A Life Contingency Approach for Physical Assets: Create Volatility to Create Value

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Abstract

A firm will replace a physical asset at the end of its useful life. This fact demonstrates that there is a notion of mortality implicit in the way an enterprise manages its physical assets. We propose a theory that there is also an efficient time, which is random and observable, to replace a physical asset. Separate economic and financial models converge on agreement that: 1) there is only one instant in time an asset must be replaced in order to minimize the present value cost impact to the enterprise, 2) this efficient instant is observable and a function of both the enterprise's cost of capital and readily obtainable current calendar year information, and 3) the time to this efficient instant is random and may be infinite. Through a policy of coordinating the timing of replacements with these efficient, observable instants, lost efficiencies are recovered. Such a policy necessarily creates volatile, fortuitous, future cash flows, which are dealt with through capital adequacy or risk transfer, rather than deferral or other forms of scheduling for convenience. The efficiency gains and accompanying value creation may be material if the enterprise's assets are mostly physical.

The potential role of the extended service contract to implement such a policy and to transfer the resulting uncertain cash flows between entities is discussed. A broad comparison to prior art capital expenditure planning methods is made. Possible tax consequences due to the interaction between efficiency and fortuity are discussed. A policy event-based loss estimation method using expert input and simulation is presented for forecasting these long duration expenditures and calculating actuarially sound service fees for the aforementioned extended service contracts.

> *"In this world nothing can be said to be certain, except death and taxes."*
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> —Benjamin Franklin to Jean-Baptiste Leroy
> in a letter dated Nov. 13, 1789