



Earnings Management and Industry Classification in Brazil: an Exploratory Investigation

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Abstract

Enron and Worldcom accounting scandals brought new attention over the quality of financial accounting reports produced by listed corporations. Earnings management has generally been considered as the main cause of the alleged decrease in earnings relevance over the last decades (Lev, 1989). Following this line of inquiry this paper investigates earnings management activities of Brazilian firms. Prior research suggests that industrial organization can play a relevant role in motivating earnings management practices. To take this effect into account we control for industry classification using Economática's 20 sector definition excluding financial services, banks, insurance, and agribusiness. Our earnings management metric is based on the Kang and Sivaramakrishnan (1995) model. Results are only statistically significant for four sectors suggesting that industry classification does not explain the variance in earnings management activities for the selected sample. This output is not consistent with the stated hypothesis. Our findings contribute to the recent debate among practitioners, regulators and academics about the determinants of earnings management practices and accounting quality.

1. Introduction and Motivation

Healey and Whalen (1998) define that earnings management

occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about underlying economic performance of the company, or to influence contractual outcomes that depend on reported accounting numbers.

Numerous academic studies in earnings management such as Healy and Whalen (1998), Palepu *et al* (2004), Jones (1991) and Kang and Sivaramakrishnan (1995) investigated where and how results are managed as well as how much of the total accrual consisted of discretionary accruals. This last perception is important since the discretionary accrual corresponds to the part of the accruals manipulated by managers.

Most authors like Schipper (1989), Dechow & Skinner (2000), have shown that earnings management can be detected on some specific accounts, however the models are usually limited to a small number of accounts. Despite these limitations, some models were elaborated which provide integrated results, using econometric models to test them and have been broadly used.

On the other hand, according to Palepu *et al* (2004), Porter and McGahan (1997) and Ghemawat (2002) firms returns are explained by the industry factor, in other words,

each firm's profitability is limited by factors that influence the returns in their business area. These considerations may lead to believe that differences in industry profitability are due to each sector having a different degree of earnings management.

Cash accounting is believed to offers fewer opportunities to manipulation and the "cash flow statement provides a reconciliation of its performance based on accrual accounting and cash accounting and provides an alternative benchmark of its performance" (PALEPU, 2004, p.3-11). Therefore investors and analysts normally try to look for clues in the cash flow statement of whether the accrual accounts are manipulated or not.

Nevertheless, cash accounting is limited and for accounting to proper capture the underlying business reality (PALEPU, 2004) and for the investor to obtain a true and fair view of this reality accruals have to be produced. Opportunities for manipulation therefore, will appear and the investor needs to fulfill their information needs, that a change in the underlying business reality is accompanied by a proportional change in the accruals. Earnings management theory however, tries to analyze when and how managers will influence this change in the accruals to be different from the underlying change in business reality.

This study, in addition to contributing to these subjects, aims to join two human knowledge areas, accounting and strategy. Since it looks at industries' profitability it deals with strategy, and because it makes an analysis of the accounting information taken from the industries it also relates to accounting. As stated previously, if the results are managed, i.e. if there is earnings management, the industry profitability may not be reliable.

Gluck (1986, p.16) raised the question of "why are some firms competing in the same industry persistently more profitable?", again, earnings management may be part of the answer. In this context, corporate governance is an attempt to minimize or avoid manipulation. This paper however is not going to shed any light over the corporate governance issue since it focuses on the industry level of earnings management and corporate governance is mostly firm specific.

This paper intends to discuss the level of earnings management in Brazilian industries and if the industry factor has significant explanation power over this level. Palepu *et al* (2004, p.4-5) reported that "financial statements sometimes do a poor job of reflecting the firm's economic[...]" revealing an increasing concern about the discrepancy between the reported results and the business reality. According to Lopes (2002, p. 7) in Brazil this problem is expected to be intensified since "accounting information is expected to be of low quality due to both the conditions in the profession and the capital markets structure".

2. Related Research and Hypothesis Development

The initial view of earnings management is that the firm's accruals are manipulated to meet a certain pre-established value. According to Degeorge *et al* (1999), under the managers' perspective there are three main incentives to manage results:

- 1) To report profits closer to the analysts' forecasts of earnings per share value;
- 2) To sustain recent performance or smooth results;
- 3) To report positive profits.

In addition there are regulatory motivations, i.e. earnings management to reduce the chance of intervention and investigation or for tax planning purposes (HEALY AND WAHLEN, 1998) and personal motivations such as increase personal bonuses (MARTINEZ, 2001).

On the other hand, regulations can force managers' to increase or decrease the level of earnings management to meet the legal obligations suggesting that regulatory considerations induce firms to manage earnings (HEALY AND WAHLEN, 1998).

Very few earnings management studies deal with Brazilian firms and capital markets in Brazil with exceptions such as Martinez (2001) and Tukamoto (2002). In opposition internationally many studies such as Healy and Wahlen (1998) discussed types of earnings management, what incentive do managers have to manipulate, whether there is a correlation between earnings management and stock return and what specific accruals are commonly managed.

When argue about the stock return, earnings management can be an attempt to influence short-term stock price performance, misleading stakeholders or part of them. This is not correct because on the long-term the real value will appear.

According to Healy and Wahlen (1998, p.16) "several other studies have investigated market reactions when earnings management is alleged or detected". Those reactions could be associated with the distortion of financial accounting data which decreases its value to investors (PALEPU *et al*, 2004).

According to Schmalensee (1985, p.349) "the finding that industry effects are important supports the classical focus on industry-level". To explain the industry profitability Palepu (2004) has adapted Porter's five forces model as shown on the following figure 1:

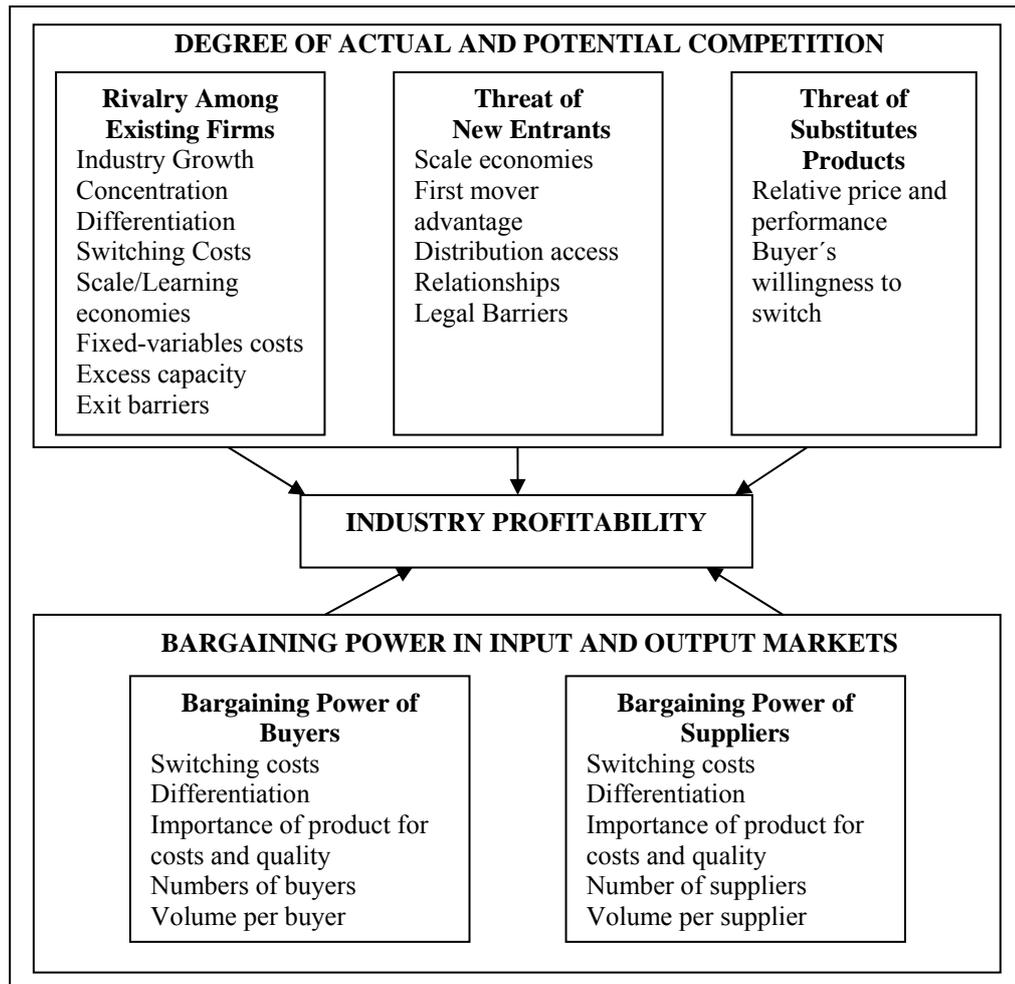


Figure 1 – Industry Structure and Profitability

A sum of these forces is according to Palepu (2004) and Porter (1997):

Competitive Force 1: Rivalry Among Existing Firms

In most industries the rivalry among existing firms dictates the average level of profitability. In some cases the firms competing below the marginal cost to gain market-share. Some factors are linked with this force like industry growth rates, concentration and balance competitors, degree of differentiation and switching costs, scale/learning economies and the ratio of fixed to variable costs, excess capacity and exit barriers.

Competitive Force 2: Threat of New Entrants

This force change when an industry turns attractiveness. Normally the pricing constrained of the existing firms. The basics factors to influence this force are Economies of scale, first mover advantage, access to channels of distribution and relationships and legal barriers.

Competitive Force 3: Threat of Substitute products

This force changes the competition among firms when emerge a new product or service affecting firms as a whole, the price and the bargaining power with its suppliers and customers.

Competitive Force 4: Bargaining Power of Buyers

Two principals' factors determine the power of buyers: price sensitivity and relative bargaining power. If buyers have bargaining power, they can forcing price down.

Competitive Force 5: Bargaining Power of Suppliers

Inside the industry if there is a few powerful suppliers, they can "define" or "decide" the price of them products or service and the firms cannot pass on to yours clients, needing to accept this situation and reduce firms' profitability.

Our research in the Brazilian capital market follows this background and intends to explore the relevance of the industry factor when detecting the presence of earnings management. The null hypothesis of our regression is:

H₀: The industry (sector) is an important explanatory factor in detecting earnings management

As mentioned by Beneish (2001), in the context of financial institutions and insurance companies, certain industries provide more incentive to manipulate than others because according to Healy and Wahlen (1998, p. 13) "loan loss reserves for banks and property casualty claim loss reserves are highly dependent on management's judgment, are directly related to heir most critical assets and liabilities [...]".

According to Beneish (2001, p. 5), "much of the evidence of earnings management is dependent on firm performance, suggesting that earnings management is more likely to be present when a firm's performance is either unusually good or unusually bad."

Our paper expands this conception to a general context of several industries related on the Economatica's database and investigates minutely which of them may have atypical incentives or lack of incentives to earnings management. These practices contributes to increase informational asymmetry.

The corporate governance normally intends that its effects reduce the informational asymmetry because reduce the opportunities that manager can be to manipulate the results.

3. The Model

Several econometric models are used to test for the occurrence of earnings management. Each of these models differ in aspects such as the accounts used as explanatory variables and the estimation procedure.

The Jones modified model (1991) is the most widely used because of its simplicity, but Kang and Sivaramakrishnan (1995) (hereafter KS) developed a new and supposedly more efficient model. One critique of the ones model is that since the independent variables are accounting numbers there will be correlation between the errors (Discretionary Accruals) and the regressors if earnings are managed; causing the OLS estimates to be inconsistent and biased. To account for this problem KS uses the Instrumental Variable method.

Furthermore, according to Schmalensee (1985, p. 343) "the link between the real economic profitability dealt with in theoretical discussions and the accounting returns used in empirical work is weakened by inflation". In this sense, Martinez (2001) draws

attention to another advantage of the KS model which resides in the fact that it works with absolute year results (e.g. revenue in year t) instead of the yearly variation used by Jones (e.g. $\Delta\text{Revenue}_t$ divided by total assets_{t-1}) and this way nearly eliminates the effect of the inflation factor.

Finally KS work exclusively with accounting numbers and use more accounts than Jones Modified Model. The results, therefore, are more robust and precise.

The KS Model (1995) is:

$$AB_{i,t} = \phi_0 + \phi_1 [\delta_{1,i} REV_{i,t}] + \phi_2 [\delta_{2,i} EXP_{i,t}] + \phi_3 [\delta_{3,i} GPPE_{i,t}] + \beta PART_{i,t} + \varepsilon_{i,t}$$

Where:

$AB_{i,t}$ = accrual balance

$$= AR_{i,t} + INV_{i,t} + OCA_{i,t} - CL_{i,t} - DEP_{i,t}^*$$

$A_{i,t}$ = accruals

$$= \Delta AR_{i,t} + \Delta INV_{i,t} + \Delta OCA_{i,t} - \Delta CL_{i,t} - \Delta DEP_{i,t}^*$$

$AR_{i,t}$ = receivables, excluding tax refunds

$INV_{i,t}$ = inventory

$OCA_{i,t}$ = other current assets than cash, receivables, and inventory

$CL_{i,t}$ = current liabilities excluding taxes and current maturities of long-term debt

$DEP_{i,t}$ = depreciation and amortization

$REV_{i,t}$ = net sales revenues

$EXP_{i,t}$ = operating expenses (cost of goods sold, selling and administrative expenses

before depreciation

$GPPE_{i,t}$ = gross property plant and equipment

$NTA_{i,t}$ = net total assets

$$\delta_{1,i} = AR_{i,t-1} / REV_{i,t-1}$$

$$\delta_{2,i} = NV_{i,t-1} + OCA_{i,t-1} - CL_{i,t-1} / EXP_{i,t-1}$$

$$\delta_{3,i} = DEP_{i,t-1} / GPPE_{i,t-1}$$

This model utilizes balance sheet accounts, current and non-current, to isolate the part of discretionary accruals consisting of the residuals (errors) of the regression above stated.

Before the model was used some adaptation to Brazilian accounting proved necessary. Some accounts used in the model had to be adjusted due to the non existence of a perfectly correspondent account to be used as the variables $GPPE$, EXP , OCA and CL in Brazilian financial reports.

In fact, other limitations emerged when defining the period and accounts. When the number of years was extended, the sample size reduced automatically making it difficult to obtain more information since there was no data available for extended periods for several companies.

To account for the industry factor n-1 (where n is the number of industries) dummy variables were included; one for each sector except one. The dummy equals one when the company is of the sector described by it and 0 otherwise.

We can rewrite the model putting the dummy variable to separate each industry, where:

$$AB_{i,t} = \phi_0 + \phi_1 [\delta_{1,i} REV_{i,t}] + \phi_2 [\delta_{2,i} EXP_{i,t}] + \phi_3 [\delta_{3,i} GPPE_{i,t}] + \text{Dummy} + \varepsilon_{i,t}$$

Our expectation is that the inclusion of these dummy variables will reveal the explanation power of the industry factor over the regression.

4. Sample Selection and Results

The sample on this paper was taken from Economatica and consists of 156 organisations from showing 448 observations excluding the financial industry including financial services, banks and insurance because of the specificity of the sector and the agribusiness sector due to the shortage of available data for it.

The regression utilized the data from the period between and including 2000 and 2003. The data is also discriminated by year and industry.

To account for the industry factor n-1 (where n is the number of industries) dummy variables were included; one for each sector except one. The dummy equals one when the company is of the sector described by it and 0 otherwise.

Table 1 – The Regression Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
REV	0.094108	0.038621	2.436691	0.0152
EXP	0.130923	0.014295	9.158530	0.0000
GPPE	-0.312912	0.145665	-2.148162	0.0323
Food	-0.023417	0.021175	-1.105925	0.2694
Commerce	-0.057216	0.026332	-2.172856	0.0303
Building Companies	0.021470	0.023729	0.904797	0.3661
Electronics	-0.078127	0.026121	-2.990937	0.0029
Electricity	-0.004343	0.015225	-0.285241	0.7756
Machines	0.007273	0.045206	0.160887	0.8723
Mining	0.000793	0.037074	0.021386	0.9829
nonmetallic minerals	-0.042894	0.028523	-1.503829	0.1334
cellulose	-0.035016	0.029392	-1.191333	0.2342
Oil and Gas	-0.032623	0.033591	-0.971198	0.3320
Chemistry	-0.010856	0.018320	-0.592601	0.5538
Siderurgy and metallurgy	-0.008952	0.015883	-0.563631	0.5733
Telecommunication	-0.078985	0.024916	-3.170010	0.0016
Textile	-0.052786	0.020269	-2.604261	0.0095
Transport	-0.039850	0.031926	-1.248182	0.2126

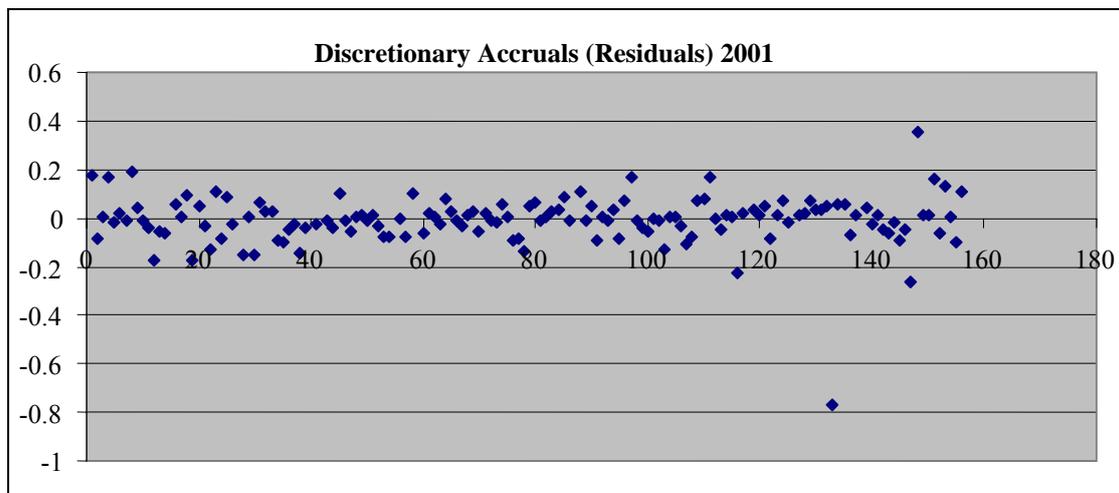
The results presented in table 1 show that only in Commerce, Electronics, Telecommunications and Textiles sectors detected earnings management based 95% significance level.

Table 2 shows our results and Coefficients:

R-squared	0.252851	Mean dependent var	0.033744
Adjusted R-squared	0.223313	S.D. dependent var	0.123267
S.E. of regression	0.108635	Akaike info criterion	1.562302
Sum squared resid	5.074647	Schwarz criterion	1.397377
Log likelihood	367.9557	F-statistic	8.560081
Durbin-Watson stat	2.006679	Prob(F-statistic)	0.000000

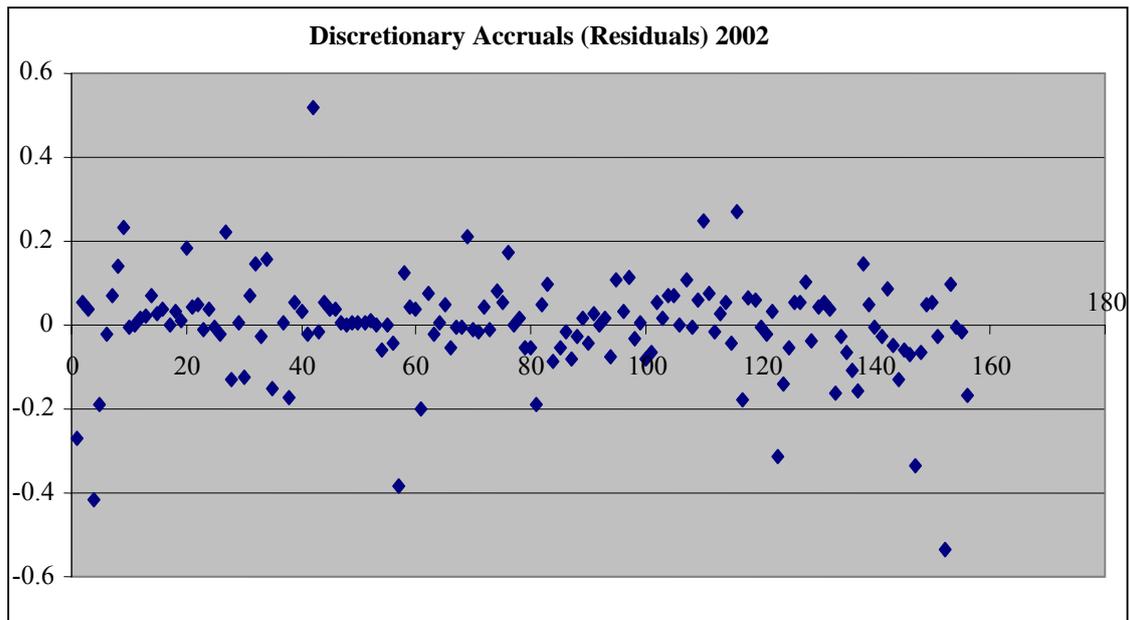
The R-squared shows a relevant explanation power of the independent variables. According to the results 25.3% of the dependent variable is explained by the explanatory variables. However, the t-statistic test on each of the dummy variables tell us only four of them (Commerce, Electronics, Telecommunications and Textiles) are statistically significant.

There is no reason to suspect the presence of heteroskedasticity or autocorrelation of residuals as the following graphs of the estimated residuals suggest.

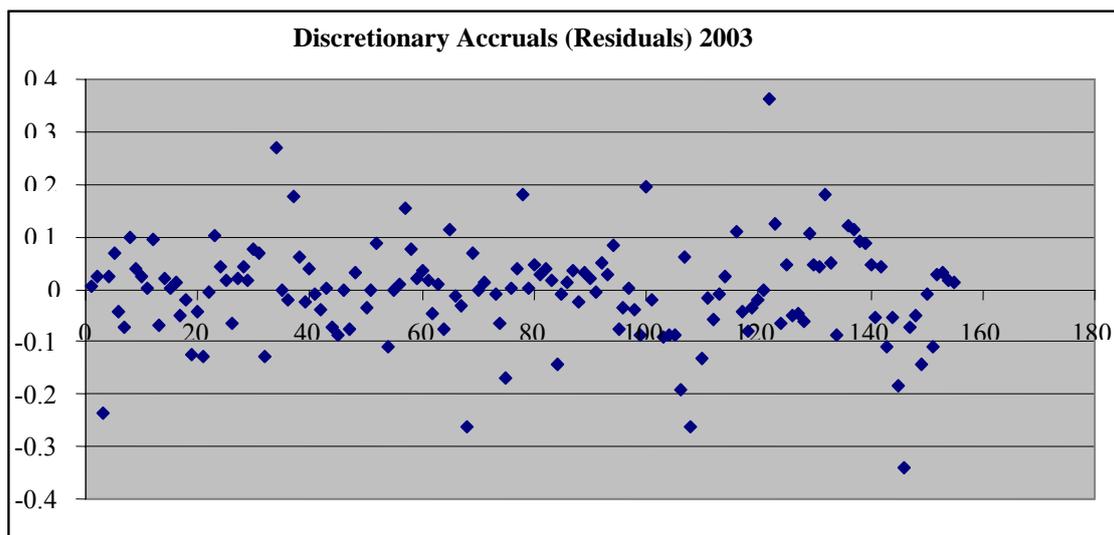


Graphic 1 – Discretionary Accruals 2001

The discretionary accrual on 2001 is more concentrated of that the others years, maybe have some particularity or for being the first year of the test some effects of the model force to this.



Graphic 2 – Discretionary Accruals 2002



Graphic 3 – Discretionary Accruals 2003

In each year the residuals seem fairly distributed around a mean of zero. However, it appears to be a tendency towards a greater dispersion around the mean on later years. It is easy to see how in 2003 it is easier to find residuals further from the 0 axis than in 2002 and even more in 2001.

5. Conclusions and Implications for Future Research

In contrast with idea initiated by Beneish (2001) our regression results do not allow us to confirm the null hypothesis and lead to discard the industry factor as an explanatory variable in earnings management research.

These findings contribute mainly in the debate about the determinants of earnings management practices indicating regulatory incentives to manipulate, which are the most apparent differences between industries, play a lesser role for managers when balancing the pros and cons of manipulating their results.

Further research should focus on other external determinants of earnings management and intensify the search for forms of including incentives which come from outside the company in the calculation of the discretionary accruals.

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