle in the U.S. can be summarized with the following table (2).

Peaks in land value	interval (years)	Peaks in construction	interval	Depressions	interval
1818	--	-	--	1819	--
1836	18	1836	--	1837	18
1854	18	1856	20	1857	20
1872	18	1871	15	1873	16
1890	18	1892	21	1893	20
1907	17	1909	17	1918	25
1925	18	1925	16	1929	11
1973	48	1972	47	1973	44
1979	6	1978	6	1980	7
1989	10	1986	8	1990	10

Real estate values and construction have peaked one to two years before the depression, and have stayed at peak levels until the onset of the downturn. The contraction itself evidently pulls down real estate prices, but the historical evidence is consistent with the theory that speculative booms in real estate prices and construction act as an impetus for the downturn itself.

A real estate boom was also taking place in Japan during the 1980s. An article in Barron's characterized Japanese real estate as "the ground

beneath the international paper pyramid,...the base of an economy built on borrowing." Property owners use land as collateral to buy shares in Japanese companies, whose share value itself in some cases is driven up by real estate assets. Prices of residential real estate in Tokyo rose by 93% during the year ending July 1987. Tax laws, zoning, and other government policies are a key ingredient in this real estate boom, artificially restricting the effective supply of land and stimulating demand. As to the effect on enterprise, "exorbitant land prices add to overhead and make expansion of physical plants virtually impossible, reducing profitability" (Mahar, 1987, p. 22). By November 1987, real estate prices had stabilized in Tokyo, still rising in the suburbs but flat in central Tokyo (Schoenberger, 1987b). But the bull market, spurred by low interest rates, continued overall through 1989. In 1990, the bubble began to deflate. Land prices fell some 30% in Tokyo and Osaka as interest rates rose (Blustein, 1990).

According to George's theory, the Japanese economy should have become depressed after some interval of extremely high land values. But many Japanese firms hold long-term leases, and Japanese law gives tenants "an absolute right of residency" (Schoenberger, 1987a). Japanese households have responded by squeezing into smaller units: an average of 500 square feet versus an American average new house size of 1500-1900 (Downs, 1989). Japanese homeowners have also responded by locating further from Tokyo. Demand for real estate has remained high despite the prices.

By 1991, the Japanese economy did react to the land bubble. The Bank of Japan has restricted the supply of credit, raising its discount rate. Some developers and firms with real-estate debts have become bankrupt. By 1991 machinery orders were down and corporate failures had risen 42% from the previous year (Blustein, 1991). Though the saga of the Japanese real

estate boom is still being played out, the experience so far suggests that high land prices alone do not inevitably cause a depression, especially when many rents are tied to long-term leases and residential use responds by economizing on space. It evidently requires a decrease in investment and an increase in other costs such as interest rates to spark the downturn. Evidently George's theory requires complementary institutional factors to take effect.

Interaction Between Cycles

As real-estate cycle history shows, intermediate and minor cycles have occurred in the midst of real estate cycles. Most major upswings are interrupted by minor recessions, but downswings are seldom interruptded by revivals (Hansen, 1964, p. 20). For example, there was an intermediate recession in the 1880s during a real estate boom, whereas the depression following the boom was much more severe. In 1937 there was an intermediate upswing during the Great Depression, which collapsed the following year; producers' equipment recovered, but real estate remained depresed (p. 48). From 1830 to 1933, American business rose above normal 30 times, while land values did so only 5 times. These lesser cycles have a lower amplitude and duration; the range of fluctuations in real estate are greater than those of wholesale commodity prices.

Since most real estate buyers borrow funds, real estate prices and construction are influenced by changes in both income and interest rates. However, the short business cycles have not greatly affected real estate prices. Only minor variations in real estate prices occurred from 1946 to 1960. Values generally moved upward without serious setbacks (Hoyt, 1970, p. 518). According to English and Cardiff, the real-estate "boom-bust forces are much more powerful and dynamic than those of the business cycle" (1979, p. 114). In 1970, for example, in the midst of the apartment boom

of 1968 to 1972, there was a credit crunch and recession. Real income fell .2% in 1970. Yet the apartment boom kept going. Real estate cycles can overcome lesser cycles (caused by credit shocks, for example) when the two are not synchronous. R.C.O. Matthews noted that forces such as urban development "are capable of endowing building booms with considerable momentum of their own, independent of what is happening to investment in other sectors or to national income" (1967, p. 108). William Newman (1935, p. 15) also observed that building cycles arize independently of general business cycles.

The fact that the real-estate cycles coincide with the major booms and busts and that they are not greatly affected by the minor cycles is consistent with the theory that real estate is not simply reacting to other cycles, but is a key factor in causing the major booms and depessions. Harrison (1983, p. 65) points out that peaks in building cycles tend to follow those in land values and precede the depressions. This would be consistent with George's theory that high land costs curtails economic activity.

Raw land is a key feature of the real estate cycle, and it interfaces with business as a focus for construction and the exansion of business. "The most characteristic feature of a real estate boom is the speculation in acre tracts and the sale of lots in subdivisions to small investors" (Hoyt, 1933, p. 163). An example of high land prices driving out investment occurred in "Silicon Valley," California. By 1983, high-tech firms were leaving. "The price of raw land was becoming ridiculously uncompetitive: between 8 and 12 dollars a square foot in Santa Clara compared with 20 cents in Austin and 65 cents in Colorado Springs" (Lessinger, 1986, p. 117).

Another effect of real estate booms on business is a crowding-out of

investment funds. "When homeownership is employed as a leveraged investment, its support can be accepted quite realistically as the sum both of nominal shelter costs plus the surrogate quanta of funds which would once have gone into more traditional forms of investment" (Sternlieb, 1980, p. 259).

The dynamics of real estate demonstrate that land speculation and the construction industry have endogenous forces consistent with the theory of real estate cycles as significant in helping to cause the major cycles.

Georgist versus Other Cycle Theories

Some of the theories of the trade cycle are compatible and complementary with that of Henry George, others posit cluster factors which would boost and then depress revenues, and still others involve costs.

One cost theory is that tax burdens have produced recent recessions. Dunkelberg and Skoburg (1991, p. 3) present the results of a study showing that since 1960, tax increases have led to slowdowns in growth. The major 1974 and 1982 recessions are below the calculated trend line, but taxation could well have been a cost which when added to higher land prices helped to bring growth to a halt.

Joseph Schumpeter (1934, p. 223) proposed that clusters of innovations cause booms and subsequent depressions: new combinations of enterprise "are not evenly distributed through time, but appear discontinously in groups or swarms." The appearance of a entrepreneurs in a new industry facilitates the entrance of others, in increasing numbers. A depression is the economic system's reaction to a boom, its explanation rooted in the explanation of the boom.

Knut Wicksell (1978, p. 211) had a similar theory, in which "technical or commmercial advance cannot maintain the same even progress" as the increase in "needs." Entrepreneurs want to exploit a situtation as quickly

as possible, and large amounts of liquid capital are converted into fixed capital. "As soon as the rate of increase of output begins to lag, a hitch will immediately occur in the development of the economy" (Wicksell, 1965, p. 232). Wicksell held that the money and credit system had great influence on cycles as well.

In general, "real business cycle models assume that random changes in or "shocks" to productivity or technology cause output fluctuations" (Stadler, 1990, p. 763). Real cycle theories also depend on changes about when to consume or in the labor/leisure tradeoff (Plosser, 1989). A problem with such theories is the explanation of the long cycles associated with real estate, which have been of long and fairly regular duration.

However such clusters may apply to minor or intermediate cycles, a different "cluster" theory is applicable to real estate booms, where speculation has come in swarms which affect enterprise and credit. One spark in this case could be large public works projects, such as the building of canals, subsidized railroads, or suburbs.

John Maynard Keynes (1936, p. 313) thought that the trade cycle "is mainly due to the way in which the marginal efficiency of capital fluctuates." "Doubts suddenly arise concerning the reliability of the prospective yield" (p. 317). The costs of production are thought to be higher than they will be later on. "The illusions of a boom," wrote Keynes, "cause particular types of capital-assets to be produced in... excessive abundance...It leads, that is to say, to misdirected investment" (p. 321). A collapse of investment demand due to an unstable marginal efficiency of capital is responsible for the contraction phase of the business cycle. With Georgist theory, the key is the marginal efficiency of land and construction; real estate is the major factor in the Keynsian "capital" schedule, accounting for the instabilities of fickle "capital."

The Austrian-school cycle theory also speaks of "malinvestments." Friedrich Hayek (1933, p. 180) wrote that "The cause of cyclical fluctuations is that because of the elasticity of the value of money, the rate of interest is not always equal to the equilibrium rate, but is in the short run determined by banking liquidity." When the banking system injects money and credit into the economy beyond that warranted by savings, it reduces interest rates, fostering more investments in higher-level capital goods than are warrented by the preferences in the market. When interest rates and prices rise, these malinvested firms fail, inducing the downturn. Though the trade cycle works through the banking and credit system, Hayek also noted that there is no reason why the initiating change, the original disturbance, should be of monetary origin. "Nor, in practice, is this even generally the case" (p. 182) and "it naturally becomes quite irrelevant whether we label this explanation of the Trade Cycle as a monetary theory or not" (p. 183). Hence, the Austrian credit effects could be induced by real-estate factors and then work in tandem with them to cause the bust, as history has shown. Rising interest rates together with rising land prices then choke profits, with real-estate construction a key capital-goods malinvestment.

The political business cycle theories by which they coincide with election cycles also presume a monetary cause, since they have the government attempt to lower unemployment close to election time by generating a temporary inflation which lowers market interest rates (Huh, 1990).

Along similar lines, R.C.O. Matthews (1967, p. 128) stated that "monetary factors must have at least a permissive significance in the cycle: even if fluctuations originate from real forces, monetary conditions must be such as to allow the real forces scope to work themselves out."

Ludwig von Mises (1963, p. 554) also held this view, that "every nonmonetary trade-cycle doctrine tacitly assumes - or ought logically to assume - that credit expansion is an attendant phenomenon of the boom." The historical record repeatedly shows the complementary role played by the banking system in facilitating real-estate booms. As a recent example, previous to the 1990 real-estate crash, developers in the Washington area had obtained loans with no cash down and no payments required for two or three years (Knight, 1990).

Matthews also wrote that fluctuations in investment (expenditure on fixed and working capital goods) lie at the heart of a cycle. Speculation depends upon the creation of favorable expectations, so it will not usually develop unless there is some non-speculative rise in prices in the first place. It occurs when the level of activity is already high. "The chief vehicles of speculation are stocks and shares, real estate (both land and buildings), and non-perishable primary products" (p. 61).

Harry Gunnison Brown (1936, p. 97) argued that during a boom an expansion of credit, even "after business has attained its maximum" and employment is full, takes place due to "the eagerness of the business man, as such, to take advantage of what he regards as good business," since his expenses do not increase as much as his returns. When rentals and interest rates later rise, profits finally turn down. But Brown presumes that the credit expansion takes place in a cental-banking system (p. 100). It is possible that in a free-market banking system, where credit depends on vountary rather than forced savings, interest rates would already rise when business attains its "maximum," cutting off the price increases that later squeeze profits. "Under free banking economic forces reward bankers who make decisions consistent with the maintenance of monetary equilibrium" (Selgin, 1988, p. 174). The resolution of both credit disequilibrium and

of real estate speculation may be necessary in order to prevent business cycles; neither by itself may be sufficient.

Henry George (1975, p. 263) stated that there could be "other proximate causes" than the "specultive advance in land values," though land speculation is the "main cause." The main cause, however, may require complementary causes, such as monetary accomodation and some spur to speculation. This spur can be accounted for in large measure by public works.

The Shock of Public Goods

Adam Smith (1937, Book I, p. 247) noted that "Every improvement in the circumstances of society tends either directly or indirectly to raise the real rent of land, to increase the wealth of the landlord." The rental value of land is a function of the externalities that give a location its value. The provision of public goods by governments provides "rents" in both senses of the word to landowners.

One quantification of this concept was provided in 1962 when the Regional Plan Association computed the marginal capital cost to taxpayers of providing government services to one residence in the New York City area at $16,850. This was for streets, highways, schools, water lines, sewer lines and plants, police and fire protection, libraries, administration, etc. A UCLA study came up with a figure $1000 less for Los Angeles (Prentice, 1976, p. 27). To this must be added the net value of federal government services. The purchase of land in anticipation of the provision of increased services to a new area, and the lobbying for public works and transportation by landowners, can be regarded as "economic-rent seeking", the attempt to capture the expected value of these government services, capitalized in the increased price of land.

As another example, the Metro system in the Washington, DC, area

raised land values around the Metro stations by $2 billion five years after the first trains began rolling, based on the most conservative assumptions, according to a congressional staff survey (Harrison, 1983, p. 221).

Speculative booms have invariably been accompanied by major public works or analogous public subsidies. For example, during the Florida land boom of the mid 1920s, "enormous bond issues were continually being made to obtain money to pave streets where nobody wanted to drive; to build school houses that will not be needed for ten years; and to make various extravagant public improvements" (Platt, 1929, p. 6.). The subsidies which induce speculation are often indirect. Raising deposit insurance to $100,0000 while deregulating the activities of banks lowers the risks to bank owners of speculative lending, which effectively subsidized (by lowering the interest cost) land speculation and malinvested construction.

R.C.O. Matthews (1967, p. 107) stressed that "the nexus between building and transport is part of the mechanism by which building fluctuations acquire cumulative forces." Transportation improvements "act as a shock capable of setting a building cycle in motion." According to William Alonso (1964) the principal tenents of urban land economics were developed in 1926 by Robert M. Haig, who emphasized the complementarity between rent and transport costs.

In 1947, Chicago consolidated its transportation system, coordinating the subways, elevated line, street cars, busses, and suburban railroads. Homer Hoyt (1970, p. 366) observed that the effects of this transportation system on real estate values "can scarcely be overestimated."

The October 16, 1987, issue of the Northern Virginia Sun told the news that "Northern Virginia Leads Building Boom". It stated that "nearly every area that has or plans to have a Metrorail subway station has shown high levels of growth" and that Fairfax County remains a good construction

market because of its proximity to airports, Washington, and access to major highways" (p. 1).

Keynes, in several of his works, argued for public expenditure on public works. That many of his followers believe that continous government intervention is needed to correct a "fundamentally flawed, non-self-correcting market economy" (Rowley, 1987, p. 154) is ironic, since it is the continuous intervention by government, including public works and monetary inflation, that so often induces speculation in the real estate market, with its resultant booms and busts. Every increase in government expenditure that has social value creates an economic shock if it is not offset by a collection of the economic rent produced.

Since World War II, the chief areas of rapidly rising land values have been lands on the fringes of growing cities, "where the provision of new sewer and water lines has made the land ripe for residential building, new shopping centers or new industry" (Hoyt, 1970, p. 544).

Key beneficiaries of these rents often exert political influence for the public works. Richard E. Wagner (1987, p. 209) has pointed out that when property comprises the tax base, liability for debts (from the typical local bond issues to the national debt) would rest with the property owners and debt choices would be capitalized into property values. Likewise, with payment for public works funded by the affected real estate owners instead of by income and sales taxes, the capitalized value of the real estate would be reduced, reducing if not eliminating the resultant speculative forces (and political pressures).

Whereas increases in population and wealth are usually gradual and can be foreseen long in advance, public works can be enacted at one stroke. Though the works themselves take time, the authorization or announcement of the works can be sudden. The speculative spur occurs when the works are

made known, not when they are being built. Hence, public works have a much greater potential for speculative effects than the natural process of population growth or even Schumpeter's entrepreneurial clusters. Since the empirical evidence testifies to the continuing role of public works, along with credit creation, in real estate booms, an important ingredient in a Georgist theory of trade cycles must take public-goods shocks into account.

Real Estate and the Classical Model

Henry George was one of the last of the classical economists. Though he was severely critical of some classical concepts, his economic thought is essentially classical. His business cycle model therefore should fit into the classical macroeconomic model. However, the conventional classical model, where all prices are set by market forces and all markets clear, does not account for unemployment and cycles, a fault criticized by Keynes, who felt his model corrected the classical flaws, or rather made the classical system a special case of his model. The classical macroeconomic model is still criticized for failing to account for the business cycle (cf. Parkin, 1984, p. 192), and by implication, if the model fails, then the free market that is being modeled fails.

Yet the existence of massive unemployment and depressions does not necessarily imply a failure of the classical market or the market. The classical model presupposes an equal access to an unimpeded aggregate production function (output as a function of input factors). If access is obstructed, then the classical free-market economy does not exist, and a model of a politicized market would be more accurate of the actual economy. What is lacking in the classical model production function are the factors of land and government. A more complete model might be as follows:

The production function is $y = f(n,k,l,g)$, where n=labor (number of employed), k=capital goods, l=land, and g=government. Land is defined here in the economic manner as space plus other natural resources. The arguments of the function are quantitative, but the prices of the input factors affect the function f.

Note that a speculative increase in l (land prices and rent) is a real rather than a nominal phenomenon; though credit may induce a speculative increase, the effect is analogous to an increase in the price of labor or the price of oil; these are real supply shocks which lower the production curve as a function of inputs. A unit of input, whether land or labor, now results in a reduced amount of output because of Say's law: the inputs must be paid for by the output, and when the price of inputs rises, a unit of output can be exchanged for fewer inputs, hence a unit of input will produce less output.

Whereas the amount of capital (machines, buildings) changes gradually, the price of land can make rapid and major moves. The factor g represents the net contributions of government, which can be positive or negative. Negative aspects of g include taxes and regulations, which in effect decrease the marginal product per set of inputs, and this too can move quickly and have a major impact. Positive aspects include public goods.

If there is no anticipated increase in the price of land, then the price of land reflects its marginal product for current use. When an increase in demand for land is anticipated and speculation raises its price, then the price of l increases with no additional contribution to output. This lowers and flattens the production curve (where output is on the vertical axis), as does increases in the costs imposed by g by taxes on production and by nonproductive regulations and other costs. Positive g raises the production curve, but land rent absorbs the increase and

speculative rents and prices push the curve down from what it would be without the goods.

At the begining of the real estate cycle, population growth, prosperity, and public works increase the demand for land, and the increase in l at first reflects a greater marginal product of l, along with k and n. In the classical model, all agents are self-interested, including government agents. If the political constitution permits rent seeking, government will redistribute wealth and provide public goods, increasing land costs. The construction industry, effectively subsidized by g, and anticipating gains from l, overbuild, first raising and then lowering aggregate demand. Speculators add to the demand for land, reducing the value of y for given k and n. Not only does industry face increasing costs of l and g, but labor faces higher taxes and housing costs, reducing wages net of these costs, putting upward pressures on labor costs (3). As the production function declines and flattens relative to n and k, production decreases, shifting down the demand curves for k and n. An increasing demand for credit for real estate purchases also raises interest rates, reducing credit for enterprise investment. Busines profits decline. Enterprises fail. The economy falls into a depression.

This story could explain the downswing of a depression, but another change in the classical model is needed to account for unemployment, for in the classical model, markets always clear. Just as there was a change in the production function in the course of the cycle, there is now a change in the labor supply curve. As the demand for labor decreases and workers lose their jobs, those who are out of work grow hungry and face continuing housing costs. Their labor/leisure preference shifts towards wanting more labor at a given wage. The labor supply curve flattens out, especially in the region just to the right of the point where the demand curve cuts it.

A horizontal supply curve at that point reflects those willing to work at the current wage, and its flatness can account for the empirically visible unemployed, many of whom would trade places with those with jobs at the prevailing wage. Thus defined, the existence of unemployment during depressions, when the production function is flat, wages are low, and capital is idle, is explained even without Keynesian "sticky wages" or a failure of interest rates to equilibrate aggregate demand with supply.

One aspect of unemployment not usually considered is the alternative of self-employment. At the margin, employees can become self-employed, and assuming that they can produce at the rate specified by the production function, why don't the unemployed simply become self-employed during a depression? Evidently, access to the production function is impeded and unequal. Those with jobs do not necessarily demand lower wages than the unemployed. High land or rent costs along with high costs of g (tariffs, tight money, controls, monopolies) can act to reduce the profitability of self-employment below the subsistence level (or welfare transfers).

A final change in the classical mode requires the addition of the element of time, as the Austrian school has realized (O'Driscoll and Rizzo, 1985). In the basic classical model, money is not involved; an increase in the money supply is instantly neutralized by an increase in prices. However, as Richard Cantillon realized in his 1755 essay on commerce, it takes time for the effects of the increase to wind its way through the economy, since there is uncertainty and ignorance about its presence and effects. Hence, as the Austrian theory explains, an increase in money may at first lower market interest rates and does not cause an immediate price increase. In the reconstructed classical model, therefore, markets clear, but knowledge is imperfect and money may have a real effect. Perhaps the model is now so far from the basic classical structure that it can be

renamed the geo-Austrian model, combining Georgist concepts on land, rent, and speculation with Austrian concepts of time, money, and capital goods; this geo-Austrian systhesis would then challenge the neoclassical synthesis and its new-classical and new-Keynesian offspring as a macroeconomic model.

Once land costs drop, eliminating the speculative l, the production function rises and becomes steeper, and this is reinforced as the malinvested firms drop out. Interest rates and other prices drop. The economy recovers, unemployment drops, workers reshape their supply curves into more upward-sloping shapes, wages rise, and the a new cycle ensues.

The cycle can be eliminated by applying both Georgist and Austrian remedies. If public goods are paid for by collecting the economic rent, and no other taxes or restrictive regulations are imposed, then negative g and specultive l are eliminated and the model becomes stable. As Austrians propose, the minimization of g would also take government intervention out of the banking and money systems, eliminating the credit inflation that accomodates speculative booms. Free banking and depoliticized money (cf. Selgin, 1988), an element of the market not clearly understood by Henry George (4), is consistent with a free market.

Conclusion and Summary

Real estate is a major component of the economy, and has historically been subject to large and widespread fluctuations. A rapid rise in real estate prices and rents based on future rather than current benefits (induced by public goods not offset by the public collection of rent) is bound to affect business profitability; the question of its exent is an empirical matter. Historical data from the U.S., Great Britain, Germany, and other countries have shown that real estate booms have preceded major depressions. The construction industry plays a major role in creating the boom and subsequent bust, and monetary, regulatory, and public-works

accommodation by government have induced and accommodated the speculative booms. The theory that the major real estate cycles, accommodated by monetary inflation, have significantly contributed to the major depressions is consistent with the historical record.

Whereas the smaller and more frequent business cycles may be due to random shocks or non-real-estate causes, the larger real estate cycles have exhibited similar patterns and, historically, have occurred in regular intervals. A reformulation of the classical model to include land prices and the effects of government would help enable it to account for the business cycle and large-scale unemployment. Austrian concepts complement a Georgist model of the business cycle, adding credit inflation and the role of banking.

Some economists have been paying attention to real estate. Charles Kindleberger, an economic historian, influenced recently by Homer Hoyt's writing, was pointing out the danger of a crash in real estate prices eighteen months before the banking panic and real estate collapse in the Northeaset (Warsh, 1991). A geo-Austrian macroeconomic and business cycle model should have a predictive power that would bring George's insights into the mainstream of economic theory.

Notes

1. Data from Statistical Abstract, 1990.

2. The data from 1818 to 1929 are from Harrison (1983, p. 65), except for building data for the 1909-1929 period, which are from Hansen (1964, p. 41). Data for 1972-1989 are from Statistical Abstract, 1990, housing prices, and "Value of New Construction Put in Place" reports of the U.S. Department of Commerce, Bureau of the Census. The land value peak for 1989 is from the Board of Governors of the Federal Reserve Balance Sheet.

3. The November 4, 1987, Potomac News Weekly Advisor, a weekly newspaper in Prince William County, Virginia, had the front page headline, "Working Poor: County is a mecca for jobs, but a nightmare for housing". The story relates how the cost of housing increased 20% from 1983-86, while salaries in this prosperous area increased 11%. While there is low unemployment, the cost of housing is so high that many residents spend more than 30% of their gross income on housing.

4. In Social Problems (1966, p. 178), George wrote, "it is the business of government to issue money.... To leave it to every one who chose to do so to issue money would be to entail general inconvenience and loss...." Austrian-school studies of free banking (e.g. Selgin, 1988; White, 1984) demonstrate that the market process would reduce note issuers to those generally accepted, and that private note issue would not be inflationary or lead to bank failures, as demonstrated by the free-banking experience in Scotland, Canada, and New England.

References

Alonso, William. Location and Land Use. Cambridge, MA: Harvard University Press, 1964.

Banks, Ronald. "Terra Incognita." In Costing the Earth. Ed. Ronald Banks. London: Shepheard-Walwyn, 1989, pp. 37-48.

Blustein, Paul. "Japanese Real Estate Prices Finally Start Falling." Washington Post, 7 November 1990, pp. G1, G4.

----------. "Japan's Mieno Deflates the 'Bubble.'" Washington Post, 24 February 1991, pp. H1, H9.

Board of Governors of the Federal Reserve System, "Balance Sheets For the U.S. Economy." Washington, DC: 1991.

Brenner, Joel Glenn. "Unsettling Accounts." Washington Post: Washington Business, 6 August 1990, pp. 1, 26-7.

Brown, Harry Gunnison. Economic Science and the Common Welfare. 6th ed. Columbia, MO: Lucas s Brothers, 1936.

Burns, Arthur F. "Long Cycles in Residential Construction." In Economic Essays in Honor of Wesley Clair Mitchell. NY: Columbia University Press, 1935, pp. 63-104.

----------. "The Nature and Causes of Business Cycles." In The Business Cycle in a Changing World. NY: NBER, 1969, pp. 3-53.

Burns, Arthur F., and Mitchell, Wesley C. Measuring Business Cycles. NY: National Bureau of Economic Research, 1946.

Commerce, U.S. Dept. of. Statistical Abstract of the United States, Washington, DC. Various years.

Commerce, U.S. Dept. of., Bureau of the Census. Value of New Construction Put in Place. Various issues.

Cord, Steven. How Much Revenue Could a Land Value Tax Raise? Columbia, MD: Center for the Study of Economics, 1990.

Crellin, Glenn E., and Kidd, Phillip E. Housing in the 1980s: A Retrospective. Washington: National Association of Realtors, 1990.

Cromwell, Brian A. "Recession and the West." FRBSF Weekly Letter, Federal Reserve Bank of San Francisco, 24 May 1991.

Downs, Anthony. "After Tokyo, ,all the world's a bargain." U.S. News & World Report, 30 Jan. 1989, pp. 58-9.

Dunkelberg, William C., and Skorburg, John. "How Rising Tax Burdens Can Produce Recession." Policy Analysis 148 (Cato Institute), 21 Feb. 1991.

"End of Slump / Resale Market Upturn sighted for First Quarter." News Release, National Association of Realtors, Washington, 7 May 1991.

English, John Wesley and Gray Emerson Cardiff, The Coming Real Estate Crash (New Rochelle, NY: Arlington House Publishers, 1979).

Furlong, Fred. "Financial Constrains and Bank Credit." FRBSF Weekly Letter, Federal Reserve Bank of San Francisco, 24 May 1991.

Future of Home Building. Washington, DC: National Association of Home Builders, 1991.

Gaffney, Mason. "Adequacy of Land as a Tax Base." In The Assessment of Land Value. Ed. Daniel M. Holland. Madison: University of Wisconsin Press, 1970, pp. 157-212.

Garrison, Roger W. "Time and Money: The Universals of Macroeconomic Theorizing." Journal of Macroeconomics 6, no. 2 (Spring, 1984): 197-213.

George, Henry. Progress and Poverty. 1879; rpt. NY: Robert Schalkenbach Foundation, 1975.

----------. Social Problems. 1883; rpt. NY: Robert Schalkenbach Foundation, 1966.

Gottlieb, Manuel. Long Swings in Urban Development. NY: National Bureau

of Economic Research, 1976.

Grebler, Leo and Frank G. Mittelbach. The Inflation of House Prices Lexington, MA: Lexington Books, 1979.

Hammond, Peter J. "What to do About Business Cycles?" In Lectures on Schumpeterian Economics. Ed. Christian Seidl. Berling: Springer-Verlag, 1984, pp. 59-75.

Hansen, Alvin H. Business Cycles and National Income. New York: W. W. Norton & Company, 1964.

Harberler, Gottfried. Prosperity and Depression. Cambridge, MA: Harvard University Press, 1960.

Harrison, Fred. The Power in the Land NY: Universe Books, 1983.

Hayek, Friedrich A. The Pure Theory of Capital. Chicago: University of Chicago Press, 1941.

----------. Monetary Theory and the Trade Cycle (NY: Harcourt Brace & Co., Inc., 1933)

Heilig, Bruno. Why the German Republic Fell. rpt. NY: Henry George School, n.d.

Hicks, John D. Rehearsal for Disaster: The Boom and Collapse of 1919-1920. Gainesville: University of Florida Press, 1961.

Housing Backgrounder. Washington, DC: National Association of Home Builders, 1991

Hoyt, Homer. According to Hoyt: 53 Years of Homer Hoyt. n.p.: n.p., 1970.

----------. One Hundred Years of Land Values in Chicago. 1933; rpt. NY: Arno Press & The New York Times, 1970.

Huh, Chan Guk. "Political Business Cycles." FRBSF Weekly Letter, Federal Reserve Bank of San Francisco, 14 December 1990.

----------. "Probability of Recession." FRBSF Weekly Letter, Federal Reserve Bank of San Francisco, 5 April 1991.

Hull, George. Industrial Depressions. NY: Frederick A. Stokes, 1911.

Jones, Frederic J. Catastrophe Theory, Economic Growth, and the Incidence of Land-Value Taxation. n.p., 1991.

Keynes, John Maynard. The General Theory of Employment, Interest, and Money. New York: Harcourt, Brace & World, Inc., 1936.

Knight, Jerry. "Generous Loans Prove Costly for Area Developers." Washington Post, 14 October 1990, pp. H1, H5.

Lehman, Jane H. "Home-Building Prospects Turn Darker." Washington Post, 8 June 1991, pp. F1, F14.

Lessinger, Jack. Regions of Opportunity. New York: Times Books, 1986

Mahar, Maggie, "Shaky Foundation: Speculation Kites Japan's Realty Boom". Barron's, Nov. 9, 1987, pp. 14-24.

Matthews, R.C.O. The Business Cycle. NY: Cambridge University Press, 1967.

Miles, Mike. "What Is the Value of All U.S. Real Estate?" Real Estate Review 20, no. 2 (Summer, 1990), pp. 69-75.

Mises, Ludwig von. Human Action. New Haven: Yale University Press, 1966.

Newman, William H. The Building Industry and Business Cycles. Chicago: University of Chicago Press, 1935.

"Northern Va. Leads Building Boom." Northern Virginia Sun. Arlington, VA, 16 October 1987.

O'Driscoll, Gerald P., Jr., and Rizzo, Mario J. The Economics of Time and Ignorance. NY: Basil Blackwell, 1985.

Parkin, Michael. Macroeconomics. Englewood Cliffs, NJ: Prentice Hall, Inc., 1984.

Platt, Chester C. "Taxation and Land Speculation in Florida." Paper no. 22, International Union conference, 1929.

Plosser, Charles I. "Understanding Real Business Cycles." Journal of Economic Perspectives 3, no. 3 (Summer 1989): 51-78.

Potomac News Weekley Advisor. Woodbridge, VA, November 4, 1987 , p. 1.

Prentice, P. I. Urban Financing for Jobs, Profits and Prosperity. rpt. NY: Robert Schalkenbach Foundation, Inc., n.d. Originally in American Journal of Economics and Sociology, 35, no. 3 (July 1976).

Pribam, Karl. "Residual, Differential, and Absolute Urban Ground Rents and Their Cyclical Fluctuations." Econometrica 8 (January 1940): 62-78.

Rothbard, Murray N. America's Great Depression. Kansas City: Sheed and Ward, 1975.

Rowley, Charles K. "The Legacy of Keynes: from the General Theory to Generalized Budget Deficits." Deficits. NY: Basil Blackwell, Inc., 1987. eds. James M. Buchanan, Charles K. Rowley, Robert D. Tollison.

Sakolski, A. M. The Great American Land Bubble. New York: Harper & Brothers, 1932. Rpt. 1966.

Salmon, Jackueline L. "Market Opens Up to New Builders." Washington Post, 1 June 1991, pp. E1, E5.

Samuelson, Robert J. "The Great Real Estate Bust." Washington Post 4 October 1990, p. A27.

Schoenberger, Karl. "Land Lunacy Is Choking Japanese Cities." The Wall Street Journal, 16 Oct. 1987a, p. 24.

----------. "Japanese Prices For Property Starting to Fall." The Wall Street Journal, 20 Nov. 1987b.

Schumpeter, Joseph A. The Theory of Economic Development. 1934; rpt. New Brunswick: Transaction Books, 1983.

----------. Business Cycles. NY: McGraw-Hill Co., 1939. Rpt. Philadelphia: Porcupine Press, 1982.

Selgin, George A. The Theory of Free Banking: Money Supply under Competitive Note Issue. Totowa, NJ: Rowman & Littlefield, 1988.

Sinclair, Stanley. Reform for our Time. NY: Center for Land Economics,

1972.

Smith, Adam. The Wealth of Nations. New York: The Modern Library, 1937.

Stadler, George W. "Business Cycle Models with Endogenous Technology." Americann Economic Review 80, no. 4 (September 1990): 763-778.

Sternlieb, George and James W. Hughes. America's Housing: Prospects and Problems New Brunswich, NJ: Center for Urban Policy Research, 1980).

Swardson, Anne. "Workers Feel Painful Pinch of Slowdown." Washington Post: Washington Business, 6 August 1990, pp. 1, 22.

Swisher, Kara. "Furniture Firm Files Chapter 11." Washington Post, 3 October 1990, pp. F1, F12.

Thomas, Dana L. Lords of the Land. New York: G.P. Putnam's Sons, 1977.

Wagner, Richard E. "Liability Rules, Fiscal Institutions, and the Debt." Deficits. NY: Basil Blackwell, Inc., 1987.
eds. James M. Buchanan, Charles K. Rowley, Robert D. Tollison.

Warsh, David. "Charles Kindleberger: Premier Recession-Caller Predicts Lengthy Downturn." Washington Post, 16 January 1991, p. F3.

White, Lawrence. Free Banking in Britain: Theory, Experience, and Debate, 1800-1845. NY: Cambridge University Press, 1984.

Wicksell, Knut. Lectures on Political Economy, Vol. II. Fairfield, NJ: Augustus M. Kelley, 1978 (first ed. 1935).

----------. Interest and Prices. NY: Augustus M. Kelley, 1965 (first ed. 1936).

"Working Poor: County is a mecca for jobs, but a nightmare for housing." Potomac News Weekly Advisor. Prince William County, VA, 4 November 1987.