The income smoothing

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THE INCOME SMOOTHING HYPOTHESIS

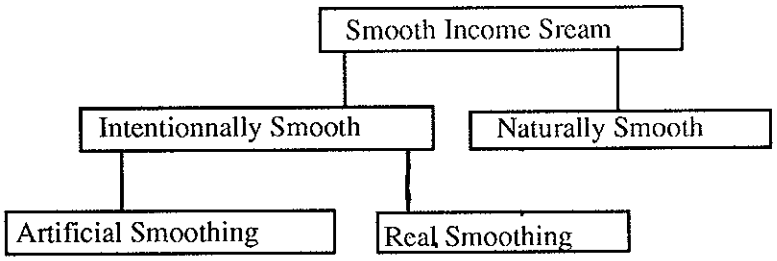
Smoothing of periodic earnings has been advocated as an appropriate objective for business firms. According to the income smoothing hypothesis, accounting choices are used to reduce earnings fluctuations rather than to maximize or minimize reported earnings. The accounting literature has extensively discussed and tested this hypothesis. Actually, this literature is mainly devoted to the identification of income smoothing. Most empirical tests do support the hypothesis that firms smooth their earnings. Unfortunately, only a weak proportion of the literature deals with the explanation of such a behavior. The purpose of our doctoral thesis is, firstly, to review earlier studies of income smoothing and to offer a methodology for identifying income smoothing behavior of French firms, secondly to explain this behavior. It will lead us to test several hypotheses which are supposed to improve our understanding of this behavior.

I. IDENTIFICATION OF SMOOTHING INCOME BEHAVIOR.

1. An analysis of critical issues : definition.

Income smoothing is defined as a relatively low degree of earnings variability about some income trend. The magnitude of the desired adjustment depends upon the prospective level of current earnings relative to the one which is considered as normal.

The necessity to distinguish between the potentially different types of smooth income streams in order to determine which accounting number is smoothed and how it is smoothed has been recognized by Dasher et Malcom (1970) and by Eckel (1981). Types of income smoothing are presented in the following figure :



An income stream is naturally smoothed if the income generating process inherently produces a smooth income stream. On the contrary, intentionnally smoothing is the result of actions taken by managers. Real smoothing represents management actions undertaken to control underlying economic events and therefore it affects the firm's cash-flows. Artificial smoothing is the result of accounting manipulations which do not affect these cash-flows. For instance, the fact that managers decide to spend X instead of Y on research in a given year describes a real smoothing action in so far as the earnings and cash-flows are affected by the expended amount but the accounting policy is not. On the other hand, artificial smoothing is achieved when managers decide which, if any, research projects will be capitalized and the relevant depreciation life for those capitalized projects.

Consequently, the identification of the object or variable which is smoothed is of main interest. In the literature, many different income measures have been assessed as smoothing object. Some studies tested for the net income (Beidleman 1973), others tested for ordinary income (Ronen and Sadan 1975 ; Brayhaw and Eldin 1989), for net income per share (Cushing 1969), for operating net income per share (Barnea, Ronen and Sadan 1976), or for ordinary income per share (Barnea, Ronen and Sadan 1976)....

In prior research, numerous models have been used to assess the income smoothness or variability. The relevance of the models which has to be used depends on the way managers manipulate accounting data. In so far as the nature of this manipulation is unknown, several models which all imply a specific earnings trend line have to be tested. For instance, firms whose

normal earnings are supposed to change by a constant amount each year should be described by the following equation :

$$E_t = a + b\,t + u_t$$

E_t : Object being smoothed
t : time
u_t : deviations of the actual observations of earnings from the linear time trend the residuals which have not been adequately smoothed.

On the other hand, the normal level of earnings for firms which maintain a constant rate of growth is best described by the following equation :

$$\text{Ln } E_t = a + b\,t + u_t$$

2. Smoothing of income : some empirical evidence in French firms.

Most studies try to show that smoothing comes from an intentional action without considering first that some firms do not intend to smooth their earnings. On the contrary, White (1970) selected the smoothest firms from those included in his sample. But his approach fails in its ability to capture management's intentions. Observing the manipulation of accounting variables on income is important for detecting intentional smoothing but it demands the identification of smoothing instruments. Both Copeland (1968) and Beidleman (1973) agree that the smoothing instruments chosen must not commit the firm to any particular future action and it must be considered within the domain of "Generally Accepted Accounting Principles".

There is a great deal to support multi-period studies which examine some earnings number with respect to time. Such studies are clearly superior to others which examined the smoothing effect for a single period in order to identify a pattern of behavior consistent with smoothing (Moses 1987). Copeland (1968) showed that a period of almost 6-8 years is an optimal period to detect a smoothing behavior.

In light of the earlier studies, we identified a behavior of income smoothing in a sample of 45 French firms listed on the Paris Stock Exchange. We followed three steps :

1) The first step consisted in exhibiting the smoothing of an income stream.

The smoothing of net income, ordinary income, operating gross income and operating net income was tested during seven years. An income presents a low variability if the coefficients of variation for the change in the income time series are closed to zero. T-tests were computed. Another methodology consists in calculating the coefficients of determination for a linear model and for a semilogarithmic model and then in studying the significance level of the regressions.

2) The second step consisted in separating natural smoothing from artificial smoothing.

Following Imhoff (1977), we compared the coefficients of determination of the sales with the coefficients of determination of the object of smoothing. As sales and earnings are related, if the first one are lower than the second one, we can conclude that the smoothing is intentional. Eckel (1981) proposed the same approach but he calculated the coefficients of variation for his demonstration.

3) The last step consisted in showing the manipulation of several accounting variable instead of only one variable.

Beidleman (1973) studied the relation between the residuals of a linear model describing the smoothing object with the residuals of a linear describing the smoothing variable. The test of the hypothesis is based on the correlation between the residuals of this two regressions. Correlation coefficients and tests of the significance of the relationships between the time-series residuals are obtained by regressing the residuals.

We followed the same approach for the net income and we studied the manipulation of the depreciation expenses, the provisions and the levels of inventories.

Based on a sample of French firms, our conclusions are consistent with the smoothing hypothesis. T-tests of the coefficients of correlation allow us to conclude that the earnings are smoothed. 69% of firms exhibit high coefficients of determination for the linear model. This model gives better results than the semilogarithmic model. One main difficulty was to show that smoothing is intentional. As sales are less variable than earnings, it seems that managers manipulate the sales. Depreciation expenses, provisions are also manipulated by managers in order to smooth the net income.

II. WHY DO MANAGERS VOLUNTARY SMOOTH THE EARNINGS BY THE MANIPULATION OF ACCOUNTING VARIABLES ?

Our research aims at determining if income smoothing in French firms is related to the will to enhance the value of the firm or to the will to respect contrat's commitments.

Most of the literature assumes that smoothing is imposed by external users of accounting information, mainly the shareholders in so far as smoothing can affect the value and the risk of the firm. In order to explain the link between income smoothing and the value of the firm, we must refer both to the efficient market hypothesis and to the functional fixation hypothesis. On the other hand, the "positive accounting theory" proposes to consider the manager's interest in reported accounting numbers, political costs and contracting costs have to be considered in order to explain this smoothing behavior.

A. Income smoothing and the value of the firm.

According to the market efficiency hypothesis which stipulates that investors are not fooled by cosmetic manipulations of earnings though accounting tools, such manipulations should affect the value of the firm only if they modify the level of risk of the firm or if they change investors' expectations about its future cash-flows.

1. Can investors be fooled by accounting numbers manipulations ?

According to the functional fixation hypothesis, stock markets can be misled by accounting changes because investors react to earnings release without considering the procedures used to produce accounting numbers. Such an hypothesis contradicts the efficient market hypothesis, which implies that the stock market reacts in an unbiaised fashion to all information, including information about accounting procedures changes. In order to determine if investors can be fooled by cosmetic manipulations, most researches use event studies to analyze the market reaction when an accounting change is reported.

Obviously, this methodology cannot be used to asses the impact of smoothing on investor's behavior since income smoothing implies long-range

effects due to the manipulation of several accounting devices. So, we consider the empirical literature devoted to the market reaction at the announcement of an accounting change in order to derive relevant consequences about the impact of accounting income smoothing on the value of the firm. First, we have to study separately accounting changes without tax effect [1] and then accounting changes with tax effects [2]. As the adoption of LIFO allows to save taxes in a context of inflation, it increases the firm's cash-flows and therefore the value of the firm should rise. But, the adoption of LIFO also decreases the net reported income. So, if investors are fooled by accounting manipulations of earnings, the market can react negatively to LIFO while LIFO increases the firm's cash-flows.

An important literature described the market reaction to income changes that are associated with changes in accounting techniques [3]. The methodology is based upon the market reaction near the date of the accounting change's announcement. The design involves the use of the market model to isolate the stock price changes associated with specific events from the market-wide price changes. The regression residual provides a measurement of the market's adjustement to the accounting change.

The results of these studies are inconclusive : a reaction of the market is sometimes shown when an accounting change without tax effect is publicly known, sometimes it is not.

When a manager adopts LIFO instead of FIFO to evaluate firm's inventories, in an efficient market, we except a positive reaction due to a cash-flows' rise. The empirical tests exhibits either a rates of return's increase or decrease. The results are also inconclusive.

These tests face different limitations. First, they often confuse the announcement of the accounting change with the announcement of earnings. It is therefore difficult to conclude whether the market reacts to the report of the accounting change or to the report of earnings. Secondly, it seems that there is a short-range inefficiency of the market and a long-range efficiency. Third, these studies emphasize the fact that an accounting change seems to alter the

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[1] For example, the switch from accelerated to straight-line depreciation for book purposes only, the method for income tax purposes continues to be accelarated depreciation.

[2] For example, the adoption of LIFO to evaluate inventories rather than the use of FIFO.

[3] Archibald (1972) ; Ball (1972) ; Cassidy (1976) ; Comiskey (1972) ; Davis (1990) ; Kaplan and Roll (1972) ; Mlynarczyk (1969) .

firm's risk but more often the research design does not take this feature into account.

When a manager adopts LIFO instead of FIFO to evaluate firm's inventories, in an efficient market, we except a positive reaction due to a cash-flows' rise. The empirical tests exhibits either a rates of return's increase or decrease. The same limitations as previously can be advanced.

Market reaction studies show that investors are likely to react to an income smoothing behavior even when smoothing does not affect the cash-flow or the risk level of the firm.

2. Can income smoothing affect the cash-flows of the firm ?

There is no empirical test about the impact of an income smoothing behavior on the value of the firm. This is one of the reasons why we wish to determine if income smoothing is able to affect the value of the firm by testing the following hypotheses :

H1 : Ceteris paribus the value of firms which produce a stable stream of earnings is higher than the value of firms which do not produce regular earnings.

In order to test this hypothesis, we will observe the price earnings ratios (PER) of two samples of French firms. The two samples will be determined by the methodology used in the first part of our research which allows us to identify two types of firms : firms with smoothed earnings versus firms with irregular earnings. We will control different variables such as the industry of the firm, its size, its level of risk... Then, we will compare the PER of these two samples with univariate tests (parametric and nonparametric).

3. Can income smoothing affect the risk of the firm ?

Beidleman (1973) advances the idea that income smoothing can decrease the risk of a firm. His argument is not supported by Ronen and Sadan (1981) in a context of efficiency where investors have diversified portfolios. But, Lev and Kunitzky (1974) have empirically shown that real smoothing could decrease the risk of the firm.

Beidleman suggests that "smoothing represents an attempt to counter the cyclical nature of reported earnings and thereby tends to reduce the correlation of a firm's expected returns with returns of the market portfolio".

His argument demands to exhibit an association between accounting and market measures of risk. Numerous researchers[4] have shown a relation between these two measures of risk. But, even if accounting-based systematic risk is directly related to market-based systematic risk, whether smoothing income over time decreases accounting systematic risk is an empirical question that cannot be asserted a priori.

Furthermore, Ronen and Sadan (1981) argue that, in the context of an efficient market, the unsystematic risk component contained in the firm's earnings is diversified away. Hence, it shoud not be assumed that the income smoothing affects capitalisation rates and, thus, the value of the firm.

Lev and Kunitzky (1974) hypothesize that the extent of smoothness of the firm's operations should be negatively associated with its common stock risk (overall or systematic). Several financial statement variables are cross-sectionally regressed on the two common stock risk measures. The accounting measures of risk are used as independent variables.

The smoothing measures for accounting numbers are significantly associated with both risk measures. The larger the smoothing measure (indicating high volatility or lack of smoothing), the higher the risk. The coefficients of the smoothing variables are shown to be statiscally significant in every regression. Smoothing indicators should therefore be associated with common stock risk measures.

In order to study the impact of smoothing on the risk level of the firm, we aim at testing :

H2 : Ceteris paribus, smoothed earnings firms exhibit a level of risk which is inferior to the one of firms with irregular earnings.

The methodology will be the same as previously. It will be based on univariate tests about the overall and unsystematic risk of the firm. We will also

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[4] Beaver, Kettler and Scholes (1970) ; Beaver and Manegold (1975) ; Jacquillat, Levasseur and Pene (1976).

used multivariate tests to show that the income smoothing's measure is related to market measures of risk. We expect a negative relation.

4. Can income smoothing modify the investor's expectations of the firm's cash-flows ?

Several researchers introduce the asymetry of information between investors and managers to explain smoothing. In this context, the role of accounting information is supposed to convey openly what otherwise constitutes inside information. Barnéa, Ronen and Sadan (1976) suggest that managers use smoothing to enhance the investor's ability to predict future cash-flows. This idea was developped by Ronen and Sadan (1981) and by Trueman and Titman (1988).

Ronen and Sadan (1981) proposed a model in which the manager is motivated to smooth earnings because his compensation scheme is increased by a stable stream of earnings, because his wage is related to the volatility of earnings.

Trueman and Titman (1988) show that, within a market setting, an incentive exists for a manager to smooth income that is independant of either risk aversion or restricted access to capital markets. The market setting allows to analyze the effect of income smoothing on stock prices because income smoothing is supposed to affect the perceived probability of bankruptcy.

Trueman and Titman assume that some firms can shift income across periods while others cannot. Furthermore, claim holders cannot fully observe each firm's operation and they are therefore not sure of the firm flexibility to shift income. Firms with the flexibility to shift income across periods can, in general, project lower volatility that can firms without this flexibility.

This analysis provides a reason for a corporate manager to rationnally smooth the reported income in order to lower claim holder's perception of the variance of the firm's economic earnings.

In such a signaling context, we propose to show that accounting income smoothing can affect the investors' expectations of firm's cash-flows by testing a third hypothesis :

H3 : Ceteris paribus, firms which smooth their earnings by manipulations of accounting devices (artificial smoothing) exhibit a value which is higher than the one of the firms which do not smooth their reported earnings.

If income smoothing is a signal to the market, we expect that accounting income smoothing affects the value of the firm. Our first hypothesis concerns all the types of income smoothing (natural or intentional) where as the third hypothesis only concerns the artificial smoothing which has no impact on the cash-flows of the firm.

Until now we have considered that the main purpose of income smoothing was firm value maximisation because of its impact on the cash-flow, the level of risk or because smoothing is able to signal attractive growth opportunities. But, the smoothing behavior can also be explained by political and contracting costs in an agency setting.

B. Smoothing in an agency setting.

Studies of the economic consequences of accounting choices (Watts and Zimmerman 1986) have proposed factors which are able to explain different accounting actions across firms. Examples include taxes, political costs, contractual relationships, and ownership control.

Moses (1987) tested for the association between smoothing and variables commonly used to proxy for particular economic factors. He selected discretionary accounting changes as a smoothing device and first, he identified two samples of firms according to the degree of smoothness of their earnings : firms which smooth by the manipulation of an accouting change and firms which do not smooth their earnings. Then, he porposed different explanatory variables :

- Firm size/political costs : Firms in the public eye are subject to actions by government that impose costs. Large fluctuations in earnings may attract the attention of regulators. Large upward earnings fluctuations may be perceived as a signal of monopolistic practices ; large downward fluctuations may signal crisis and cause regulators to act. Consequently, larger firms may have a greater incentive to smooth.

- Market share/political costs : Market power increases the probability of antitrust activity.

- Employee costs : Evidence indicates that union-negociated wage increases over time are positively associated with accounting earnings. Union demands will be sensitive to fluctuations in earnings. One would expect smoothing behavior to be more strongly associated with firms that face strong employee or union groups.

- Bonus compensation : Bonus plans may provide for a management compensation committee to award a bonus based on reported earnings. A lower and upper bound between which changes in earnings can affect the bonus award may be specified. The main result of these influences may be a behavior of smoothing.

- Ownership control : Management with small ownership control has greater incentives to adjust performance measures and may be more likely to smooth earnings.

- Three variables related to earnings are also included in the analysis, both as independent predictor variables and as control variables: the earnings variability, the earnings incertainty and the accounting change impact on the level of earnings.

Findings provide evidence that smoothing is associated with firm size, the existence of bonus compensation plans, and the divergence of actual earnings from expectations. In addition, findings indicate that smoothing by accounting changes is associated with the impact of the accoutning change on the level of earnings. This is consitent with management recognizing and making trade-offs between the effect of accounting choices on both levels and income variability. Koch (1981) also points out this trade-off by the use of a laboratory experiment.

Kamin and Ronen (1978), Kock (1981) also found that management-controlled firms are more likely to be engaged in smoothing than owner-controlled firms.

Lambert (1984) and Suh (1990) use agency theory in order to describe the principal and the manager as rational parties. They conclude that income smoothing could arise as an optimal equilibrium behavior under different conditions.

The "positive accounting theory" helps to understand the behavior income smoothing behavior. In France, bond convenants do not exist and therefore, this hypothesis cannot held in this context. Furthermore, as French firms are very reluctant to give information about managers compensation

schemes, it would be very difficult to relate income smoothing with manager's bonus scheme. Our purpose is to associate income smoothing with economic variables. Multivariate regression analysis using probit or logit models will be used to test the following determinants of income smoothing :

H4 : Ceteris paribus, the variability of earnings is less important in large firms than in small firms.

Large fluctuations may attract the attention of regulators. The firm's size is used as a proxy of political costs : the larger the firm, the more the firm is in the public eyes.

H5 : Ceteris paribus, management-controlled firms are more likely to be engaged in smoothing than owner-controlled firms.

In owner-controlled firms, the manager has almost the same interest as owners. Therefore, his compensation scheme does not need to motive him to behave in the shareholders' interest. In management-controlled firms, the manager controls the information : it is likely that the manager in this firm will manipulate the accounting information in order to smooth his own compensation. Furthermore, management-controlled firms are the more often listed on the Stock exchange and this is another contraint for the manager. If he does not behave in the interest of the sharehoders, he could lose his job and he would be badly evaluate in the job's market.

H6 : Ceteris paribus, firms with high leverage are more likely to be engaged in smoothing than firms with low leverage.

Firms which exhibit stable earnings are more likely to obtain credits from banks than firms with variable earnings.

As in the United States, we expect that large firms, manager controlled firms, high leverage firms have a less variability of their earnings with a postive effect on their value.

Conclusion

The purpose of this study is to develop a better understanding of income smoothing. By using a sample of French firms, we have shown that French firms behave as if they manipulate accounting devices in order to report stable earnings. We propose different explanations for this behavior.

Currently, I am just beginning my reflexion about explanations of income smoothing. I will propose you new hypotheses at the Colloquim in Venise in order to dicuss them.

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