



Why Capital is Productive

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Why Capital is Productive

#14

1. Biological growth

2. Ecs. of Longevity: spread cost over several years, lower annual cost -- ϵ of lifespan w.r.t. K is >1 .

However, annual cost does not drop with n much after a few years, so watch it.

3. Produce on spec, i.e. in advance of the market. This is how stores get stocked; ships get laden with cargo; etc.

4. Ease division of labor: same material proceeds downstream from one process to another, with value added at each stage.

Goods produced in different places are assembled in one place, where many combinations are possible. This applies to firms, and also to cities, societies, and economies.

5. Advances subsistence to those who need it, during time needed to liquidate the thing produced.

6. Goods once produced can go through hard conditions that their producers could not: pans on the fire, wells underground and underwater, satellites in orbit, etc.

7. Great ideas are embodied in physical form, for all to use. Early industrialists produced jigs to guide the hands of unskilled workers on the assembly line, for example.

8. An older theory of interest said that the cause of interest is the reproductive power and productivity of biological capital, which grows for the benefit of humankind, even while we sleep. Inert capital in machines and buildings, it was said, is not productive, but must pay interest to compete with biological capital.

How would you demonstrate and measure the productivity of capital invested in buildings, to show it is productive in the

same sense as biological capital, and may be measured in the same scale? Give a numerical example.

A building is productive because the sum of cash flows it yields exceeds its cost of construction (even after deducting an adequate charge for the use of land during its lifespan). Building things to last lets the cost be spread over several years, an "economy of longevity." Whenever the ϵ of productive lifespan (n) w.r.t. capital cost (K) exceeds one, there is an economy of longevity¹. This is one of several ways (other than biological growth) that capital is productive.

Mathematically, the increase yielded by capital in buildings is measured by a process of summing up individual PIPO evaluations. The PIPO compound interest factor is the basic block with which all the mathematics of finance is built, by summation. Thus, the measure of increase used for biological assets like trees is the same as that used for buildings. They are therefore consistent and commensurable.²

The ROR on a tree is $(F/K)^{1/n} - 1$

The ROR on a building is $a(1-I^n)/K$

The second equation was derived from the first, by summation. (For a complete answer and extra credit, show how this was done.) Therefore the RORs are consistent and commensurable.

9. It is cheaper to build something once, to last a long time, than to build a new one every year, month, or day. This is an

¹Whether this economy is enough to repay its cost, however, depends on the effect on DCF, which depends on the discount rate.

²A lot of paper and ink and time have been wasted by analysts who try to show that PIPO models are inconsistent with flow models. The "Austrian" economists, early devotees of capital theory, used mostly PIPO models, and generalized therefrom. Later critics have alleged that flow models are basically different, and the Austrian generalizations are invalid. These critics are wrong on this point. For full proofs, see M. Gaffney, 1976, "Toward Full Employment with Limited Land and Capital," in Arthur Lynn, Jr. (ed.), Property Taxation, Land Use and Public Policy, (Madison: Univ. of Wisconsin Press), pp. 99-166.

extension of the Baumol principle of deliveries: it is cheaper to take a big load once than two half-size loads.

10. What other examples can you add?

11. Capital can wait around patiently, 'on tap' for the moment when you need it.