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## Faculty Working Papers

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

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#636

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Summary:

The tests, which examine the market's reaction to accounting changes, to identify bookkeeping changes can only be conducted after the changes have been implemented. However, the results of such test is most needed, prior to implementation, during the evaluation of the proposed changes.

In this paper we derive a set of conditions, that when met, provide a method for identifying bookkeeping changes, ex ante. Implications of our analysis for policy making are considered. We also demonstrate how the derived conditions can be applied to evaluate certain empirical market findings by analyzing research efforts that investigated foreign currency translation method changes.





Gonedes and Dopuch (1974, p. 91), in their summary of the empirical work done investigating market reaction to accounting policy 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 the past, tests examining the market's reaction to accounting changes have been used to identify bookkeeping changes--changes where no evidence of abnormal security behavior is observed. This type of ex post research, which assumes that the impact of accounting changes can be both observed and isolated, can only be conducted after the changes have been implemented. It is therefore not possible to know the results of such research when it is most needed, prior to implementation, during the evaluation of the proposed change by policy makers.

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 derived conditions can be applied to evaluate certain empirical market findings 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 constitute a series of economic events. Accounting reports are a means to communicate the results of measuring selected portions of these events so the users may infer, based on the reports together with other available information, the relevant aspects of the firm's activities. Three major processes of accounting reporting (communication) are then (1) measurement, (2) transmission and (3) interpretation. The primary item of interest to the accountants is the impact of rules of measurement upon the user's ability to interpret.

Accounting measurements are typically applied to only selected dimensions of the economic events. The major factors that influence the selection of the events to be included in the accounting reports are a) the ability of the accountants to adequately represent the event in monetary terms, b) relative efficiency of other 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 measurements are applied to only selected events.

Once the events to be measured are selected, we need to select the rule(s) of measurement, assignment of symbols, to be used. Alternative rules not only assign different symbols to the same property but also emphasize different properties of the same event.<sup>1</sup> Much of the efforts of the rule making bodies are to develop "better" rules of

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<sup>1</sup>This 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.

measurements. The selection of appropriate accounting procedures must consider decisions to be made by the users of accounting reports.

The key implication of the above discussion is that the users reconstruction of the reality based on the accounting reports will be at best incomplete, and may also differ depending upon the accounting procedure chosen.

To illustrate, let the matrix  $\underline{x}$  denote the various economic events of the firm. Based on the accounting policies adopted by the company certain events will be selected to be measured and reported in the accounting reports. Let the vector  $\underline{x}$  denote an event, encompassing various properties of the economic reality, being described. If alternative accounting procedures  $f$  and  $f'$  denote the means of encoding selected properties of  $\underline{x}$  into summarized accounting form, and  $y$  and  $y'$  are the accounting numbers generated by the alternative accounting methods, we may state that:

$$f(\underline{x}) = y$$

$$f'(\underline{x}) = y'.$$

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,  $\underline{x}$ , in symbols:<sup>2</sup>

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

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

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<sup>2</sup>In this paper we are ignoring the situations where many to one mapping occurs. That is, different economic situations yield same accounting numbers;  $f(\underline{x}_1) = y$ ,  $f(\underline{x}_2) = y$  and  $\underline{x}_1 \neq \underline{x}_2$ . Further note that the significance of this difference should be evaluated based on its impact on user decisions.

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

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

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

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

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

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 summary presentation).

Given this analysis, an accounting change (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  $\hat{\underline{x}}$  to  $\hat{\underline{x}}$  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  $\hat{\underline{x}}$  to  $\hat{\underline{x}}$ .

## 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:

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

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

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



Given the above two conditions, three possible situations exist. 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 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 while 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. It is therefore only those changes

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<sup>3</sup>For 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.



that satisfy both conditions that qualify as bookkeeping changes-- changes that will not of themselves affect security prices.<sup>3</sup>

The possible lack of parameter values, along with the previously discussed incomplete portrayal of economic reality provided by accounting data, causes 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 nonexistence, 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 the appendix of this paper.

Thus far we have examined some of the 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, using 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, corresponding to the Semi-strong form of market efficiency. 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 information partitioning, any SEC disclosure mandate has the effect of making category III information category II information. The costs involved with this type of move include the direct costs of disclosure (e.g., production of the information), the indirect costs of 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?<sup>3</sup>

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

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<sup>3</sup> An example of information protected from disclosure are certain trade secrets or technical information on products.

Business Enterprises, could be considered a disclosure standard, category III to category I, the FASB exposure draft dealing with financial reporting and changing prices simply requires disclosure of information already available to investors through category II sources in the financial statements. Therefore, in addition to the disclosure costs described above, the advantages of financial statement disclosure must be weighed against those of alternative sources. Accounting numbers are of importance only insofar as they either provide 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 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> <sup>4</sup>
<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 -

<sup>4</sup>It 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 &amp; vice versa</u>	<u>CNC-Hybrid &amp; vice versa</u>	<u>MNM-Hybrid &amp; 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)."

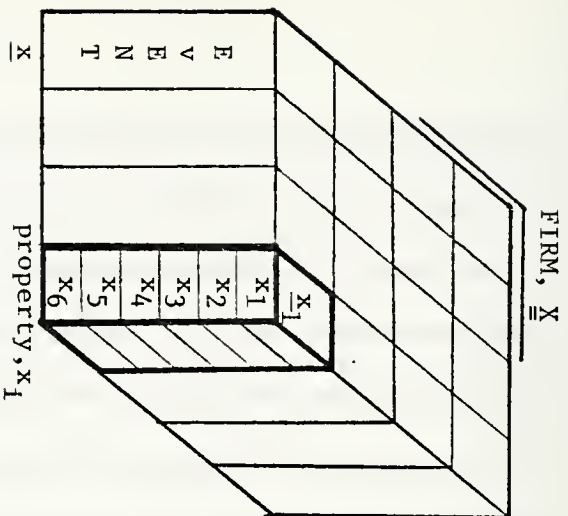
Our criteria for a change to be classified as a bookkeeping change, a change which will not of itself affect security prices, are consistent with these conditions set forth by Dukes.

#### 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



$F(\cdot)$ : 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:

$$\begin{aligned} F(\underline{x}) &= F(\underline{x}_1, \underline{x}_2, \dots, \underline{x}_n) \\ &= [f_1(\underline{x}_1), f_2(\underline{x}_2), \dots, f_n(\underline{x}_n)] \\ &= \underline{y} \end{aligned}$$

Consider, for example, the event  $\underline{x}_1$ : It is possible to have alternative accounting procedures such that,

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

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

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

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

but, due to the incomplete mapping it is possible to end up as:  
 $\hat{x} \neq \underline{x}_1$ ,  $\hat{x}' \neq \underline{x}_1$  and  $\hat{x} = \hat{x}'$ .



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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