ANSWERS TO STUDY QUESTIONS

Chapter 5

5.1. Property value is the present value of the expected future rents the property could receive. A higher growth rate in future rents will increase the present value of those rents, thereby increasing property value, other things being equal.

5.3. Other things being equal, greater uncertainty about future land rents results in higher current land values and higher current land rents. Greater uncertainty means that rational or optimal development would await higher current land rents in order to justify conversion to urban usage (the irreversibility premium). Other things being equal, this would result in a smaller city size (greater density and/or less urbanization).

5.5. The Burgess concentric ring model suggests that similar types of land uses will tend to locate at similar distances from the center of the city, resulting in concentric rings of similar land uses around the CBD. In contrast, according to the Homer Hoyt sector model, similar land uses do not all lie at a similar distance from the center of the city, but rather cluster along rays or in pie-shaped wedges emanating from the center. Most cities are partly explained by both of these perspectives. The Burgess model explained many of the major features of the typical industrial city of mid-twentieth century America. Most notable was the tendency of higher-income residential neighborhoods to be located farther from the center. The Hoyt theory was that some land uses are more compatible with each other and tend to be found in adjacent sectors. This explained why the upper-income residents tended to locate near the west side of town in cities like Boston and Philadelphia.

5.7. An "edge city" is an activity center almost as large and multifaceted as many a traditional central business district.

5.9. Certain types of land uses tend to be compatible and mutually supporting, bringing a synergy or increase in value to each district and use. Other types of land uses are incompatible and detract from the value of each other if they are located too closely. For example, residents may generally prefer to be located closer to shopping opportunities, as long as they are not so close that traffic congestion and noise reduces the quality of residential life. In this example, the bid-rent is lower near the land use boundary, then rises as distance eliminates the negative externality, then falls as further increasing distance reduces accessibility to the shopping center.

5.11. According to property life cycle theory, property value is the sum of two components: land value and structure value. The land value component of property value is how much the property would sell for if it had no structure on it, that is, the current market value of typical vacant land parcels similar to the subject property only without a structure. Another perspective is that the value of land ownership (distinct from ownership of a built structure) derives purely from the development or redevelopment option value that such ownership entails. Structure value is simply the difference between the current property value and whichever definition of land value one prefers.

5.13. The fact that the value of the newly redeveloped property includes the construction cost component over and above the site acquisition cost component implies that the depreciation of the structure renders the growth rate of the property value generally less than the growth rate of the location or usage value.

5.15. The economic land value component is very small just after redevelopment, because the building is then at the HBU for the site, so the profitability of further redevelopment, if any, is a long way off in the future. Over time, the redevelopment option

value component will grow if the structure depreciates physically or functionally, or if the HBU of the site as if vacant evolves and changes over time away from that which the current structure can serve. As investments, call options are much more risky than their underlying assets (in this case, the usage value of the built property), and hence require a much higher expected return. Furthermore, all of that return must be earned in the form of appreciation of the option value, as the option itself pays no dividend. Thus, the curve of the land value in the exhibit traces out an expected exponential growth that is quite rapid between the reconstruction points in time. The appraisal or legal definition of land value tends to be a roughly constant percentage of the usage value of the site and grows at a much lower rate (if at all), and with much less volatility than the economic definition of land value.

5.17. a. Indicated current use value = \$180,000/0.09 = \$2,000,000

b. Implied cap rate based on purchase price = \$180,000/\$4,500,000 = 4%. The developer is willing to pay significantly more than current use value because there is significant option value in the land; the ownership of the land gives the developer the right to change the use to a more profitable one (e.g., on office building) in the future.

5.19. $0.3 = (1 + x)^{30} \rightarrow x = 0.3^{1/30} - 1 = 0.039 \rightarrow 3.9\%$ per year property value depreciation below the growth rate in location value. The growth in location value may be either positive, negative, or zero.