

# Lazy Prices\*

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# Lazy Prices

## ABSTRACT

We explore the implications of a subtle “default” choice that firms make in their regular reporting practices, namely that firms typically repeat what they most recently reported. Using the complete history of regular quarterly and annual filings by U.S. corporations from 1995-2014, we show that when firms make an active change in their reporting practices, this conveys an important signal about the firm. Changes to the language and construction of financial reports have strong implications for firms’ future returns: a portfolio that shorts “changers” and buys “non-changers” earns up to 188 basis points per month (over 22% per year) in abnormal returns in the future. These reporting changes are concentrated in the management discussion (MD&A) section. Changes in language referring to the executive (CEO and CFO) team, or regarding litigation, are especially informative for future returns.

JEL Classification: G12, G14, G02

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All agents face repetitive tasks. This includes financial agents. CEOs, CFOs, accountants, and treasurers alike face the decision of how to deal with these repetitive tasks. One response is to codify rules that lower the cost of performing these tasks. For instance, form e-mails, saved user information, and automatic-payment plans are examples of responses to repetitive tasks. And while there are efficiency arguments for codifying repetitive tasks, what this means observably is that it can take a large perturbation to call agents into action (and out of inaction) in order to “break” the rules designed to perform these repetitive tasks. While most studies have focused on the effects this will have on inertia, and try to measure that inertia, here we do the opposite. Specifically, we examine situations where agents actively intervene, break inertia, and fail to take the path of least resistance; and then analyze the information content of these actions.

We focus on the behavior of corporations, and show that when firms break from former language or well-codified text in their annual and quarterly reports, that there is a substantial amount of information embedded in this action for important future firm outcomes.

Our approach is grounded in a long line of research in psychology and behavioral economics that stresses the importance of “default” choices. A default typically refers to a baseline choice, setting, or policy that is pre-selected. Defaults generally take effect when an agent fails to make an active choice, fails to update his selection, or fails to “opt out” of a given baseline selection. Defaults can be critical because of a combination of behavioral and situational factors, most notably inertia. Inertia in decision-making has been demonstrated in many settings, and can be especially prevalent when an agent is faced with complex tasks.

In response to a growing body of evidence on the widespread nature and potentially problematic implications of inertial behavior, many interventions focusing on “smart defaults” have been implemented. For example, in areas ranging from lab experiments, to organ donation settings on drivers’ licenses, to 401k retirement plan menu choices, the use of carefully constructed defaults designed to offer agents and social planners a more “desirable” set of outcomes in the event that all agents are inert—i.e., fail to make active choices--has become increasingly popular.

In this paper we explore the implications of default choices in an entirely non-experimental setting, by analyzing the behavior of corporations. We focus specifically on a setting where defaults appear to be commonly used by firms, namely in their reporting decisions. We show that the particular construction of firms’ annual and quarterly reports suggests that firms are using simple default choices, the most obvious of which is simply repeating the information that they previously reported to the markets.

Consistent with the experimental evidence on the importance of active choices, we show that when firms do make an active decision to significantly change the wording and language choices embedded in their quarterly and annual reports, that these active changes have large but subtle implications for future firm behavior, and future firm outcomes.

A simple example helps to clarify our approach. Consider the case of Schweitzer-Mauduit International, Inc. (commonly referred to as “SWM”), a diversified producer of premium specialty papers, and the world’s largest supplier of cigarette paper to the tobacco industry. Historically SWM’s annual reports (10-Ks) were very similar across time, when measured using a variety of textual analytics. Figure 1, however, shows that

something changed in 2005. A closer look at their 2005 10-K, released in March of 2005, reveals some notable additions to their standard overview and outlook portion of the management and discussion (MD&A) section (depicted in Figure 2). In particular, SWM added a series of *new paragraphs* in this section, cautioning about weakness in their European market:

“...caused by increased cigarette prices, health concerns and public perceptions. As well, cigarette consumption has declined in France and Germany following recent tax increases on cigarette sales in those countries.

We are experiencing weakness in our tobacco-related paper sales in western Europe caused by reduced cigarette consumption in several large European markets and new cigarette paper manufacturing capacity that was added in western Europe in mid-2004. This is expected to result in increased cigarette paper machine downtime in France in 2005.”

Table 1 shows SWM’s 2004 10-K side-by-side with their 2005 10-K; one can see the remarkable consistency across the two years, except for the new paragraphs added in 2005.

Then in May of 2005, in their quarterly 10-Q report, the firm shed additional light on the weakness in their European market, with another set of *additional* paragraphs (relative to their year-over-year seasonally analogous 10-Q in May of 2004):

“Unit sales volumes declined by 6 percent compared with last year, having an unfavorable \$5.7 million, or 4 percent, impact on the net sales comparison.

Sales volumes of the French segment declined 12 percent year-over-year, primarily as a result of lower sales of RTL products. The decline in RTL sales volumes was

caused by differences in the timing of customer orders. First quarter of 2004 volumes included, in-part, a restocking of customer RTL inventories following start-up of new RTL production capacity at the end of 2003.

French segment net sales declined \$2.7 million, or 3 percent, from 2004 to 2005. The decline in sales volumes, in large part due to lower sales of RTL products, provided the majority of this decline.”

Figure 2 depicts the future stock returns of SWM, starting at the beginning of 2005 and continuing out over the next 18 months. As Figure 2 shows, SWM’s stock returns declined dramatically (more than -40%) over the 3- to 6-month period following the release of their 10-K, and did not revert over the following year.

We demonstrate that this pattern of behavior and subsequent events is systematic across the entire cross-section of U.S. publicly traded firms from 1995 to 2014. First we show that firms rarely make substantive changes to the language and construction of their reports. Employing a variety of textual analysis approaches, we demonstrate that only a small percentage of firms make large changes to their reports on a quarterly or annual basis.

Next we explore the implications of these active changes. We show that firms that change their reports in a significant fashion are associated with lower future returns. In particular, a portfolio that goes long “non-changers” and short “changers” earns a statistically significant 30-60 basis points per month – up to 7.6% per year ( $t=4.44$ ) - in abnormal returns over the following year. These returns continue to accrue out to 18 months, and do not reverse, implying that far from overreaction, these changes imply true, fundamental information for firms that only gets gradually incorporated into asset

prices over the following 12-18 months after the reporting change.

We show that these findings cannot be explained by traditional risk factors, well-known predictors of future returns, unexpected earnings surprises, or news releases that coincide with the timing of these firm disclosures.

We also explore the mechanism at work behind these return results. We show that firms' reporting changes are concentrated in the management discussion (MD&A) section, which is the section of the reports where management has the most discretion and flexibility in terms of content. However, in terms of return-rich content, we find that while changes in MD&A section wording do predict large and significant abnormal returns, changes in text in the Risk Factors section are even more informative. For instance, the 5-factor alpha on (Non-Changers – Changers) particularly in this section is over 188 basis points per month ( $t=2.76$ ), or over 22% per year. Further, we find that changes in language referring to the executive (CEO and CFO) team, and about litigation and lawsuits, are especially informative for future returns, as is the increased usage of so-called “negative sentiment” words. For instance, changes focused on litigation and lawsuits underperform the non-changers by over 71 basis points per month, or over 8.5% per year ( $t=3.29$ ).

The remainder of the paper is organized as follows. Section I provides a brief background and literature review. Section II describes the data we use, while Sections III explores the particular construction of firms' annual and quarterly reports. Section IV examines the impact of these choices, and Section V explores the mechanism driving our results in more detail. Section VI concludes.

## I. Background and Related Literature

Our paper adds to a growing literature examining the information content of firms' disclosure choices. Initially several papers focused on hand-coded analysis of disclosure content, for example in the management discussion (MD&A) section of annual reports (see Bryan (1997), and Rogers and Grant (1997)). Others used survey rankings in order to quantify the level of disclosure (see Clarkson, Kao, and Richardson (1999), Barron, Kile, and O'Keefe (1999)) in the MD&A sections.<sup>1</sup>

More recently, as a result of increased computing power and advances in the field of natural language processing, the focus has shifted to more automated forms of textual analysis. For example, Li (2008) employs a form of textual analysis and finds that the annual reports of firms with lower earnings (as well as those with positive but less persistent earnings) are harder to interpret. Li (2010) also finds that firms' tone in forward-looking statements in the MD&A section can be used to predict future earnings surprises. Meanwhile Nelson and Pritchard (2007) explore the use of cautionary language designed to invoke the safe harbor provision under the Private Securities Litigation Reform Act of 1995, and find that firms that are subject to greater litigation risk change their cautionary language to a larger degree relative to the previous year; but after a decrease in litigation risk, they fail to remove the previous cautionary language. Meanwhile Feldman et al. (2010) find that a positive tone in the MD&A section is associated with higher contemporaneous and future returns, and that an increasingly negative tone is associated with lower contemporaneous returns.<sup>2</sup> Closest to our paper is perhaps Brown and Tucker (2011), who focus on year-on-year changes (as opposed to

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<sup>1</sup> See Cole and Jones (2005) and Feldman et al. (2010) for a survey of the evidence.

<sup>2</sup> See also Muslu et al. (2009); and Li (2011) for a survey of various textual analysis approaches.



levels) in the text of the MD&A section, and find that changes in the MD&A section are related to future operating changes in the business (e.g., accounting-based measures of performance, as well as liquidity measures); they also find that contemporaneous returns around 10-K filing dates are increasing in changes to MD&A. Our paper is unique in that we explore a simple set of measures that capture firm-level changes in reporting behavior across the entire 10-K and 10-Q, not just the MD&A sections; and more importantly we explore the impact of these changes on *future* stock returns and *future* litigation events, rather than past or contemporaneous events.

## II. Data and Summary Statistics

We draw from a variety of data sources to construct the sample we use in this paper. We download all complete 10-K, 10-K405, 10-KSB and 10-Q filings from the SEC’s Electronic Data Gathering, Analysis, and Retrieval (EDGAR) website<sup>3</sup> from 1994 to 2014. All complete 10-K and 10-Q filings are in HTML text format and contain an aggregation of all information that are submitted with each firm’s file, such as exhibits, graphics, XBRL files, PDF files, and Excel files. Similar to Loughran and McDonald (2011), we concentrate our analysis on the textual content of the document. We only extract the main 10-K and 10-Q texts in each document and remove all tables (if their numeric character content is greater than 15%), HTML tags, XBRL tables, exhibits, ASCII-encoded PDFs, graphics, XLS, and other binary files.<sup>4</sup>

We obtain monthly stock returns from the Center for Research in Security Prices

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<sup>3</sup> (<https://www.sec.gov/edgar/>)

<sup>4</sup> Bill McDonald provides a very detailed description on how to strip 10-K/Q down to text files: [http://www3.nd.edu/~mcdonald/Word\\_Lists\\_files/Documentation/provides](http://www3.nd.edu/~mcdonald/Word_Lists_files/Documentation/provides)

(CRSP) and firms' book value of equity and earning per share from Compustat. We obtain analyst data from the Institutional Brokers Estimate System (IBES). We obtain sentiment category identifiers from Loughran and McDonald (2011)'s Master Dictionary.<sup>5</sup>

We measure the quarter-on-quarter similarities between 10-Q and 10-K filings using four different similarity measures: cosine similarity, Jaccard similarity, minimum edit distance, and simple similarity. The first measure is called the cosine similarity between two documents  $D_1$  and  $D_2$  and is computed as follow. Let  $D_{S1}$  and  $D_{S2}$  be the set of terms occurring in  $D_1$  and  $D_2$ , respectively. Define  $T$  as the union of  $D_{S1}$  and  $D_{S2}$ , and let  $t_i$  be the  $i^{th}$  element of  $T$ . Define the term frequency vectors of  $D_1$  and  $D_2$  as:

$$\begin{aligned} D_1^{TF} &= [nD_1(t_1), nD_1(t_2), \dots, nD_1(t_N)] \\ D_2^{TF} &= [nD_2(t_1), nD_2(t_2), \dots, nD_2(t_N)] \end{aligned}$$

where  $nD_1(t_i)$  is the number of occurrences of term  $t_i$  in  $D_1$  and  $nD_2(t_i)$  is the number of occurrences of term  $t_i$  in  $D_2$ . The cosine similarity between two documents is defined as:

$$Sim\_Cosine = D_1^{TF} * D_2^{TF} / ||D_1^{TF}||_x ||D_2^{TF}||$$

where the dot product,  $*$ , is the scalar product and norm,  $|| \cdot ||$ , is the Euclidean norm. For a textual and numerical example, consider these three short texts:

$D_A$ : We expect demand to increase.

$D_B$ : We expect worldwide demand to increase.

$D_C$ : We expect weakness in sales.

It is easy to see that  $D_A$  is very similar to  $D_B$  and that  $D_A$  is more similar to  $D_B$  than it is to  $D_C$ . The cosine similarity of  $D_A$  and  $D_B$  is computed as follow. First, the union  $T(D_A, D_B)$  is:

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<sup>5</sup> [http://www3.nd.edu/~mcdonald/Word\\_Lists.html](http://www3.nd.edu/~mcdonald/Word_Lists.html)

$$T(D_A, D_B) = [\text{we, expect, worldwide, demand, to, increase}]$$

The term frequency vectors of  $D_1$  and  $D_2$  are:

$$\begin{aligned} D_A^{TF} &= [1, 1, 0, 1, 1, 1] \\ D_B^{TF} &= [1, 1, 1, 1, 1, 1] \end{aligned}$$

The cosine similarity score of  $D_A$  and  $D_B$  is therefore:

$$\begin{aligned} \text{Sim\_Cosine}(D_A, D_B) &= D_A^{TF} * D_B^{TF} / ||D_A^{TF}||_x ||D_B^{TF}|| \\ &= (1 \times 1 + 1 \times 1 + 0 \times 1 + 1 \times 1 + 1 \times 1 + 1 \times 1) \\ &\quad [\sqrt{1^2 + 1^2 + 1^2 + 1^2 + 1^2}]_x [\sqrt{1^2 + 1^2 + 1^2 + 1^2 + 1^2 + 1^2}] \\ &= 0.91 \end{aligned}$$

Similarly, the cosine similarity of  $D_A$  and  $D_C$  is computed as follow. The union  $T(D_A, D_C)$  of  $D_A$  and  $D_C$  is:

$$T(D_A, D_C) = [\text{we, expect, demand, to, increase, weakness, in, sales}]$$

The term frequency vectors of  $D_A$  and  $D_C$ :

$$\begin{aligned} D_A^{TF} &= [1, 1, 1, 1, 1, 0, 0, 0] \\ D_C^{TF} &= [1, 1, 0, 0, 0, 1, 1, 1] \end{aligned}$$

The cosine similarity score of  $D_A$  and  $D_C$  is therefore:

$$\begin{aligned} \text{Sim\_Cosine}(D_A, D_C) &= D_A^{TF} * D_C^{TF} / ||D_A^{TF}||_x ||D_C^{TF}|| \\ &= (1 \times 1 + 1 \times 1 + 1 \times 0 + 1 \times 0 + 1 \times 0 + 0 \times 1 + 0 \times 1 + 0 \times 1) \\ &\quad [\sqrt{1^2 + 1^2 + 1^2 + 1^2 + 1^2}]_x [\sqrt{1^2 + 1^2 + 1^2 + 1^2 + 1^2}] \\ &= 0.40 \end{aligned}$$

Clearly,  $D_A$  is more similar to  $D_B$  than to  $D_C$  and the cosine similarity measures captures

this difference in similarity.

The Jaccard similarity measure uses the same term frequency vectors/sets as in the cosine similarity measure, and is defined as:

$$Sim\_Jaccard = |D_1^{TF} \cap D_2^{TF}| / |D_1^{TF} \cup D_2^{TF}|$$

In other words, the Jaccard similarity is the size of the intersection divided by the size of the union of the two term frequency sets. In the same textual examples  $D_A$ ,  $D_B$ , and  $D_C$  as above, the Jaccard similarities are:

$$\begin{aligned} Sim\_Jaccard(D_A, D_B) &= |\{\text{we, expect, demand, to, increase}\}| / \\ &\quad |\{\text{we, expect, worldwide, demand, to, increase}\}| \\ &= 5 / 6 = 0.83 \end{aligned}$$

$$\begin{aligned} Sim\_Jaccard(D_A, D_C) &= |\{\text{we, expect}\}| / \\ &\quad |\{\text{we, expect, demand, to, increase, weakness, in, sales}\}| \\ &= 2 / 8 = 0.25 \end{aligned}$$

The third similarity measure we employ is called *Sim\_MinEdit* (also known as *Sim\_String*) and is computed by counting the smallest number of operations required to transform one document into the other. In the same textual examples  $D_A$ ,  $D_B$ , and  $D_C$  as above, transforming  $D_A$  to  $D_B$  only requires adding the word “*worldwide*”, while transforming  $D_A$  to  $D_C$  requires deleting 3 words “*demand*”, “*to*”, and “*increase*” and adding 3 words “*weakness*”, “*in*”, “*sales*”.

Finally, the fourth similarity measure we use is called *Sim\_Simple*, and uses a simple side-by-side comparison method. We utilize the function “Track Changes” in Microsoft Words or the function “diff” in Unix/Linux terminal to compare the old

document  $D_1$  with the new document  $D_2$ . We first identify the “changes”, “additions”, and “deletions” while comparing the old document with the new document. We next count the number of words in those changes, additions, and deletions and normalized the total count by the size of old document  $D_1$ .

In a sense, this fourth method is the closest to how a human being performs a comparison of two documents. An example is shown below in Figure 4: the document on the left is the *old* document and the document on the right is the *new* document. The highlighted text on the right is the new addition. In this example, the method counts the number of words in the highlighted new addition and divides by the size of the old document.

In our mechanism tests, we measure the sentiment of document changes by counting the number of positive words minus the number of negative words in the changes between the old document and the new document, normalized by the size of the changes. We further compute the uncertainty and litigious nature of the change by counting the number of words categorized as uncertainty and litigious, respectively, normalized by the size of the changes. Sentiment category identifiers (e.g., negative, positive, uncertainty, litigious) are taken from Loughran and McDonald (2011)’s Master Dictionary.

We parse 10-K/Q documents for mentioning of CEO or CFO turnover and define two indicator variables Change CEO and Change CFO that take the value of 1 if the 10-K/Q documents mention a change in CEO or CFO.

Lastly, we obtain firms’ auditor information from AuditAnalytics. However, AuditAnalytics only covers approximately one third of CRSP/Compustat universe, we further collect firms’ auditor information directly from 10-K and 10-Q documents by

parsing and capturing auditor names in sections that contain the phrase or variation of the phrase “Independent Registered Public Accounting Firm.”

Table II presents summary statistics from our final dataset, which consists of all 10-Ks and 10-Qs downloaded from the SEC Edgar websites from 1995 to 2014. *Document Size* refers to the number of words in each report, and the *Size of Change* refers to the number of words that change relative to a prior report (in the case of a 10-K, the change is measured relative to last year’s 10-K, and in the case of a 10-Q, the change is measured relative to the same quarter’s 10-Q in the prior year). Table II shows that the average 10-K contains 308,633 words, while the average 10-Q contains roughly one-third as many words (111,789).

As noted above, for some of our tests of the mechanism, we also draw sentiment category identifiers and word lists (e.g., measures of negative words, positive words, uncertainty, litigiousness, etc.) from Loughran and McDonald (2011)’s Master Dictionary.<sup>6</sup> In Table II, the *Sentiment of Change* refers to the number of positive words minus the number of negative words normalized by the size of the change. The *Uncertainty of Change* and the *Litigiousness of Change* are the number of words categorized by “uncertainty” and “litigiousness,” respectively, normalized by the size of the change. Finally, *Change CEO* and *Change CFO* are indicator variables set equal to one if the 10-K or 10-Q mentions a change in CEO or change in CFO, respectively. Table II shows that CEO and CFO changes are mentioned in roughly 2-5% of the reports, on average.

Table III presents summary statistics of the four similarity measures. Each of the

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<sup>6</sup> These words are available at: ([http://www3.nd.edu/~mcdonald/Word\\_Lists.html](http://www3.nd.edu/~mcdonald/Word_Lists.html))

measures ranges from 0 to 1, but the ranges differ across the measures. For example, the distribution of the Sim\_Cosine measure is fairly narrow, with a mean of 0.86 and a standard deviation of 0.21, while the distribution of the Sim\_Simple measure is centered at a much lower level, with a mean of 0.12 and a standard deviation of 0.12. Recall that higher values indicate a higher degree of document similarity across years between the 10-Ks (or 10-Qs), while lower values indicate more changes across documents.

Panel B reports the correlations between the measures. All four measures are strongly positively correlated with each other, although the Sim\_Simple measure is correlated only 0.25 with the Sim\_Cosine measure; all of the other pairwise correlations between the four measures exceed 0.5.

### III. The Implications of Changes in Reporting Behavior

In this section we examine the implications of firms' decisions to change the language and construction of their SEC filings. Our hypothesis is that large changes in reporting, when they do occur, will have significant implications for firms' future actions and outcomes, given the tendency of firms to simply report what they previously reported (i.e., to not change their reports).

We begin by analyzing the future stock returns associated with firms who change their reports, versus those who do not. First we compute standard calendar-time portfolios, and then we control for additional determinants of returns by employing Fama-MacBeth monthly cross-sectional regressions.

#### *A. Calendar-Time Portfolio Returns*

For each of the four similarity measures described in the previous section, we

compute quintiles each month based on the prior month’s distribution of similarity scores across all stocks. For firms with a fiscal year-end in December, we use the following reports: for calendar quarter Q1, we use the release of a firm’s 10-Q, which generally occurs in April or May; for calendar quarter Q2, we use another release of a firm’s 10-Q, which generally occurs in July or August; for calendar quarter Q3, we use another release of a firm’s 10-Q, which generally occurs in October or November; and finally for the year-end results we use the release of the full-year 10-K, which typically occurs in January or February.<sup>7</sup> Similarity scores are computed relative to the prior year report that lines up in calendar time with the report in question (such that 2004 Q1 10-Qs are compared with 2005 Q1 10-Qs, for example). Stocks enter the portfolio in the month after the public release of one of their reports, which induces a lag in our portfolio construction. Firms are held in the portfolio for 3 months. Portfolios are rebalanced monthly, and the returns are reported in Table V.

Panel A of Table IV presents equal-weighted calendar-time portfolio returns. Quintile 1 (Q1) refers to firms that have the least similarity between their document this year and the one last year; hence this portfolio consists of the “big changers.” Quintile 5 (Q5) refers to firms that have the most similarity in their documents across years, and hence this portfolio represents the “little to no changers.” Q5-Q1 represents the long-short (L/S) portfolio that goes long Q5 and short Q1 each month.

Panel A shows that this L/S portfolio earns a large and significant abnormal return, ranging in magnitude between 18-46 basis points per month. This result is unaffected by

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<sup>7</sup> For firms with “off-cycle” fiscal year-ends we simply use their reports in an analogous way to that presented here, but incorporating the different timing. E.g., firms with a fiscal-year end in June typically release their annual 10-Ks in July and August; and for the other 3 calendar quarters we would analyze their 10-Qs instead.



controlling for the 3 Fama-French factors (market, size, and value), or for two additional momentum and liquidity factors. Notably, all 4 measures of similarity deliver this same finding, suggesting that our results are not driven by the particular way we compute year-over-year changes in the documents. The interpretation of this finding is that firms that make significant changes to their disclosures in a given year experience lower future returns. Later in the paper we explore the possible mechanisms behind this return result.

Panel B of Table IV then presents value-weight portfolio returns, computed as in Panel A except that each stock in the portfolio is weighted by its (lagged) market capitalization. Panel B shows that the value-weight portfolio returns are similar but somewhat larger in magnitude to the equal-weight results, with the value-weight L/S portfolio earning up to 63 basis points per month ( $t=4.45$ ), depending on the similarity measure employed.

Panel B of Table IV also shows that the majority of the L/S spread comes from the short side of the portfolio. For example, using the Jaccard similarity measure, the Q1 short portfolio earns -44 basis points per month ( $t=4.56$ ), while the Q5 long portfolio earns only +19 basis points ( $t=1.87$ ).

### *B. Fama-MacBeth Regressions*

Next we run monthly Fama-MacBeth cross-sectional regressions of individual firm-level stock returns on a host of known return predictors, plus our 4 similarity measures. As Table V shows, each similarity measure is a positive and significant predictor of future returns, implying that firms who make large changes to their reports experience lower future returns. This result holds when we include a variety of additional return

predictors as well, such as last month’s (or last quarter’s) standardized unexpected earnings surprise (SUE). SUE is computed as actual earnings per share minus average analyst forecast earnings per share, divided by the standard deviation of the forecasts.

In terms of magnitude, the coefficient on Sim\_Simple in column 12 ( $=0.0292$ ,  $t=2.11$ ), for example, implies that for a one-standard deviation decline in a stock’s document similarity across years, returns are 36 basis points lower per month in the future.

### *C. Long-Term Event Returns*

We also examine longer-term returns by computing cumulative event-time returns extending out one year after the release of each document. Figure 3 shows the average cumulative abnormal return for each quintile portfolio sorted based on firms similarity scores (here the Sim\_Simple measure is used), for 1 month to 12 months after portfolio formation. Figure 3 shows that returns accrue gradually over the course of the subsequent year, and do not reverse. Additionally, the long-term poor performance of Q1 (the “changers”) is particularly striking in this figure. Taken as a whole, Figure 3 suggests that the information contained in a firm’s decision to significantly change its reporting practices has a long-lasting impact on firm value.

## **IV. Mechanism**

In this section we explore the mechanism at work behind our key return results.

### A. Explaining Changes in Reporting Behavior

We begin by regressing our similarity measures on a host of characteristics of the documents in question. The goal of this exercise is to better understand what helps explain decreases in similarity across years for a given document.

We construct a variety of measures based on specific words, as well as sentiment type measures based on available word dictionaries. As noted above in our discussion of the summary statistics in Table II, we use sentiment category identifiers and word lists (e.g., measures of negative words, positive words, uncertainty, litigiousness, etc.) from Loughran and McDonald (2011)’s Master Dictionary. Specifically, the variable *Sentiment of Change* refers to the number of positive words minus the number of negative words normalized by the size of the change; *Uncertainty of Change* and the *Litigiousness of Change* refer to the number of words categorized by “uncertainty” and “litigiousness,” respectively, normalized by the size of the change; and *Change CEO* and *Change CFO* are indicator variables set equal to one if the 10-K or 10-Q mentions a change in CEO or change in CFO, respectively.

Table VI shows the results of panel regressions of document similarity (here measured as *Sim\_Simple*)<sup>8</sup> on these characteristics of the document, with firm and time fixed effects included. Table VI shows that lower similarity across documents is associated with lower sentiment, higher uncertainty, more litigiousness, and more frequent mentions of CEO and CFO changes. Each of these findings is highly statistically significant, and suggests that substantive changes in reporting practices are associated with significant changes in the operations or prospects of the firm in

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<sup>8</sup> The results for the other three measures of similarity yield the same conclusions.

question.

### *B. Isolating Key Sections of Reports*

Next we try to isolate the particular sections of the quarterly and annual reports that are associated with the largest declines in similarity across years for a given firm.

Table VII lists the standard sections that are present in firms' annual (10-K) and quarterly (10-Q) reports, respectively. Figure 4 then plots the average similarity score for different items in firms' 10-Ks, and shows that Item 7 (Management's Discussion and Analysis of Financial Condition and Results of Operations—commonly known as the MD&A section) displays a significantly lower average similarity across years than the other categories. Notably, this is the section of the 10-K where management presumably has the most discretion over the content. Similarly, Figure 5 reports the average similarity score for different items of firms' 10-Qs, and again shows that the MD&A section (here Item 2) displays the lowest average similarity relative to the other items in the report. Collectively, these figures indicate that changes in reporting practices, to the extent that they exist, are concentrated in the key sections of the reports over which management exercises the most discretion, as opposed to in purely mechanical/legal sections or in the sections that simply report standard disclosures or procedures.

### *C. Return Predictability of Key Sections of Reports*

We then take the item/section categories listed in Table VII and examine the return predictability associated with changes to each section. To do so we construct similarity measures for each item of the 10-K using only the textual portion contained

within that specific item. As before, for each of the four similarity measures, we compute quintiles based on the prior year’s distribution of similarity scores across all stocks. We report the key sections where the return predictability is most pronounced, and report these calendar-time portfolio returns in Table VIII. Table VIII indicates that changes in the MD&A section are consistently associated with significant future return predictability, although interestingly the magnitude of this effect (ranging between 12-20 basis per month) is often smaller than the effects associated with the “Legal Proceedings” category (Item 3 in the 10-K), the “Quantitative and Qualitative Disclosures About Market Risk” category (Item 7a), and particularly the “Risk Factors” section (Item 1A). Changes concentrated in the Risk Factors section, for example, yield L/S portfolio returns (Non-Changers minus Changers) of up to 188 basis points per month ( $t=2.76$ ).<sup>9</sup> These results suggest that changes to some sections may be quite subtle, and difficult for the market to detect, even though they may have large implications for future returns.

#### *D. Double-Sorts on Characteristics of the Documents*

Table IX then takes these three variables and performs double-sorts of the calendar time portfolio tests shown earlier in Table IV. Specifically, Table IX reports the calendar-time value-weight portfolio returns for samples of high and low levels of Sentiment, Uncertainty, and Litigiousness, where “low” and “high” are defined as less than the median and higher than median, respectively. For each pair of Low and High samples, we compute quintile portfolios similar to Table IV. Table IX shows that the

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<sup>9</sup> Note that this return result is still large in magnitude (over 100 basis points per month) and highly statistically significant even in the post-Sarbanes Oxley (2003-onward) sample period.

return results documented earlier are concentrated in the Low Sentiment, High Uncertainty, and High Litigiousness subsamples. For instance, the L/S spread for the Jaccard similarity measure is 71 basis points per month ( $t=3.29$ ) in the High Litigiousness subsample, and 72 basis points per month ( $t=3.51$ ) in the High Uncertainty subsample.

### *E. Robustness Checks*

Lastly, we perform a series of robustness checks to ensure that our key findings are not simply repackaging a set of previously known return predictors. To do so, we re-run the Fama-MacBeth regressions from Table V, but include a series of additional firm-level characteristics, such as accruals (to ensure that the accruals anomaly (see Sloan (1996)) is not driving our findings), investment, gross profit, and free cash flow. None of these variables drive out the return predictability associated with changes to a firm’s reporting practices (as captured by our similarity scores). Collectively our findings indicate that these subtle changes in firms’ reporting behavior have substantial predictability for future returns in a manner that has not previously been documented in the literature.

## **V. Conclusion**

In this paper we explore a subtle, but economically important “default” choice that firms make in their regular reporting practices, namely that firms overwhelmingly repeat what they most recently reported. Further, we find that when firms break with routine - breaking from former language, sections, etc. in their annual and quarterly reports – that this action contains rich, important information for future firm outcomes.

A portfolio that shorts “changers” and buys “non-changers” in annual and quarterly financial reports earns 30-60 basis points per month over the following year. The returns continue to accrue out to 18 months, and do not reverse, implying that these return movements are overreactions, but instead reflect true, fundamental changes to firms that only get gradually incorporated into asset prices over the 12-18 months after the reporting change. These reporting changes are concentrated in the management discussion (MD&A) section, which is the portion of the documents where management has the most discretion. Changes in language referring to the executive (CEO and CFO) team, and about litigation, are especially informative for future returns. Litigation language changes, for instance, imply underperformance relative to non-changers of over 8.5% per year ( $t=3.29$ ).

Our results speak to a broader literature on the power of defaults, and the implications of inertia in decision-making. By taking a twist on this literature – examining *breaks* from default behavior – we show that deviations from default behavior can have rich information for future outcomes. In an entirely non-experimental setting, across thousands of firms and almost 20 years of data, breaks from default behavior have large implications for corporations, and asset prices more generally. Given the pervasiveness of inertia in agents’ behavior across settings, and the amount of individual behaviors that are subject to these defaults within firms, the implications of *breaks* from these default behaviors in the corporate setting provide a critical, yet understudied area, in both corporate finance and asset pricing.

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Table I: Example

This table shows the first few paragraphs that are taken from Item 7, "Management's Discussion and Analysis of Financial Condition and Results of Operations", for Schweitzer-Mauduit International's (NYSE:SWM) 2004 and 2005 10-K reports. The new discussion in the 2005 10-K is highlighted.

10-K 2005	10-K 2004
<p>Outlook</p> <p>Consistent with recent historical trends, worldwide cigarette consumption is expected to increase at a rate of approximately one-half to one percent per year. The anticipated decline in the production of cigarettes in developed countries is expected to be more than offset by increased cigarette production in developing countries that currently represent approximately 70 percent of worldwide cigarette production. Age demographics and expected increases in disposable income are expected to support the increased consumption of cigarettes in developing countries. In addition, the litigation environment is different in most foreign countries compared with the United States, having less of an impact on the pricing of cigarettes, which, in turn, affects cigarette consumption. Cigarette production in the United States is expected to continue to decline as a result of a decline in domestic cigarette consumption <b>caused by increased cigarette prices, health concerns and public perceptions. As well, cigarette consumption has declined in France and Germany following recent tax increases on cigarette sales in those countries.</b></p> <p><b>We are experiencing weakness in our tobacco-related paper sales in western Europe caused by reduced cigarette consumption in several large European markets and new cigarette paper manufacturing capacity that was added in western Europe in mid-2004. This is expected to result in increased cigarette paper machine downtime in France in 2005.</b></p> <p><b>In developing countries, there is a trend toward consumption of more sophisticated cigarettes, which utilize higher quality tobacco-related papers, such as those we produce, and reconstituted tobacco leaf. This trend toward more sophisticated cigarettes reflects increased governmental regulations concerning tar delivery levels and increased competition from multinational cigarette manufacturers.</b></p> <p>Based on these trends, we expect worldwide demand for our products to continue to increase, with a shift from developed countries to developing countries. As a result, we are increasing some of our production capacity in developing countries such as Brazil, Indonesia and the Philippines.</p> <p>The new RTL production line added at our Spay, France mill, which started up in the fourth quarter of 2003, is expected to continue to contribute positively to sales volumes and operating profit in 2005.</p>	<p>Outlook</p> <p>The markets for the Company's products are expected to remain relatively stable during 2004. Trends of improvement are expected to continue in tobacco-related paper sales in several key markets. Cigarette production in the United States continues to decline as a result of declines in domestic cigarette consumption and exports of cigarettes manufactured in the United States. The anticipated decline in the production of cigarettes in developed countries is expected to be more than offset by increased cigarette production in developing countries.</p> <p>The new RTL production line added at the Company's Spay, France mill, which started up in the fourth quarter of 2003, is expected to be a major contributor to increased operating profit in 2004 compared with 2003. The new RTL production line is expected to achieve end of curve production rates by the end of the second quarter of 2004. The acquisition of a tobacco-related papers manufacturer in Indonesia that was completed in February 2004 is also expected to have a favorable impact on operating profit in 2004.</p> <p>The Company did not have significant production or sale of banded or print banded cigarette papers during 2003. The Company continues to work with its customers in their development of papers for reduced ignition propensity cigarettes. In December 2003, the State of New York announced the adoption of final regulations for reduced ignition propensity cigarettes. The cigarette fire safety standard requires that all cigarettes sold in the State of New York as of June 28, 2004 have reduced ignition propensity properties. The regulations do contain a provision that allows wholesalers and retailers to transition their existing inventories. As a result of the new fire safety standards in the State of New York, the Company expects increased sales of reduced ignition propensity cigarette papers during 2004. These reduced ignition propensity papers sell for a higher price than the conventional cigarette papers they replace and are expected to have a positive impact on the Company's financial results. Since the State of New York only represents approximately ten percent of U.S. cigarette consumption and the regulations will only be in effect for one-half of 2004, the favorable impact on the Company's financial results is not expected to be significant in 2004.</p> <p>Selling prices for the Company's tobacco-related products are expected to remain relatively stable during 2004. The recent weakening of the U.S. dollar versus the euro and certain other foreign currencies and higher wood pulp costs could enable the Company to implement selective selling price increases.</p>

**Table II:** Summary Statistics on Firms 10-Ks and 10-Qs

This table reports the summary statistics of 10-Ks and 10-Qs. 10-Ks and 10-Qs are downloaded from the SEC Edgar website and are from 1995 to 2014. Document Size is the number of words. Size of Change is the number of words on the Change. Sentiment of Change is the number of positive words minus the number of negative words normalized by the size of the Change. Uncertainty of Change and Litigious of Change are the number of words categorized as uncertainty and litigious, respectively, normalized by the size of the Change. Change CEO and Change CFO are indicator variables that equal to one if the 10-K or 10-Q mentions a change in CEO or CFO, respectively. Sentiment category identifiers (e.g., negative, positive, uncertainty, litigious) are taken from Loughran and McDonald (2011)'s Master Dictionary. ([http://www3.nd.edu/~mcdonald/Word\\_Lists.html](http://www3.nd.edu/~mcdonald/Word_Lists.html))

	Count	Mean	SD	Min	Max
Document Size	353735	159873.7	159873.7	20357	5.24e+07
Document Size - 10K	90198	308633	282473	34660	2.43e+07
Document Size - 10Q	263537	114848.4	286663.9	18824	3.14e+07
Sentiment of Change	353735	-.0003371	.0011069	-.00409	.0048492
Uncertainty of Change	353735	.0007317	.0009165	0	.004885
Litigious of Change	353735	.0003252	.0009358	0	.0037628
Change CEO	353735	.0539817	.2259819	0	1
Change CFO	353735	.0238223	.1524956	0	1

**Table III:** Summary Statistics on Similarity Measures

Panel A reports the summary statistics of four different measures of document similarity and Panel B reports the correlation between the four similarity measures. Sim\_Cosine is the cosine similarity measure, Sim\_Jaccard is the Jaccard similarity measure, Sim\_String is the minimum edit distance similarity measure, and Sim\_Simple is the simple side-by-side comparison. Details on how we compute the four similarity measures can be found in the data section.

Panel A: Summary Statistics

	Count	Mean	SD	Min	Max
Sim_Cosine	349513	0.8582	0.2118	0.0004	.9999
Sim_Jaccard	349513	0.4234	0.1957	0.0001	.9950
Sim_String	349513	0.3846	0.1881	0.0000	.9993
Sim_Simple	332821	0.1247	0.1157	0.0000	.9966

Panel B: Correlation

	Sim_Cosine	Sim_Jaccard	Sim_String	Sim_Simple
Sim_Cosine	1.0000			
Sim_Jaccard	0.6485	1.0000		
Sim_String	0.5494	0.8159	1.0000	
Sim_Simple	0.2473	0.5811	0.6317	1.0000

**Table IV:** Main Results – Portfolio

This Table reports the calendar-time portfolio returns. For each of the four similarity measures, we compute quintiles based on the prior year’s distribution of similarity scores across all stocks. Stocks then enter the quintile portfolio in the month after the public release of one of their 10-K or 10-Q reports. Firms are held in the portfolio for 3 months. We report Excess Return (return minus risk free rate), Fama-French 3-factor alphas (market, size, and value), and 5-factor alphas (market, size, value, momentum, and liquidity). Panel A reports equal-weight portfolio returns. Panel B reports value-weight portfolio returns.

Panel A: Equally Weighted

Sim_Cosine							Sim_Jaccard						
	Q1	Q2	Q3	Q4	Q5	Q5 – Q1		Q1	Q2	Q3	Q4	Q5	Q5 – Q1
Excess	0.0065*	0.0076**	0.0072**	0.0090***	0.0094***	0.0029***	Excess	0.0062	0.0064*	0.0074**	0.0091***	0.0102***	0.0040***
Return	(1.7399)	(2.0505)	(2.1098)	(2.7231)	(2.8340)	(3.0098)	Return	(1.6054)	(1.7128)	(2.1018)	(2.7459)	(3.2587)	(2.9151)
3-Factor	-0.0013*	-0.0004	-0.0005	0.0014*	0.0020***	0.0033***	3-Factor	-0.0017**	-0.0017**	-0.0005	0.0015**	0.0029***	0.0046***
Alpha	(-1.8818)	(-0.5930)	(-0.6561)	(1.7571)	(2.7378)	(4.2597)	Alpha	(-2.1802)	(-2.2939)	(-0.6491)	(2.1239)	(3.7939)	(4.9218)
5-Factor	-0.0011	-0.0001	-0.0004	0.0014*	0.0023***	0.0034***	5-Factor	-0.0015*	-0.0015**	-0.0003	0.0018**	0.0030***	0.0045***
Alpha	(-1.6121)	(-0.1529)	(-0.6093)	(1.8892)	(3.4372)	(4.2956)	Alpha	(-1.9647)	(-2.0640)	(-0.4713)	(2.5846)	(4.1026)	(4.7260)
Sim_MinEdit							Sim_Simple						
	Q1	Q2	Q3	Q4	Q5	Q5 – Q1		Q1	Q2	Q3	Q4	Q5	Q5 – Q1
Excess	0.0064*	0.0073*	0.0070*	0.0089***	0.0097***	0.0033**	Excess	0.0072*	0.0079**	0.0082**	0.0090***	0.0090***	0.0018
Return	(1.6890)	(1.9512)	(1.9389)	(2.6620)	(3.2834)	(2.4480)	Return	(1.8671)	(2.1185)	(2.3413)	(2.7340)	(3.0359)	(1.2038)
3-Factor	-0.0016**	-0.0007	-0.0009	0.0013*	0.0027***	0.0043***	3-Factor	-0.0008	-0.0002	0.0003	0.0014**	0.0020**	0.0028***
Alpha	(-2.2247)	(-0.9848)	(-1.4068)	(1.7767)	(3.6470)	(5.4785)	Alpha	(-1.0934)	(-0.2075)	(0.3834)	(2.0139)	(2.5730)	(3.2194)
5-Factor	-0.0013*	-0.0005	-0.0006	0.0013*	0.0028***	0.0041***	5-Factor	-0.0006	0.0003	0.0004	0.0016**	0.0021***	0.0027***
Alpha	(-1.9301)	(-0.7328)	(-0.9783)	(1.9446)	(3.8337)	(5.1380)	Alpha	(-0.8898)	(0.3700)	(0.6345)	(2.3037)	(2.6774)	(3.0117)

Panel B: Value Weighted

Sim_Cosine							Sim_Jaccard						
	Q1	Q2	Q3	Q4	Q5	Q5 - Q1		Q1	Q2	Q3	Q4	Q5	Q5 - Q1
Excess	0.0040	0.0044	0.0051	0.0079**	0.0078**	0.0038***	Excess	0.0015	0.0055	0.0072**	0.0072**	0.0076**	0.0061***
Return	(1.2095)	(1.3085)	(1.6391)	(2.5627)	(2.3629)	(2.7547)	Return	(0.4459)	(1.6504)	(2.2260)	(2.3058)	(2.5168)	(3.9898)
3-Factor	-0.0018**	-0.0019**	-0.0007	0.0018**	0.0019*	0.0037***	3-Factor	-0.0046***	-0.0005	0.0012	0.0013	0.0018*	0.0063***
Alpha	(-2.0280)	(-2.1017)	(-0.7910)	(1.9748)	(1.7411)	(2.7024)	Alpha	(-4.8741)	(-0.4956)	(1.1990)	(1.3893)	(1.6714)	(4.4578)
5-Factor	-0.0013	-0.0021**	-0.0009	0.0021**	0.0021*	0.0034**	5-Factor	-0.0044***	-0.0004	0.0014	0.0012	0.0019*	0.0063***
Alpha	(-1.4101)	(-2.2624)	(-1.0640)	(2.3542)	(1.9115)	(2.3996)	Alpha	(-4.5642)	(-0.3962)	(1.4451)	(1.2487)	(1.8656)	(4.4351)
Sim_MinEdit							Sim_Simple						
	Q1	Q2	Q3	Q4	Q5	Q5 - Q1		Q1	Q2	Q3	Q4	Q5	Q5 - Q1
Excess	0.0036	0.0043	0.0068**	0.0077**	0.0077***	0.0041**	Excess	0.0024	0.0061*	0.0077**	0.0078**	0.0074**	0.0050***
Return	(1.0609)	(1.2900)	(2.0867)	(2.5586)	(2.6093)	(2.4051)	Return	(0.6879)	(1.8821)	(2.4476)	(2.5284)	(2.4775)	(2.6924)
3-Factor	-0.0025***	-0.0018*	0.0007	0.0020**	0.0020*	0.0045***	3-Factor	-0.0039***	0.0002	0.0018*	0.0019*	0.0019	0.0058***
Alpha	(-2.8874)	(-1.8498)	(0.7883)	(2.1000)	(1.8087)	(3.0695)	Alpha	(-3.8893)	(0.1802)	(1.8704)	(1.8797)	(1.4452)	(3.5865)
5-Factor	-0.0021**	-0.0016	0.0009	0.0020**	0.0012	0.0033**	5-Factor	-0.0036***	0.0005	0.0018*	0.0018*	0.0015	0.0051***
Alpha	(-2.4416)	(-1.6325)	(1.1168)	(2.1022)	(1.0502)	(2.2778)	Alpha	(-3.4960)	(0.6607)	(1.7835)	(1.7139)	(1.1461)	(3.1419)



**Table V:** Main Results – Fama MacBeth Regression

This Table reports the Fama-MacBeth cross-sectional regressions of individual firm-level stock returns on our 4 similarity measures and a host of known return predictors. Size is log of market value of equity, log(BM) is log book value of equity over market value of equity, Ret(-1,0) is previous month's return, and Ret(-12, -1) is the cumulative return from month -12 to month -1. SUE is the standardized unexpected earning and computed as actual earnings per share minus average analyst forecast earnings per share, divided by the standard deviation of the forecasts.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Ret												
Sim_Cosine	0.0045*** (2.6469)	0.0031** (2.5103)	0.0037** (2.1751)									
Sim_Jaccard				0.0082*** (3.2607)	0.0066*** (3.8197)	0.0059*** (3.4063)						
Sim_MinEdit							0.0054** (2.5398)	0.0041*** (2.7795)	0.0029** (1.9970)			
Sim_Simple										0.0404** (2.1031)	0.0302** (2.2484)	0.0292** (2.1099)
Size		0.0000 (0.1111)	0.0000 (0.0507)		0.0001 (0.2496)	0.0001 (0.1133)		0.0001 (0.2558)	0.0001 (0.0980)		0.0001 (0.2385)	0.0000 (0.0485)
log(BM)		0.0017* (1.8936)	0.0016* (1.7142)		0.0017* (1.8797)	0.0016* (1.7047)		0.0017* (1.8955)	0.0016* (1.7163)		0.0017* (1.8740)	0.0016* (1.6957)
Ret(-1,0)		-0.0260*** (-3.9281)	-0.0243*** (-3.6827)		-0.0263*** (-3.9704)	-0.0244*** (-3.7026)		-0.0263*** (-3.9731)	-0.0244*** (-3.6930)		-0.0263*** (-3.9852)	-0.0245*** (-3.7105)
Ret(-12,-1)		0.0064** (2.3394)	0.0036 (1.2457)		0.0064** (2.3407)	0.0036 (1.2502)		0.0064** (2.3357)	0.0036 (1.2438)		0.0064** (2.3469)	0.0037 (1.2934)
SUE			0.0007*** (6.5591)			0.0007*** (6.5442)			0.0007*** (6.5584)			0.0007*** (6.4993)
Cons	0.0058 (1.4516)	0.0058 (0.6721)	0.0067 (0.5684)	0.0064 (1.6348)	0.0046 (0.5171)	0.0069 (0.5814)	0.0076** (1.9765)	0.0057 (0.6369)	0.0084 (0.7057)	-0.0238 (-1.3069)	-0.0176 (-1.0217)	-0.0142 (-0.7060)
R-Squared	0.0006	0.0427	0.0485	0.0017	0.0432	0.0489	0.0017	0.0432	0.0488	0.0019	0.0435	0.0492
N	713451	713451	496084	713451	713451	496084	713451	713451	496084	713680	713680	495931

**Table VI:** Potential Mechanism

This Table reports potential mechanism of our results. We regress our similarity measure on a host of characteristics of the document in question. Sentiment is the number of positive words in the change minus the number of negative words in the change normalized by the size of the Change. Uncertainty and Litigious of Change are the number of words categorized as uncertainty and litigious, respectively, normalized by the size of the Change. Change CEO and Change CFO are indicator variables that equal to one if the 10-K or 10-Q mentions a change in CEO or CFO, respectively. Sentiment category identifiers (e.g., negative, positive, uncertainty, litigious) are taken from Loughran and McDonald (2011)'s Master Dictionary. ([http://www3.nd.edu/~mcdonald/Word\\_Lists.html](http://www3.nd.edu/~mcdonald/Word_Lists.html)) All regressions include Firm Fixed Effect and Month Fixed Effect.

	(1)	(2)	(3)	(4)	(5)
	Sim	Simple			
Sentiment	3.5595*** (90.4767)				
Uncertainty		-3.5497*** (-33.1870)			
Litigious			-0.1264*** (-13.2670)		
Change CEO				-0.0076*** (-10.4748)	
Change CFO					-0.0086*** (-8.0932)
Constant	0.1875*** (28.8477)	0.1841*** (28.0393)	0.1827*** (27.7814)	0.1836*** (27.9144)	0.1831*** (27.8337)
Firm Effect	Yes	Yes	Yes	Yes	Yes
Time Effect	Yes	Yes	Yes	Yes	Yes
R-Squared	0.0816	0.0624	0.0606	0.0610	0.0604
N	338138	338138	338138	338138	338138

**Table: VII - Item Definition in 10Ks and 10-Qs**

	Form 10-K
Item 1	Business
Item 1A	Risk Factors
Item 2	Properties
Item 3	Legal Proceedings
Item 4	Mine Safety Disclosures
Item 5	Market for Registrant’s Common Equity, Related Stockholder Matters and Issuer Purchases of Equity Securities
Item 6	Selected Financial Data
Item 7	Management’s Discussion and Analysis of Financial Condition and Results of Operations
Item 7A	Quantitative and Qualitative Disclosures About Market Risk
Item 8	Financial Statements and Supplementary Data
Item 9	Changes in and Disagreements With Accountants on Accounting and Financial Disclosure
Item 9A	Controls and Procedures
Item 9B	Other Information
Item 10	Directors, Executive Officers and Corporate Governance
Item 11	Executive Compensation
Item 12	Security Ownership of Certain Beneficial Owners and Management and Related Stockholder Matters
Item 13	Certain Relationships and Related Transactions, and Director Independence
Item 14	Principal Accounting Fees and Services
	Form 10-Q
Item 1	Financial Statements
Item 2	Management’s Discussion and Analysis of Financial Condition and Results of Operations
Item 3	Quantitative and Qualitative Disclosures About Market Risk
Item 4	Controls and Procedures
Item 21	Legal Proceedings
Item 21A	Risk Factors
Item 22	Unregistered Sales of Equity Securities and Use of Proceeds
Item 23	Defaults Upon Senior Securities
Item 24	Mine Safety Disclosures
Item 25	Other Information

**Table VIII:** Mechanism – In which sections do changes matter most?

This Table reports the calendar-time portfolio returns. Similarity measures for each item are computed using only the textual portion in that item. For each of the four similarity measures, we compute quintiles based on the prior year's distribution of similarity scores across all stocks. Stocks then enter the quintile portfolio in the month after the public release of one of their 10-K or 10-Q reports. Firms are held in the portfolio for 3 months. We report Excess Return (return minus risk free rate), Fama-French 3-factor alphas (market, size, and value), and 5-factor alphas (market, size, value, momentum, and liquidity) of the top minus bottom quintile portfolio (Q5 – Q1). Panel A reports equal-weight portfolio returns. Panel B reports value-weight portfolio returns.

## Panel A: Equally Weighted

	Excess Return	Sim_Cosine		Excess Return	Sim_Jaccard	
		3-Factor Alpha	5-Factor Alpha		3-Factor Alpha	5-Factor Alpha
Management's Discussion and Analysis	0.0013 (1.5648)	0.0011* (1.6579)	0.0012* (1.6751)	0.0021** (2.5054)	0.0022*** (3.1451)	0.0020*** (2.8061)
Legal Proceedings	0.0036** (2.2428)	0.0037*** (3.0939)	0.0033*** (2.6989)	0.0028 (1.5729)	0.0030** (2.3602)	0.0025* (1.9341)
Quantitative and Qualitative Disclosures About Market Risk	0.0069*** (2.7465)	0.0068*** (2.6923)	0.0068*** (2.6481)	0.0020** (2.3738)	0.0021*** (2.9594)	0.0019*** (2.6049)
Risk Factors	0.0114 (1.6111)	0.0118 (1.6308)	0.0118 (1.6365)	0.0143** (2.1325)	0.0144** (2.4497)	0.0188*** (2.7601)
Other Information	0.0020 (1.0839)	0.0027 (1.4684)	0.0036* (1.9179)	0.0031* (1.7849)	0.0037** (2.1854)	0.0040** (2.2959)
	Excess Return	Sim_MinEdit		Excess Return	Sim_Simple	
		3-Factor Alpha	5-Factor Alpha		3-Factor Alpha	5-Factor Alpha
Management's Discussion and Analysis	0.0018* (1.9519)	0.0022*** (3.1616)	0.0019*** (2.6652)	0.0019*** (2.6673)	0.0019** (2.5405)	0.0017*** (2.3253)
Legal Proceedings	0.0022 (1.2706)	0.0025** (2.3030)	0.0022* (1.9347)	0.0013 (0.8157)	0.0016 (1.4119)	0.0012 (1.1042)
Quantitative and Qualitative Disclosures About Market Risk	0.0016 (1.1822)	0.0023* (1.7374)	0.0022* (1.6712)	0.0013 (0.1581)	0.0011 (0.1319)	0.0007 (0.0801)
Risk Factors	0.0102 (1.1928)	0.0185*** (2.7728)	0.0138** (2.1663)	0.0125* (1.9310)	0.0154** (2.1914)	0.0177** (2.1156)
Other Information	0.0009 (0.5773)	0.0014 (0.9649)	0.0016 (1.0514)	0.0022 (1.2731)	0.0026** (2.3091)	0.0022* (1.9525)

Panel B: Value Weighted

	Excess Return	Sim_Cosine		Excess Return	Sim_Jaccard	
		3-Factor Alpha	5-Factor Alpha		3-Factor Alpha	5-Factor Alpha
Management's Discussion and Analysis	0.0027* (1.8009)	0.0028* (1.8471)	0.0022 (1.4237)	0.0047*** (2.8834)	0.0043*** (2.6347)	0.0033** (2.0151)
Legal Proceedings	0.0035* (1.6643)	0.0032 (1.5347)	0.0032 (1.4722)	0.0018 (0.8050)	0.0010 (0.4609)	0.0005 (0.2127)
Quantitative and Qualitative Disclosures About Market Risk	0.0039 (1.3980)	0.0044 (1.5716)	0.0045 (1.6159)	0.0047*** (2.8918)	0.0042*** (2.6005)	0.0038** (2.3723)
Risk Factors	0.0144* (1.9625)	0.0150** (2.0069)	0.0156** (2.0470)	0.0118* (1.8999)	0.0165*** (2.7450)	0.0156** (2.5669)
Other Information	0.0073** (2.1343)	0.0075** (2.2083)	0.0080** (2.3014)	0.0054 (1.5574)	0.0049 (1.4249)	0.0043 (1.2049)
	Excess Return	Sim_MinEdit		Excess Return	Sim_Simple	
		3-Factor Alpha	5-Factor Alpha		3-Factor Alpha	5-Factor Alpha
Management's Discussion and Analysis	0.0047*** (2.6718)	0.0044*** (2.6389)	0.0033* (1.9706)	0.0038** (2.0562)	0.0037** (2.1179)	0.0025 (1.4231)
Legal Proceedings	0.0014 (0.6083)	0.0005 (0.2467)	0.0007 (0.2985)	0.0030 (1.2640)	0.0024 (1.0351)	0.0027 (1.1573)
Quantitative and Qualitative Disclosures About Market Risk	0.0000 (0.0149)	0.0014 (0.6396)	0.0012 (0.6135)	0.0013 (0.1581)	0.0011 (0.1319)	0.0007 (0.0801)
Risk Factors	0.0095 (1.1777)	0.0151** (2.2874)	0.0105* (1.6658)	0.0125 (1.5388)	0.0133 (1.6108)	0.0085 (1.0385)
Other Information	0.0022 (0.6272)	0.0011 (0.3286)	0.0009 (0.2515)	0.0013 (0.3783)	0.0002 (0.0678)	0.0000 (0.0146)

**Table IX:** Mechanism – What types of changes matter most?

This Table reports robustness checks of the types of textual changes that matter most. We split on median reference to a number of different attributes of the text change itself: Sentiment, Uncertainty, and the Litigiousness of the change.

		Sim_Cosine						Sim_Jaccard					
		Q1	Q2	Q3	Q4	Q5	Q5 - Q1	Q1	Q2	Q3	Q4	Q5	Q5 - Q1
Sentiment	Low	-0.0009	-0.0049**	-0.0011	0.0001	0.0018	0.0026	-0.0045***	-0.0044***	-0.0024	0.0023	0.0009	0.0054**
		(-0.7123)	(-2.4323)	(-0.8359)	(0.0655)	(1.5807)	(1.4798)	(-2.7913)	(-3.1639)	(-1.2370)	-1.6184	-0.6911	-2.4101
	High	0.0017	-0.0022	0.0004	0.0013	0.0021	0.0006	0.0008	0.0004	0.0013	0.0022	0.0015	0.0011
		(1.2713)	(-1.4511)	(0.2767)	(0.9940)	(1.5911)	(0.3044)	-0.6297	-0.266	-0.7833	-1.5338	-1.2704	-0.6093
Uncertainty	Low	-0.0003	-0.0024	0.0012	0.0014	0.0018	0.0021	-0.0023*	-0.0034**	0.002	0.0025*	0.002	0.0044**
		(-0.2047)	(-1.5217)	(0.8707)	(1.0239)	(1.3515)	(1.0751)	(-1.6548)	(-2.0413)	-1.2431	-1.8589	-1.4689	-2.4187
	High	-0.0022*	-0.0007	0.0006	0.0007	0.0005	0.0032*	-0.0054***	-0.001	0	0.0008	0.0013	0.0072***
		(-1.7899)	(-0.4183)	(0.4222)	(0.4518)	(0.4417)	(1.8134)	(-3.1124)	(-0.7230)	(-0.0218)	-0.5928	-1.1628	-3.5092
Litigious	Low	-0.0010	-0.0032**	0.0015	0.0018	0.0004	0.0014	-0.0029**	-0.0042***	0.0013	0.0011	0.0016	0.0047**
		(-0.7701)	(-2.0781)	(1.0152)	(1.2306)	(0.3863)	(0.8268)	(-1.9848)	(-2.6452)	-0.774	-0.8267	-1.0496	-2.1829
	High	-0.0023*	-0.0007	0.0010	0.0024*	0.0012	0.0040**	-0.0048***	-0.0011	0.0006	0.0024**	0.002	0.0071***
		(-1.8054)	(-0.4501)	(0.7448)	(1.8381)	(1.0190)	(2.2466)	(-2.7580)	(-0.7463)	-0.3233	-2.0542	-1.5655	-3.2909
		Sim_MinEdit						Sim_Simple					
		Q1	Q2	Q3	Q4	Q5	Q5 - Q1	Q1	Q2	Q3	Q4	Q5	Q5 - Q1
Sentiment	Low	-0.0036**	-0.0022	0.0016	-0.0008	0.0013	0.0048**	-0.0047***	-0.0024	-0.0001	0.0027**	0.0010	0.0057***
		(-2.3516)	(-1.5372)	(1.1200)	(-0.6059)	(0.9551)	(2.1460)	(-3.3643)	(-1.5296)	(-0.1041)	(2.0023)	(0.7035)	(2.6567)
	High	-0.0002	-0.0002	0.0006	0.0004	0.0026*	0.0032	0.0011	0.0006	0.0008	0.0009	0.0020	0.0012
		(-0.1464)	(-0.1844)	(0.4199)	(0.2755)	(1.6932)	(1.5618)	(0.8134)	(0.6002)	(0.5391)	(0.5091)	(1.1541)	(0.5032)
Uncertainty	Low	-0.0033**	0.0004	-0.0015	0.0014	-0.0003	0.0033*	-0.0017	-0.0013	-0.0001	0.0017	0.0022	0.0038*
		(-2.0092)	(0.2767)	(-1.1442)	(0.8347)	(-0.1981)	(1.6723)	(-1.1747)	(-1.0097)	(-0.0768)	(1.3819)	(1.4079)	(1.8473)
	High	-0.0014	-0.0021	0.0012	0.0017	0.0026*	0.0041**	-0.0041**	-0.0008	0.0030***	0.0012	0.0007	0.0051**
		(-1.0799)	(-1.5031)	(0.9572)	(1.2670)	(1.7718)	(2.0624)	(-2.2905)	(-0.6771)	(2.6108)	(0.6432)	(0.3959)	(2.1409)
Litigious	Low	-0.0005	-0.0022	-0.0005	-0.0008	0.0032**	0.0038*	-0.0023	-0.0030**	0.0019	-0.0007	0.0016	0.0039*
		(-0.4520)	(-1.3860)	(-0.3590)	(-0.5422)	(2.0016)	(1.9562)	(-1.6448)	(-2.2771)	(1.6493)	(-0.5575)	(1.0031)	(1.8726)
	High	-0.0032*	0.0001	-0.0004	0.0027**	0.0016	0.0051**	-0.0035**	-0.0001	0.0028**	0.0030**	0.0010	0.0049**
		(-1.9640)	(0.0807)	(-0.3698)	(1.9978)	(0.9775)	(2.2169)	(-2.0759)	(-0.1127)	(2.4679)	(2.1654)	(0.6788)	(2.0119)

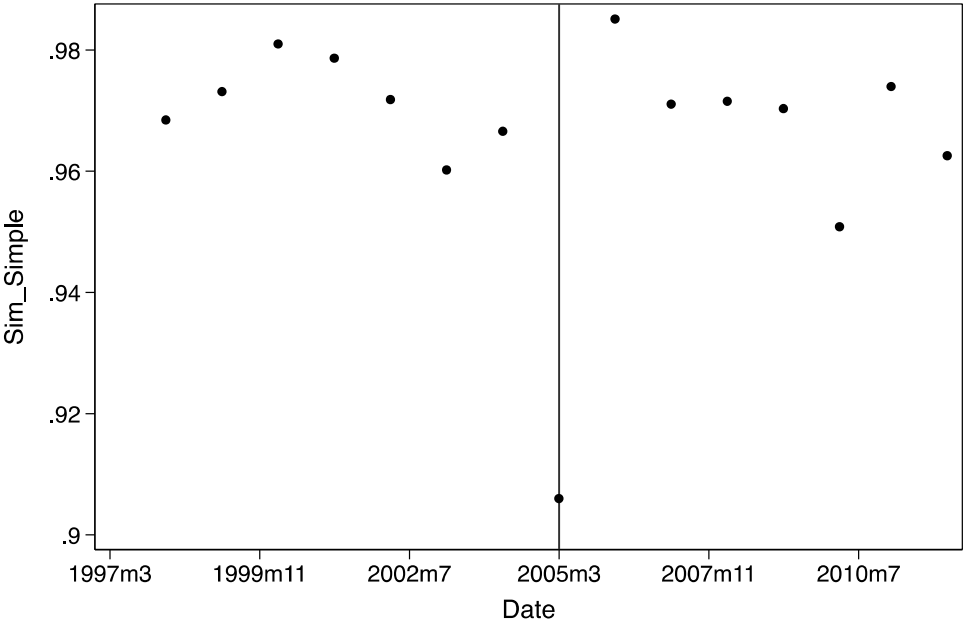
**Table X:** Robustness of Changes – Additional Controls

This table reports the Fama-MacBeth cross-sectional regressions of individual firm-level stock returns on our 4 similarity measures and a host of known return predictors. Size is log of market value of equity, log(BM) is log book value of equity over market value of equity, Ret(-1,0) is previous month's return, and Ret(-12, -1) is the cumulative return from month -12 to month -1. Invest is capx/ppent. GrossProfit is (revt-cogs)/at. FreeCashFlow is (ni + dp - wcapch - capx). Accrual is ( $\Delta$ act - chech -  $\Delta$ lct +  $\Delta$ dct +  $\Delta$ txp - dp) scaled by average assets ( $at/2 + \log(at)/2$ )

	(1)	(2)	(3)	(4)
	Ret			
Sim_Cosine	0.0056*** (3.0429)			
Sim_Jaccard		0.0044*** (2.7556)		
Sim_MinEdit			0.0024* (1.9725)	
Sim_Simple				0.0173** (1.9935)
Size	-0.0002 (-0.3633)	-0.0001 (-0.2574)	-0.0001 (-0.2565)	-0.0001 (-0.1548)
log(BM)	0.0018 (0.7027)	0.0018 (0.7127)	0.0017 (0.7017)	0.0015* (1.6527)
Ret(-1,0)	-0.0299*** (-4.1986)	-0.0299*** (-4.1663)	-0.0298*** (-4.1313)	-0.0340*** (-4.5371)
Ret(-12,-1)	0.0084** (2.4815)	0.0083** (2.4526)	0.0084** (2.4867)	0.0062** (2.2197)
Invest	-0.0044 (-1.6277)	-0.0042 (-1.5790)	-0.0043 (-1.5971)	-0.0046* (-1.7823)
GrossProfit	0.0046** (2.3736)	0.0046** (2.3503)	0.0045** (2.3132)	0.0051** (2.5002)
FreeCashflow	0.0048 (1.1198)	0.0045 (1.0488)	0.0049 (1.1466)	0.0037 (0.8334)
Accrual	-0.0113*** (-2.8590)	-0.0113*** (-2.8637)	-0.0114*** (-2.8846)	-0.0058*** (-2.6575)
Cons	0.0047 (0.5067)	0.0071 (0.7797)	0.0080 (0.8793)	-0.0075 (-0.3988)
R-Squared	0.0809	0.0812	0.0812	0.0019
N	607864	607864	607864	600075

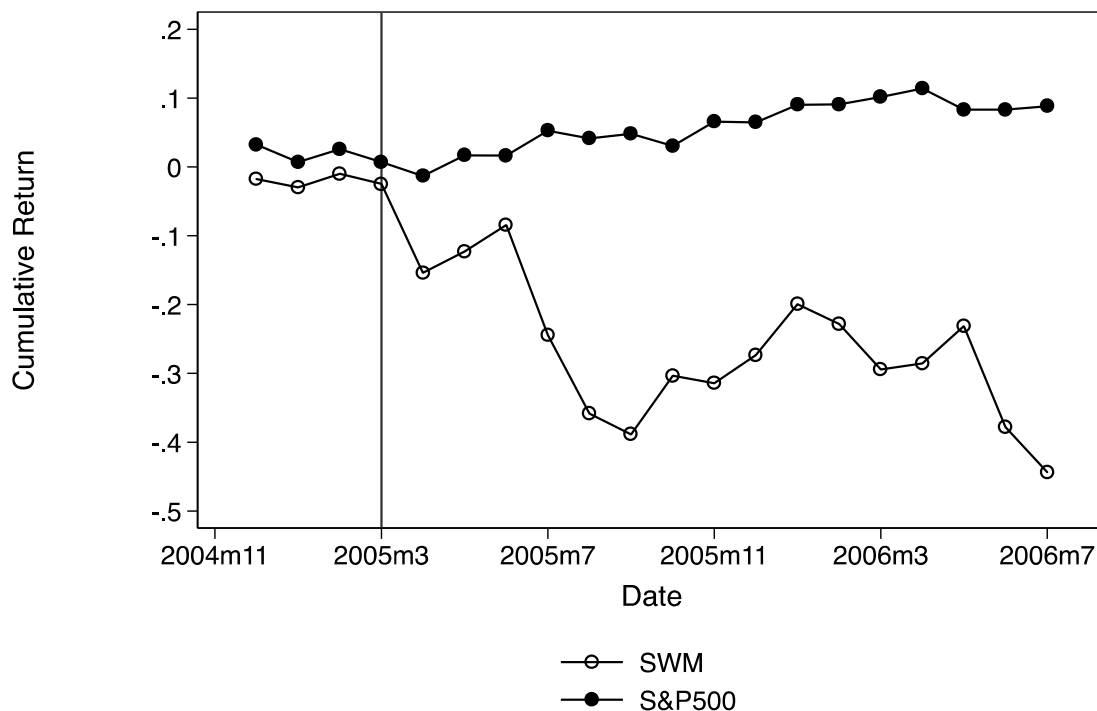
**Figure 1:** Example Schweitzer-Mauduit International Similarity Score

This figure plots the similarity score of Schweitzer-Mauduit International annual reports (10-Ks) from 2001 to 2009.





**Figure 2:** Schweitzer-Mauduit International Cumulative Return



#### Events:

**March 7, 2005:** Schweitzer-Mauduit filed form 10-K with *new paragraphs* in the “Manager Discussion” section, cautioned about “weakness in our tobacco-related paper sales in western Europe”:

“caused by increased cigarette prices, health concerns and public perceptions. As well, cigarette consumption has declined in France and Germany following recent tax increases on cigarette sales in those countries.

We are experiencing weakness in our tobacco-related paper sales in western Europe caused by reduced cigarette consumption in several large European markets and new cigarette paper manufacturing capacity that was added in western Europe in mid-2004. This is expected to result in increased cigarette paper machine downtime in France in 2005.

In developing countries, there is a trend toward consumption of more sophisticated cigarettes, which utilize higher quality tobacco-related papers, such as those we produce, and reconstituted tobacco leaf. This trend toward more sophisticated cigarettes reflects increased governmental regulations concerning tar delivery levels and increased competition from multinational cigarette manufacturers.”

**May 6, 2005:** Schweitzer-Mauduit filed form 10-Q, with these *new paragraphs*:

“Unit sales volumes declined by 6 percent compared with last year, having an unfavorable \$5.7 million, or 4 percent, impact on the net sales comparison

Sales volumes of the French segment declined 12 percent year-over-year, primarily as a result of lower sales of RTL products. The decline in RTL sales volumes was caused by differences in the timing of customer orders. First quarter of 2004 volumes included, in-part, a restocking of customer RTL inventories following start-up of new RTL production capacity at the end of 2003.

*French* segment net sales declined \$2.7 million, or 3 percent, from 2004 to 2005. The decline in sales volumes, in large part due to lower sales of RTL products, provided the majority of this decline. The decline in RTL sales volumes was caused by differences in the timing of customer orders.”

August 5, 2005: Schweitzer-Mauduit filed form 10-Q, with these *new* paragraphs:

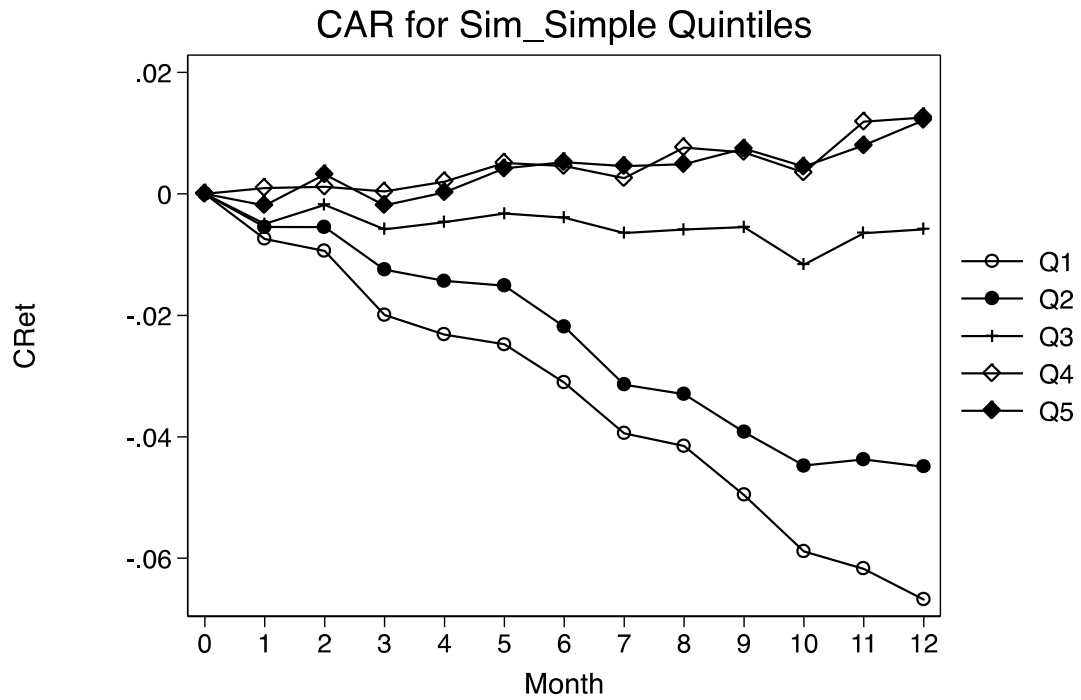
“Unit sales volumes decreased by 1 percent compared with the first six months of last year, but as a result of a change in product sales mix, volume changes contributed \$0.4 million to the net sales improvement.

Sales volumes of the French segment declined 6 percent year-over-year. RTL sales volumes were 11 percent below the prior year and tobacco-related papers sales declined 3 percent from the prior-year comparable period. Increased sales of RTL products are anticipated during the second half of 2005.

*French* segment net sales declined \$0.4 million from 2004 to 2005. The decline in sales volumes, in large part due to lower sales of RTL products, provided the majority of this decline. Lower sales volumes and lower product selling prices were partially offset by favorable currency exchange rates, a direct result of a stronger euro versus the U.S. dollar.”

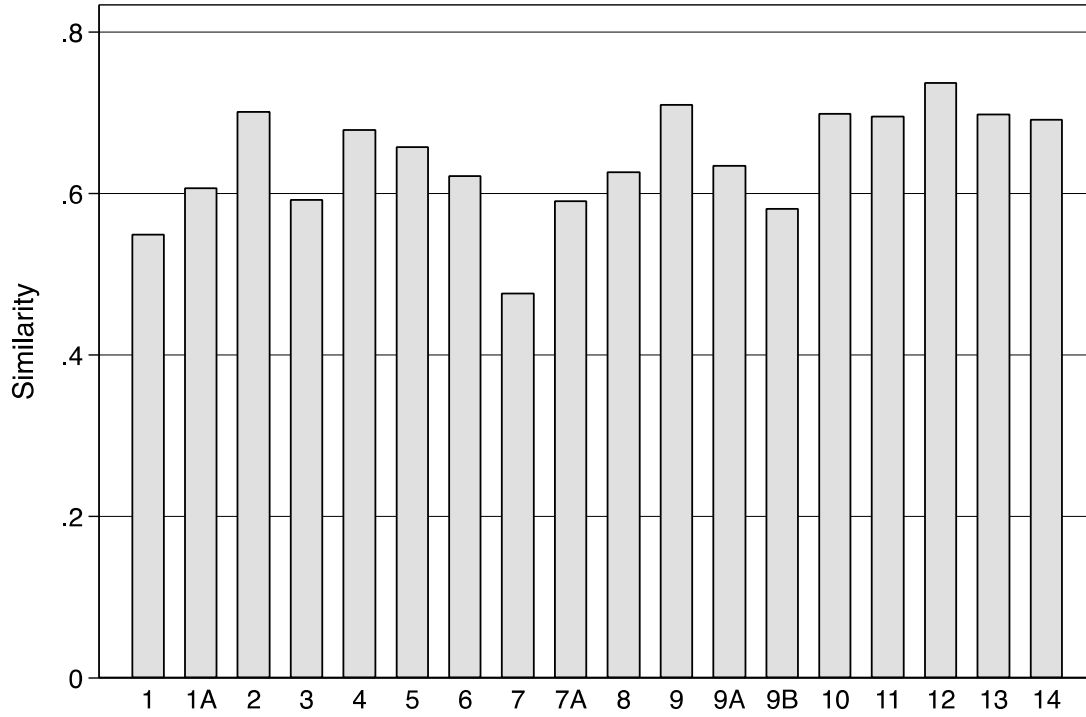
**Figure 3:** Long term no reversals

This figure shows the average cumulative abnormal return for each quintile portfolio sorted based on firms' similarity score, for 1 month to 12 months after portfolio formation.



**Figure 4:** Which Sections Change the Most – 10K

This figure reports the average similarity score for different items of firms' 10-Ks.



**Figure 5:** Which Sections Change the Most – 10Q

This figure reports the average similarity score for different items of firms' 10-Qs.

