

# BUILDING ECONOMICS CAPITAL VALUE THEORY

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## PRIMARY SOURCES

Bon, R. Building as an Economic Process. Prentice Hall, 1990.

Fisher, I. The Nature of Capital and Income. Macmillan, 1923.

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## STOCKS, FLOWS, AND FUNDS

*A stock is an absolute quantity.*

For example, a reserve of oil is a stock.

*A flow is a stock spread over time.*

- For example, a flow of petrol into the engine of a car from a stock of petrol in the tank.
- A flow does not necessarily represent a decrease or increase in a stock of the same substance.
- For example, the flow of food consumed by humans does not come from a stock.

*(Economic) capital is a fund of services*

- Buildings yield a flow of building services.
- Use of those services does not necessarily imply ownership.
- In the final analysis, people desire a flow of building services rather than a building itself.
- Capital is a fund of services which satisfies the psychological and physiological needs and wants of people.

*The use of a fund requires duration.*

- The decumulation of capital involves using or wasting capital and by reversing the process of accumulation. (Capital does not come into existence by an accumulation of services).
- The use of building services requires duration.
- For example, a house with an economic life of 100 years cannot provide shelter for 100 families for one year.
- The decumulation of a stock can take place in an instant whereas that of a fund cannot.
- A fund is therefore not a stock.

*The difference between a fund and a stock characterises the difference between capital and non-capital goods and the difference between fixed versus circulating or working capital.*

- Money is not (economic) capital.
- Money facilitates the transfer of capital goods and the transformation of capital into any form desired.
- The functions of money – medium of exchange, measure of value and unit of account, a store of value, and standard of deferred payment.
- Money also reduces transaction costs.

## **THE PRODUCTION PROCESS (DIAGRAM – see PowerPoint PDF)**

*The fund and flow elements comprise the factors of production.*

- The fund elements represent the agents of the process.
- The flow elements are used or acted upon by the agents.
- Funds include Ricardian land (inert space), capital, human labour and expertise which includes entrepreneurial skills.
- Input flows include resources in natural state, processed materials, and maintenance factors.
- Output flows include products and waste. There is always waste. Pollution cannot be totally eliminated.
- Physical capital always undergoes physical depreciation and its continual maintenance and replacement is a cost.

*The major function of production is to maintain intact both the physical capital that yields services and human capital itself.*

- The wealth of a community comprises all those material objects that are subject to property rights - real estate that comprises the immovable wealth of land and lands improvements, commodities that comprise moveable wealth, and human capital.
- The income of a community is that flow of services yielded by the wealth of the community.

*Capital, land, and labour are usually designated as complementary factors of production.*

- We designate the economic endowment of nature as land or uses of land.
- Land and labour are the fundamental powers or factors of production.
- Capital, as a production factor, is inconceivable without land or labour.
- Capital is often designated as the third factor of production.

*Capital and land are distinct concepts.*

- Land is a permanent asset that does not depreciate.
- The permanent character of land should not be confused with the temporary character of land use.
- Both capital and land use are characterised by nonpermanence.
- Land use is not permanent. Land is often rented or leased for a definite period and for a limited use.

*Indirect production increases the period or the number of production stages.*

- Some goods can be simply gathered and consumed directly.
- Other consumption goods must be produced by means of production goods such as machines and tools.
- Indirect modes of producing consumption goods tend to be more productive but also entails a sacrifice of time.

## **CAPITAL, INCOME, AND INTEREST**

*Capital is productive, the opposite to income, and is a provision for the future or a reserve.*

- Although economists may differ in their definitions of what capital is, they do concur that capital is productive, the opposite to income, and is a provision for the future.

*The value of capital is derived from the value of income.*

- Consider the yield of wheat crop from fertile land versus that from average land.
- Although a wheat crop depends on the fertility of the land that yields it, the value of the crop does not depend on the value of the land.
- On the contrary, the value of the land depends on the expected value of its crops.
- The value of real property ultimately depends on the value of goods and services produced with its help.

*The bridge or link between income and capital is the rate of interest.*

- If the rate of interest falls, the capital value (capitalised value of expected income) rises, and vice versa.
- This rise or fall in capital value is relatively great for durable goods like land and buildings, and relatively small for transitory goods like clothing.
- A rise in the value of capital, or capital gains is not present income.
- Capital gains are capitalisation of future income.
- Capital gains are not realised until a building is sold.

*The interest rate is an exchange rate between present and future values.*

- The interest or discount rate used reflects inter-temporal choices.
- Interest stems from the need to make systematic trade-offs between the present and future allocation of scarce resources.
- The interest or discount rate can be thought of as an exchange rate between present and future values.

*The concept of capital is inherently related to that of expectations of the future.*

- Capital consists only of those quantities of economic goods that are available now for use in the future.
- Durable consumption goods can directly satisfy human needs both now and later.
- Durable production goods can indirectly satisfy human needs only in the future.

### **TIME PROFILE OF AN ECONOMIC PROCESS**

*The time profile of an economic process is the life cycle of that process.*

- The time profile of an economic process should be the life cycle of the process.
- By doing so, all relevant inputs and outputs are accounted for.
- The life cycle is the economic life cycle and not the physical life cycle.
- The only requirement concerning the physical durability of capital is that it extends beyond the economic horizon of an economic agent.
- For this purpose, we need a model of an economic process.

### **CAPITAL VALUE MODEL (DIAGRAMS – see PowerPoint PDF)**

*Input-output model.*

- Consider a firm that converts a flow of inputs into a flow of outputs.
- The economic process consists of the construction of a plant, its operation over a period, and its ultimate dismantling.
- The time profile of inputs displays a hump associated with construction expenditures.
- If plant reconstruction is anticipated, it can be represented by another such hump.
- At any date where there is a net input, then monetary funds are borrowed outside of the process and interest is paid on the borrowed monetary funds.
- At any date where there is a net output, then the output is invested outside of the process or used to repay past debts.

*Each process can be represented by a capital value profile that shows the discounted value of the remainder of the process in each period.*

- This is not a market value, but a value anticipated in planning.

*The capital value profile is dependent on the interest rate.*

- The capital value profile, unlike the input-output profile, will depend on the interest rate.
- A fall in the interest rate will raise the capital value curve because in that case the future net benefits will be discounted less (and vice versa).
- A fall in the rate of interest will lengthen the economic life of a process, and shift the economic horizon to the right.

*Requirement for viable process.*

- Consider the capitalised values of inputs and outputs separately.
- The capitalised value of output flow must be at least as great as the capitalised value of inputs.
- In other words, the discounted value of net outputs must be non-negative at every stage during the duration of the process.

*The yield of the process.*

- A sufficient rise in the rate of interest will reduce the capital value at the beginning of the process to zero as shown by the lower curve.
- This rate of interest can be identified as the yield of the process, or its internal rate of return.
- At this value we will be indifferent between investing and saving.
- If the current rate of interest were higher than the internal rate of return, then it would not be profitable to carry out the process. The capital value at the beginning of the process would be less than zero.

*Speculation is unavoidable.*

- Interest rate shifts may occur at any time during the entire economic process.
- A degree of speculation is always involved at the beginning of an economic process.
- Speculation ceases only upon termination of the process.

*Market interest rate test of viability.*

- The test of viability of an economic process is that it should yield at least the market rate of interest.

*The decision to terminate the process is based on economic horizon.*

- The decision to terminate the process must be based on economic considerations.
- It must be more profitable up to the economic horizon than to any other period.
- The present value of the process must be greater for the economic horizon than for any other time-horizon.