Optimal choice Between FIFO and LIFO

Shyam Sunder

The decision to select one of the two accounting methods for inventory valuation – first-in, first-out (FIFO) and last-in, first-out (LIFO) – involves consideration of several factors of which potential tax effect of the accounting method is often the most important. While the general relationships of inflation, inventory levels, rate of taxation, etc., to the potential tax savings have been well understood for a long time, realistic decision models which quantify the impact of alternative accounting procedures on the economic value of the firm are conspicuously absent. It is difficult, then, for a manager who is weighing the choice of the two accounting methods explicitly to determine the impact of such a decision on the value of the firm.

The purpose of this study is to present procedures to estimate the difference between the net present value of tax payments under the two inventory valuation methods. Sunder [1976] developed a simple estimation procedure under conditions of certainty and level year-end inventories. Three extensions are presented here by relaxing various assumptions. First, the assumption of level year-end inventories is relaxed to compute the present value of cash-flow differences with changing inventory level within a deterministic framework. In a second extension, deterministic rates of price changes are replaced by a stochastic process to compute the expected present value of cash-flow differences. Finally, the deterministic inventory level is replaced by a stochastic process in the third extension allowing us to compute the expected present value of cash-flow differences for a given sequence of price changes. Procedures for handling simultaneous uncertainty in the price changes and inventory levels are also discussed. The stochastic models result in increased realism and relevance at the expense of only a small increase in computational costs.

The models proposed here can be used by a firm to choose between LIFO and FIFO on the basis of the difference between the expected net present value of cash flows associated with the two methods. Once this amount has been determined, it can be adjusted for the difference in operating costs of the two accounting methods. The expected value of net cash flows depends on the future marginal tax rates, anticipated rates of change in the price of inventories, cost of capital of the firm, pattern of changes in the year-end inventories, and the number of years for which the accounting change is to remain effective. Stochastic variation of year-end inventories permits realistic estimates of tax effects when there is some probability that the basic inventory may be liquidated before the firm's decision horizon. The decision model also provides information on the consequences of subsidiary decisions regarding the identification of particular inventories which may be included in the LIFO system and the size and number of inventory pools.