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EVALUATION OF BOOKKEEPING CHANGES: IMPLICATIONS
FOR ACCOUNTING RESEARCH AND POLICY DECISIONS

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College of Commerce and Business Administration
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Summary:

The term "bookkeeping" change has been used in the accounting literature to mean a change in accounting method of no economic importance, one that will not induce a market reaction. Tests which examine the market's reaction to an accounting change can only be conducted after the change has been implemented and reported. The results of such tests, however, are most needed prior to implementation to allow standard setting bodies to identify those changes which are bookkeeping, and thereby prevent the allocation of resources to issues which are capable of a simple disclosure solution.

In this paper we derive a set of conditions that, when met, provide a method for identifying bookkeeping changes prior to their implementation. Implications of our analysis for policy-making bodies are considered. We also demonstrate, using research efforts that investigated foreign currency translation method changes, as example, how the derived set of conditions can be employed to evaluate empirical work done to study the market's reaction to accounting changes.

EVALUATION OF BOOKKEEPING CHANGES: IMPLICATIONS
FOR ACCOUNTING RESEARCH AND POLICY DECISIONS

Gonedes and Dopuch [1974, p. 91], in their summary of the empirical work done investigating market reaction to accounting method changes, noted that:

"...the results of the above studies are consistent with the statement that the capital market does distinguish between changes that appear to be reporting changes of no economic importance and those that appear to have economic implications."

The purpose of this paper is to examine in depth the first type of accounting change mentioned by Gonedes and Dopuch, often referred to in the literature as a "bookkeeping" or "cosmetic" accounting change.

In 1972, Beaver criticized the APB for allocating too large a portion of its time and resources to the debate of bookkeeping changes which, he states, are nothing more than "trivial" disclosure issues. He urged that the:

"FASB should shift its resources to those controversies where there is nontrivial additional cost to the firms or to investors in order to obtain certain types of information. Whether such information should be a required part of reporting standards is a substantive issue" (p. 52).

Gonedes and Dopuch [1974] reiterated Beaver's recommendation:

"...it seems reasonable to produce information conditional on both procedures, rather than wasting resources by deliberating over which method should be used" (p. 116).

By the nature of empirical research, all of the evidence concerning accounting changes used by the three authors to support their common position is *ex post*. The effects, or lack of any, of an accounting change on security prices cannot be observed until after the change has been implemented and reported. However, in order for the FASB and other standard setting bodies to better allocate their

time and resources to substantive issues, is not identification of those issues which are capable of a simple disclosure solution necessary prior to their discussion and implementation? Time and resources can only be saved if trivial disclosure issues can be identified as such ex ante, thereby prompting a decision to simply disclose--not debate.

In this paper, we will derive a set of conditions in sections I and II that, when met, provide a method for identifying bookkeeping changes, changes of no economic importance, ex ante. Implications of our analysis for policy making are considered in section III. We then demonstrate how the conditions derived for identifying bookkeeping changes can be applied to evaluate empirical work done to study the market's reaction to accounting changes. This is accomplished by analyzing research efforts that investigated foreign currency translation method changes. A summary section completes our paper.

I. Accounting's Portrayal of Economic Reality

The activities of a firm may be viewed as a series of economic events. Accounting reports are a means to communicate the results of measuring selected portions of these events so that users may infer, from these reports and other available information, the relevant aspects of the firm's activities.

Users have to interpret, or decode, the accounting numbers to make inferences as to the economic reality. Their conclusions clearly will be influenced by the accounting numbers which are published, and the procedures whereby these numbers are generated. Two features of

accounting data complicate this decoding process. First, the summarized nature of accounting data necessarily implies that the map of the economic reality provided will be incomplete, that is only certain facets will be portrayed. Factors that could influence selection of the events included in accounting reports are: a) the ability of the accountant to adequately represent the event in monetary terms, b) relative efficiency of alternative information sources vis. a vis. accounting reports, and c) requirements of the regulatory bodies. Regardless of the reason(s), the key point to be emphasized is that accounting measures and reports only selected economic events.

Second, even when accounting numbers attempt to reflect the same aspect of the economic reality (e.g., gains or losses on translation of historical cost financial statements of foreign subsidiaries), the alternative accounting procedures currently allowed may yield a one-to-many mapping. Alternative rules of measurement may not only assign different symbols to the same property, but also may emphasize different properties of the same event.¹

The key implication of the above discussion is that a user's reconstruction of reality is, at best, incomplete and may also differ depending upon the accounting procedure chosen.

To illustrate, assume that x denotes a two-dimensional economic reality to be described. If alternative accounting procedures f and

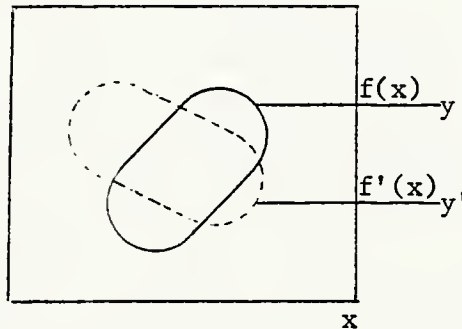
¹This is analogous to photographing a cup (economic reality) from two different angles. The photograph cannot represent the cup completely from either angle, and the representation will differ depending upon the angle from which it was taken. It might, for example, show a handle in one case which is completely hidden in another.

f' denote the means of encoding economic data into summarized accounting form, and y and y' are the accounting numbers generated by the alternative accounting methods, we may state that:

$$f(x) = y$$

$$f'(x) = y'.$$

This can be illustrated as follows:



If the accounting procedures (f and f') mapped the total economic reality, then given any pair (f,y) or (f',y') , a user would be able to infer the underlying reality, x , in symbols:

$$h(f,y) \rightarrow x, \text{ and}$$

$$h(f',y') \rightarrow x$$

However, given the incomplete mapping suggested above, the user's decoding process might produce the following results:

$$h(f,y) \rightarrow \hat{x}$$

$$h(f',y') \rightarrow \hat{x}$$

Where; $\hat{x} \neq x, \hat{x} \neq x$

and

$\hat{x} \neq \hat{x}$.

This outcome implies that neither accounting method permitted a complete representation of the economic reality, and that the representation that each portrayed is not identical to that provided by the other. (See Appendix I for a three-dimensional extension of this analysis.)

Given this analysis, a change in accounting method from f to f' cannot be dismissed as trivial simply because the underlying economic reality is unaltered. The accounting change itself may furnish new information so as to induce a new inference as to the economic reality, essentially causing a move from \hat{x} to \hat{x} when users decode the accounting numbers.

To date, researchers [e.g., Kaplan & Roll, 1972] have asserted that given an efficient market this move will not occur when it is possible to apply certain rules or procedures to derive accounting numbers generated by one policy from those generated by the alternative policy. The next section will consider what conditions are sufficient to support this claim, and thus avert a move from \hat{x} to \hat{x} .

II. Accounting Changes

The AICPA [1978] defines an accounting change as a "change in (a) an accounting principle, (b) an accounting estimate, or (c) the reporting entity..." As Gonedes and Dopuch [1974] noted, this includes

both changes which stem from economic events, and those which arise without anything of economic substance occurring.

The term "bookkeeping change" or "cosmetic change" is used to describe the phenomenon where a different accounting measurement number is obtained by employing a different accounting procedure, while the underlying economic reality remains unchanged. Using the notation developed in the preceding section, we will consider a change to be bookkeeping in nature if and only if the underlying economic phenomenon x remains unchanged and the following conditions are met:

$$(1) \quad g(f, f', y | I) = y', \text{ and}$$

$$(2) \quad h(f, f', y' | I) = y,$$

where g and h are the rules necessary to translate from one alternative accounting procedure to another, and I , discussed in the next section, is the available information set.

Whereas g and h can be analytically developed, the availability of their required parameter values in the information set I , is an empirical question. Lack of these parameter values could prevent translation from one accounting alternative to the other and thus allow one to advance the possibility of a move from \hat{x} to \hat{x} . Consequently in order for an accounting change to be classified as a bookkeeping change, both the translation functions and their parameter values must be available to users.

Employing the above two conditions, three possible situations exist concerning changes of no economic importance. First, when both conditions (1) and (2) are satisfied, translation in either direction

is possible and any method change could clearly be labeled as bookkeeping.

The second situation would be when one, but not both, of the conditions was satisfied. In other words, given a set of available parameters, translation in one direction could be fairly easy while translation in the opposite direction could be difficult, if not impossible. For example, in the case of investment credits, translation from the deferral to the flow-through method can usually be effected directly from information supplied by financial statements, but translation from the flow-through to the deferral method requires a generally unavailable parameter, the asset's expected life. (See Appendix II for details.) This parameter value must either be obtained directly from the company or must be estimated by the translator. Under these and similar circumstances, users may infer different economic realities even though the accounting reports tried to convey the same phenomenon. This perception change can be argued to have been caused by the accounting change itself. Classification of these changes as bookkeeping is therefore not appropriate.

Third, when neither conditions (1) nor (2) are satisfied, translation in either direction is not possible. Employing the above argument, this type of change clearly does not qualify to be labeled as cosmetic as one could posit the possibility of a move from \hat{x} to $\hat{\bar{x}}$. Only those changes that satisfy both conditions (1) and (2) will qualify as bookkeeping changes--changes that should not of themselves affect security prices.²

²For sake of completeness, the possibility of indirect translation should be noted, for when it is not possible to directly translate back and forth between accounting methods, one may be able to convert both alternatives to some common third method. As long as the translation functions can be identified, and the required parameters are available, these changes, according to our derived conditions, qualify as bookkeeping changes.

The possible lack of parameter values, along with the previously discussed incomplete portrayal of economic reality provided by the accounting data, cause us to challenge a dichotomization of accounting changes based solely on their economic consequences. Assuming the semi-strong form of the EMH, we propose the following trichotomization:

- i) where the change has a discernible economic effect, the market's interpretation of the impact of this on future cash flows will be impounded into security prices;
- ii) where there is no discernible economic effect, and it is possible to translate from one accounting method to the other, the accounting change will not, of itself, affect security prices (a bookkeeping change);
- iii) where there is no discernible economic effect but it is not possible to translate, the accounting change may cause a shift in prices from what they would have been given the alternative accounting method.

Since it is logically not possible to demonstrate the nonexistence of the required parameter values, the burden of proof falls on researchers who assume an accounting change to be a bookkeeping one. Given our operational definition of a bookkeeping change, researchers can and need to support their assumption through demonstration. For example, if a change from the full cost to successful efforts procedure of accounting for drilling costs were to be considered a mere bookkeeping change, one would need to develop the translation functions and demonstrate that the necessary parameter values can be obtained.

Failure to do so would result in an unsubstantiated argument to the effect that the choice of method will make no difference to users. Each accounting change represents a special case, and researchers should therefore incorporate the above considerations into their research design and conclusions. An example of this type of analysis is presented in Appendix II of this paper.

Thus far we have examined some of the possible implications our analysis has for accounting researchers. We next consider how our ideas could be utilized in the policy-making process of standard setting bodies.

III. Policy Implications

Bookkeeping changes, assuming the definition derived above, can further be categorized according to the information set, I, which provides the required parameter values. Here we partially borrow from efficient market's literature and partition the information set available to users as follows:

- I. Financial statements;
- II. Publicly available information, including financial statements;
- III. All information, including inside information.

Category I includes quarterly reports and essentially all information which a stockholder might receive. Category II expands this set by embracing freely available statutory information furnished by corporations such as the Form 10-K. Category III encompasses both I and II and, in addition, incorporates information to which only insiders have access--corresponding to the Strong form of market efficiency.

According to Beaver [1978], the SEC's recent statement of objectives seems to emphasize the informational role of disclosure as opposed to its protective role. This disclosure objective appears to be essentially the same as the objective set forth by the FASB in its Tentative Conclusions on Objectives of Financial Statements of Business Enterprises [1976]. As Beaver [1978] suggests, their merging objectives may be one reason for the blurred boundaries that currently exist between these two authoritative bodies.

Applying the above 3-way information set partitioning, any SEC disclosure mandate has the effect of making category III information category II information, unless firms had previously provided this information voluntarily. The costs involved with this type of move include the direct costs of additional disclosure (e.g., production of the information), the indirect costs of additional disclosure (e.g., adverse effects of the disclosure on competitive advantage), and the costs of regulation [Beaver, 1977]. In addition, any questions concerning property rights to the information should be resolved prior to shifting it from category III, or in other words, making it publicly available (e.g., ASR No. 190). That is, is the public's right to know more important than the company's right to privacy in this case?³

The FASB's concern, on the other hand, is disclosure within category I, the financial statements. It is therefore interested in category III or category II information becoming available in annual reports. Whereas FASB Statement No. 14, Financial Reporting for Segments of

³An example of information protected from disclosure is certain trade secrets or technical information on products.

Business Enterprises, could be considered a disclosure standard in that it requires public disclosure of inside information, a move from category III to category I, the FASB exposure draft dealing with financial reporting and changing prices simply requires disclosure of information in the financial statements which is already available to investors through category II sources. In addition to the disclosure costs described above, the advantages of financial statement disclosure must also be weighed against those of alternative sources. Accounting numbers are of importance only insofar as they either provide relevant information about economic events at lower cost than would be incurred if the information were obtained from other sources, or provide a credibility feature, due to the audit process, which is not supplied by the alternative sources [May and Sundem, 1973].

The above information categories provide accounting policy makers a framework with which to evaluate disclosure decisions. With respect to accounting changes, these distinctions become important if we consider the conceivable responsibility of an accounting system to include within the financial statements all necessary parameter values to allow users to derive all potential permutations. As a primary step, policy makers should determine the required translation parameters and the information category or categories from which these parameters are available. This knowledge, in conjunction with our analytically derived criteria to justify a change being classified as bookkeeping, would permit policy makers to determine if they are in fact debating nothing more than a trivial disclosure issue. This is important for, as Beaver warned in 1973, many reporting issues are capable of a simple disclosure solution and do not warrant an expenditure of FASB time and resources in their resolution.

Currently when an entity changes accounting methods, required disclosures include: 1) the cumulative effect of the change reported on the income statement, adjacent to extraordinary items, in the year of the change; and 2) the effect of the change on income for the current and immediately preceding year. In some cases, the policy must also be retroactively applied. Before expanding these requirements, both the disclosure costs and the existing as well as potential alternative sources of information should be considered. It is also necessary to introduce the costs of translation into the analysis. While these translation costs may be insignificant when sufficient information to allow translations is provided in the financial statements (category I), the users' translation costs will generally increase as one progresses through category II to category III.

In short, if a proposed change in accounting policy satisfies the conditions of "bookkeeping" change, then the primary issue to be considered is the relative costs of the procedures since no change in available information is anticipated. Bookkeeping changes, while not changing the information set, may shift the cost structures for the preparers and users of accounting reports. In situations where informational differences are anticipated, the rights to information issue must be addressed in addition to the cost issue.

The next section of this paper attempts to apply our analysis to one of accounting's many policy problems, the treatment of foreign currency translation.

IV. Foreign Currency Translation--An Application

A system of floating exchange rates has prevailed ever since the abandonment of the Bretton Woods agreement in 1971. Between this

liberation date and the issuance in 1975 of FASB Statement No. 8, Accounting for the Translation of Foreign Currency Transactions and Foreign Currency Financial Statements, several conceptually distinct translation methodologies developed to deal with varying exchange rates. Dukes [1978, p. 11] identified 3 main reporting methods employed by U.S. corporations in accounting for their multinational activities prior to FASB 8; the current/noncurrent (CNC), the monetary/nonmonetary (MNM), and the modified monetary (Hybrid) methods. Variations among the methods arise due to the different combinations of exchange rates, historical (H) and current (C), utilized to translate accounts. These translation rules are summarized in Table 1.

SUMMARY OF FOREIGN CURRENCY TRANSLATION PROCEDURES

| | <u>Current/Noncurrent</u> | <u>Monetary-Nonmonetary</u> | <u>Hybrid</u> ⁴ |
|----------------------------|---------------------------|-----------------------------|----------------------------|
| <u>Current Accounts</u> | | | |
| Cash | C | C | C |
| Accounts Receivable | C | C | C |
| Inventories | C | H | C |
| Prepayments | C | H | C |
| Current Liabilities | C | C | C |
| <u>Noncurrent Accounts</u> | | | |
| Monetary Investments | H | C | H |
| Non-monetary Investments | H | H | H |
| Fixed Assets | H | H | H |
| Long-term Debt | H | C | C |

- Table 1 -

⁴It should be noted that this hybrid method, which Dukes labels as modified monetary, is but one of many that existed in practice prior to FASB Statement No. 8. Pakkala [1975] found that in 1972 one-half of the 50 largest multinationals employed this hybrid method or some minor modification of it.

"Empirical evidence suggests that multinational companies employ all the methods described above and others" [Choi and Mueller, 1978, p. 71]. To support their claim Choi and Mueller cite a research study conducted by the Financial Executives Institute [1973] prior to the issuance of FASB Statement No. 8 which found that while some companies did adopt a strict CNC or MNM approach, the majority employed some hybrid method blending the two approaches. Dukes' [1978, p. 28] pre-FASB Statement No. 8 survey also provides concurring evidence. His sample of translation methods used by multinational corporations revealed the following usage distribution:

| | |
|-------------------|-----|
| CNC | 49% |
| MNM | 20% |
| Hybrid Variations | 31% |

FASB Statement No. 8 was issued in an attempt to aid comparability among firms by eliminating the latitude enjoyed by firms in their selection of a translation method. It required that as of January 1, 1976, all companies employ the temporal method of translation. Under the temporal principle, cash receivables and payables, and assets and liabilities carried at present or future prices are translated at the current rate and assets and liabilities carried at past prices are translated at applicable historical rates [FASB, 1975]. In other words, accounts are translated so as to retain their original measurement bases.

Within an historical cost framework, the results derived employing the temporal method are virtually identical to those provided by the MNM method.

"The translation procedures to apply the temporal method are generally the same as those now used by many U.S. enterprises under the monetary-nonmonetary method. The results of the temporal method and the monetary-nonmonetary method now coincide because under present generally accepted accounting principles monetary assets and liabilities are usually measured at amounts that pertain to the balance sheet date and nonmonetary assets and liabilities are usually measured at prices in effect when the assets or liabilities were acquired or incurred" [FASB, 1975, p. 57].

Given the above distribution of translation methods employed in practice prior to FASB Statement No. 8, its issuance would appear to have required over two-thirds of all corporations with overseas operations to change their accounting procedures in order to conform [Bryant and Shank, 1977].

Table 2 summarizes the required parameter values that would be needed to transform one foreign currency translation method to another. The Roman numerals refer to the category of information from which these parameters could be obtained. It should be noted that in cases when the financial statements of all foreign subsidiaries are publicly available, it might be possible to obtain the information from category II, rather than category III as indicated in Table 2. This is one disclosure expansion that surfaced during the FASB's recent re-evaluation of the conclusions it reached in FASB No. 8.

"Foreign profits and asset disclosures should be expanded. Domestic and foreign assets are not necessarily available one to the other and a reader needs to understand where the assets are and what the financing methods are" [Ernst & Whinney, 1979, p. 17].

This recommendation can also be taken as evidence to support category III classification of these parameters. To reemphasize, while we

cannot prove nonexistence, in light of our operational definition researchers who claim a change to be cosmetic must provide evidence to the contrary.

Our framework does reveal for policy makers the unavailable parameters, and thus could justify debate of this translation method issue. Given our criteria any change in policy would not classify as bookkeeping and therefore could have an impact on information which could lead to changes in security prices.

TRANSLATION PARAMETERS

| | <u>CNC-MNM & vice versa</u> | <u>CNC-Hybrid & vice versa</u> | <u>MNM-Hybrid & vice versa</u> |
|-------------------------------|-------------------------------------|--|--|
| Relevant Exchange Rates | II | II | II |
| *Foreign Inventories | III | -- | III |
| *Foreign Prepayments | III | -- | III |
| *Foreign Monetary Investments | III | -- | III |
| *Foreign Long-term Debt | III | III | III |

*Identified as to country and amount.

- Table 2 -

A preliminary study by Bryant and Shank [1977] found that the securities market did not react differentially to firms required by FASB 8 to change translation policies. The authors refer several times in their paper to the "bookkeeping changes" mandated by FASB Statement No. 8.

"Thus, there is some evidence to show that economic hedging has resulted from the bookkeeping changes mandated by FASB #8" (p. 17).

"If FASB #8 is viewed as 'just bookkeeping' these findings are consistent with the efficient market hypothesis" (p. 23).

No analysis, however, was undertaken by Bryant and Shank to ascertain whether translation method changes qualify as bookkeeping changes. Lack of any market reaction does not provide sufficient grounds to support classifying a change as bookkeeping. Had the researchers considered the publicly unavailable parameter values discovered above, they might have avoided the potentially inappropriate labeling.

Dukes, in his 1978 study, acknowledged the possibility of a market reaction being induced by altered market perception of an unchanged economic reality, our type iii accounting change, when he commented that: "The disclosure requirements of Statement No. 8 may result in an increase in the informational content of financial statements which could result in a new equilibrium in the market" (p. 21). Consequently, when he found no systematic market reaction to the issuance of FASB Statement No. 8, he did not label the translation method changes as bookkeeping changes as Bryant and Shanks had, but concluded that abnormal security return behavior should not be observed if:

"...(1) capital markets are efficient, (2) no new information is disclosed by Statement No. 8, (3) management does not alter its decision making in any significant way, and (4) Statement No. 8 produces only minor ancillary side effects (e.g., small altered probabilities of violation of debt covenants)" (p. 23).

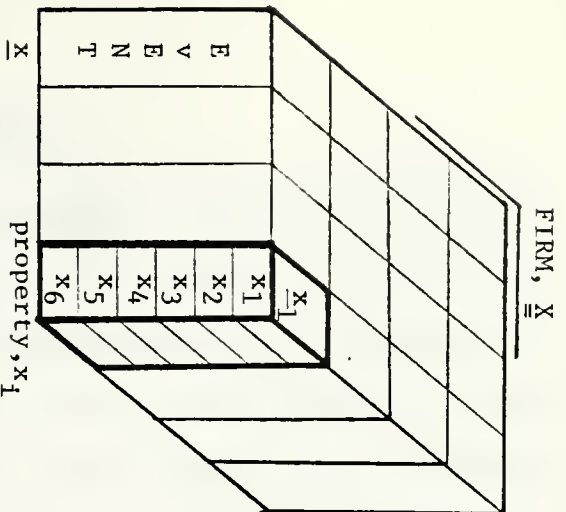
Our criteria for a change to be classified as a bookkeeping change, a change which will not of itself affect security prices, are consistent with these conditions set forth by Dukes.

IV. Summary

The main argument of this paper concerns the possible assumption by researchers that when the underlying economic reality remains

unchanged, changes in accounting policies are merely bookkeeping changes, and the existence of an efficient securities market implies that these accounting changes will have no impact on stock prices. Our concern is that by changing the information available to users, a different understanding of the economic reality may result unless the existence of translation functions, with a complete set of publicly available parameters, and/or alternative information sources effectively provide the same information to the market before and after an accounting change. The implication for research is that failure to demonstrate that the condition set out in this paper has been met, may cast some doubt upon the conclusions utilizing association tests between security prices and accounting numbers. A framework was also provided for policy makers with which to justify their consideration of changes in accounting policy.

APPENDIX I: A Summary of Accounting Report and the Inferences Based on the Reported Signals (A three dimensional analysis)



- x : accountable economic entity (matrix)
- \underline{x} : one event (vector)
- $F(\cdot)$: Firm's accounting policy
- $f(\cdot)$: accounting procedure for an event

Given a firm, \underline{x} , the accounting report of the firm, y , is the result of applying accounting policy on the economic events of the firm:

$$\begin{aligned} F(\underline{x}) &= F(x_1, x_2, \dots, x_n) \\ &= [f_1(x_1), f_2(x_2), \dots, f_n(x_n)] \\ &= y \end{aligned}$$

Consider, for example, the event x_1 : It is possible to have alternative accounting procedures such that,

$$\begin{aligned} f(x_1) &= f(x_1, x_2, x_3, x_6) = y_1 \\ f'(x_1) &= f'(x_1, x_2, x_4, x_5) = y'_1 \end{aligned}$$

The users of the financial statements will need to interpret the data ($f_1 y_1$) or ($f'_1 y'_1$):

$$\begin{aligned} h(f, y_1) &\longrightarrow \hat{x} \\ h(f', y'_1) &\longrightarrow \hat{\hat{x}} \end{aligned}$$

Ideally, $\hat{\hat{x}} = \hat{x} = \underline{x}_1$,

but, due to the incomplete mapping it is possible to end up as:

$$\hat{\hat{x}} \neq \underline{x}_1, \hat{\hat{x}} \neq \hat{x}_1 \text{ and } \hat{\hat{x}} \neq \hat{x}.$$

APPENDIX II

APB Opinion No. 4, "Accounting for the 'Investment Credit'," permits firms to account for an investment tax credit (ITC) by either the flow-through or the deferral method. Under the flow-through method, the full benefit of the ITC is reflected in current income as a reduction of the tax charge. Under the deferral method, the ITC is capitalized and amortized as a credit against current and future income, the period of benefits corresponding to the estimated useful life of the investment made that gave rise to the ITC.

To determine if a change from one of these two methods to the other qualifies to be labeled as a bookkeeping change, we must first develop the necessary translation functions and then investigate the availability of the required parameters.

TRANSLATION RULES

1) Deferral (D) → Flow-through (F)

$$ITC_{F \cdot t} = ITC_{D \cdot t} + (DTC_{\cdot t} - DTC_{\cdot t-1})$$

where:

ITC_{kij} = Investment tax credit under method k
for asset i at period j.

DTC_{ij} = Deferred investment tax credit balance
for asset i at period j.

2) Flow-through → Deferral

$$ITC_{D \cdot t} = \sum_{i=1}^I \sum_{j=t-L_i}^t \frac{ITC_{Fij}}{L_i}$$

where:

L_i = Economic life of asset i.

PARAMETER VALUES

| | <u>Deferral → Flow-thru</u> | <u>Flow-thru → Deferral</u> |
|--|-----------------------------|-----------------------------|
| Beginning and ending balances of deferred investment tax credit ($DTC_t + DTC_{t-1}$) | I | -- |
| Investment tax credits charged against net income (ITC_{kij}) | -- | I |
| Life of assets (L_i) | -- | III |

While translation from the deferral method to the flow-through method can be effected directly from category I information, conversion in the opposite direction requires a generally unavailable parameter, the asset's life. Based on our definition the change under investigation, given the above analysis, cannot appropriately be classified as a bookkeeping change. Due to their inability to translate, users may perceive different economic realities thereby causing a move from \hat{x} to \hat{x} . Research efforts that categorize changes between ITC accounting methods as bookkeeping changes, solely based on lack of a market reaction to the change, should therefore be questioned.

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