Do Inflation Adjustments Lead to Inflated Earnings?
Large Sample Evidence of Managerial Discretion

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Abstract

This study examines the reporting behavior of a large sample of private firms before and after the elimination in 2007 of an inflation adjustment system in Colombia. We show that firms avoid reporting small losses by exercising considerable discretion in their use of inflation adjustments, and find that this discretion is greater for firms that rely more on bank financing. We also find that firms that manage earnings are able to issue relatively more short-term debt the year following the reporting. After the removal of the inflation adjustment system in 2007, we find an increase in non-operating revenues for firms just below the zero-operating earnings threshold. This result is driven at least in part by an increase in the use of real activities through assets sales. Our results suggest that firms adapt to changes in accounting rules by adopting new strategies to achieve certain reporting goals.

Keywords: accounting discretion, inflation adjustments, earnings management, earnings distribution, bank monitoring, private firms

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1. Introduction

In this paper, we exploit a quasi-natural experiment: the use and subsequent elimination of an inflation adjustments system in Colombia, to shed new light on the motives, methods and consequences of managing earnings among private companies. While a large body of literature studies the mechanisms driving earnings quality among public firms, relatively few studies have examined their prevalence in private companies. For example, Beatty, Ke and Petroni (2002) find that private banks in the U.S. engage in earnings management less often than their publicly traded counterparts. In contrast, Burgstahler, Hail and Leuz (2006) study a sample of European countries and find that privately held companies exhibit higher levels of earnings management. Using a similar sample of European firms, Coppens and Peek (2005) show that tax incentives play a role in private firms' incentives to report positive after-tax profits. We extend these findings by looking at both cross-sectional and time-series behavior of earnings management among private firms in a unique setting offered by Colombia over the period 2003-2010.[1]

Estimating the presence of earnings management presents several challenges. First, researchers generally have to rely on models for discretionary accruals (e.g. Dechow et al., 2003), or real activities manipulations (e.g. Roychowdhury, 2006). One particular issue in these studies however, is that researchers need to develop a model to estimate "abnormal" reporting behavior based on "normal" behavior, and hence may suffer from a lack of power if their model is misspecified. Second, in the context of large sample properties around the zero-earnings threshold (e.g. Hayn (1995), Burgstahler and Dichev (1997) and Degeorge, Patel, and Zeckhauser (1999)), most studies define "suspect" firms *ex post*, as those showing a small net profit and, as such, may classify firms as suspect when they are actually already showing a profit prior to any earnings management. Further, distribution-based evidence of earnings management typically does not provide the nature of the accounting discretion being used to report positive earnings.

Our empirical setting offers four key features that allow us to better identify firms' ability and incentives to manage earnings, without having to rely on a model of "normal" behavior. First, before the inflation adjustment system was eliminated in 2007, Colombian firms could

[1] Privately held companies represent the vast majority of firms in Colombia. In 2007 for instance – the year inflation adjustments were eliminated – a total of 21,734 private firms reported their financial statements to Colombia's Corporations Superintendence. In contrast, there were only 92 listed firms in Colombia's stock exchange (BVC) that same year. Public firms are not part of our dataset.

exercise considerable discretion in their reporting through the use of inflation adjustments.[2] As such, we extend to a broad cross-section the studies that have relied on specific contexts where the discretionary nature of a given line item could be gauged more precisely (e.g. Beatty et al., 2002; Beaver et al., 2003; and Hann and Lu, 2009).[3]

Second, the net effect of all balance sheet-related inflation adjustments (IA) is reported as a separate line item in the income statement, directly above earnings before tax (EBT). In such a setting, we can sort firms based on their *ex ante* incentives to manage earnings: as inflation adjustments are reported between earnings before inflation adjustments and taxes (EBAT) and earnings before taxes (EBT), our "suspect" firms are those with small losses *before* inflation adjustments. That is, in contrast to much of the literature, we can avoid classifying firms as suspect when they are already showing a profit prior to potential inflation adjustment-related earnings management. Specifically, we first determine the extent of earnings management in our sample by testing whether firms that show a slight loss before inflation adjustments use this line item differently than firms showing a small profit before inflation adjustments.

Third, by focusing on a large sample of private firms in a bank centric economy, we can test for one of the potential incentives for private firms to manage earnings: maintaining access to bank financing. Although private firms are not exposed to the same pressure from capital markets, the empirical evidence from studies analyzing differences in reporting behavior between private and public firms is somewhat mixed (e.g. Beatty, Ke and Petroni (2002), Ball and Shivakumar (2005), Coppens and Peek (2005) and Burgstahler, Hail and Leuz (2006)).[4] A potential manner in which we can reconcile some of these findings is to investigate which private firms are subject to the most pressure to manage earnings. In particular, the debt monitoring hypothesis suggests that private firms with significant exposure to bank debt will be more closely

[2] See Section 2 for details.

[3] Beatty et al. (2002) and Beaver et al. (2003) respectively focus on the banking and insurance sector where precise measures of reporting discretion are available and find significant discretion in the use of loan loss provisions and loss reserves. Hann and Lu (2009) make use of the considerable discretion in the allocation of overhead costs across divisions for managers of conglomerates to relate discontinuities in segment-level profitability to earnings manipulations across business units. Taking a slightly different approach, Donelson, McInnis, and Mergenthaler (2013) focus on a subset of firms that settled accounting-related securities class action lawsuits. They find that the distribution of restated earnings does not exhibit the same discontinuities as the distribution of originally reported earnings.

[4] In a related but somewhat different strand of the literature, Ball and Shivakumar (2005) focus on the *quality* of reporting between private and public firms and show that private firms are less timely in their loss recognition than their publicly-traded counterparts in the U.K. Other studies have focused on the verification and auditing of financial statements across public and private firms (e.g. Allee and Yohn (2009), Kim et al. (2011) and Minnis (2011)). For instance, Minnis (2011) finds that U.S. private firms that are audited face a lower cost of debt.

monitored by its creditors (e.g. through covenants) and hence will have greater incentives to report positive earnings (e.g. Dichev and Skinner (2002)).[5]

Lastly, we exploit the elimination of the inflation adjustment system in 2007 as a quasi-natural experiment to study how firms' reporting behavior changes following a change in accounting rules. In particular, we investigate whether firms with greater incentives to manage earnings are more likely to use discretionary accruals and/or real activities to report positive earnings after the removal of inflation adjustments in 2007. Specifically, using the pre-2007 period as a baseline, our quasi-natural experiment allows us to test whether the use of accruals and/or real activities manipulation increases in the post-2007 period. In doing so, we offer novel evidence on the "pecking order" of earnings management tools available to firms from a large emerging country economy. Additionally, similar to Zang (2012) and Cohen et al. (2008), this quasi-natural experiment provides insights as to whether reducing accounting flexibility can lead to potentially costlier earnings management practices.

We first find that when the inflation adjustment system is in place, firms avoid reporting small pre-tax losses by exercising considerable discretion in their use of inflation adjustments. Note that the following identity holds pre-2007: EBAT + IA = EBT. We exploit this simple relationship and show that although the scaled distributions of both EBAT and IA are continuous around zero, the distribution of EBT – the combination of these two smooth distributions – exhibits a significant discontinuity. This evidence is consistent with a large number of firms strategically using inflation adjustments to cross the zero-earnings threshold. We further show that the abnormally large number of firms reporting small pre-tax profits is directly tied to the greater use of inflation adjustments. Supporting the managerial discretion hypothesis, we find that the group of firms with small EBAT losses report significantly higher levels of inflation adjustments relative to the group of matched firms selected among those reporting a small EBAT profit.

To better understand the motives driving the observed accounting discretion in our sample of private firms, we split firms into two groups: firms with high (respectively low) reliance on bank debt financing, defined as being above (respectively below) the median total bank debt to assets. Consistent with the debt monitoring hypothesis, we find a significantly

[5] Naveen, Denis and Naveen (2008) find that public firms with bank debt manage earnings upwards in order to meet expected dividend-level thresholds.

greater use of IA for firms that rely *more* on bank financing relative to otherwise similar firms. Further, when examining the behavior of the subset of firms that report small losses before inflation adjustments, we find that those that manage to cross the zero-earnings threshold through their use of IA issue greater amounts of short-term debt in the year that follows, relative to a matched sample of firms that also have small EBAT loses but do not use IA to report positive pre-tax profits. Furthermore, we find that this difference in net debt issuance occurs only in the year *after* the reporting, and not during the reporting year when the information has not been publicly disseminated. This evidence suggests that continued access to external bank financing provides a potentially important incentive for private firms to manage their earnings. To the best of our knowledge, this is the first study to empirically identify this potential source of benefit resulting from earnings discretion among private firms.

Next, we analyze the period following the removal of the inflation adjustments system in 2007. Under the managerial discretion hypothesis, the incentives to report positive earnings remain. In fact, we show that the distributions of pre-tax earnings (EBT) are strikingly similar before and after 2007. However, as of 2007, firms wanting to report positive profits cannot use inflation adjustments to achieve their goal, and instead have to rely on other means to manage earnings. Following the rule change, we examine how the distributions of key line items in the income statement change in the post period relative to the pre-2007 period, and find that firms rely significantly more on non-operating revenues to go from small *operating* losses to positive pre-tax earnings (after IA are eliminated, Operating Earnings + Non-Operating Earnings = EBAT = EBT). We further explore this result and show that firms that move past the zero-operating earnings threshold through the use of non-operating items appear to do so at least in part by increasing the amount of asset sales after 2007 (see, for instance, Bartov (1993), and Herrmann et al. (2003)).[6] Ultimately, we find that firms adapt to the reduced flexibility afforded by the new reporting rules, and find other means to achieve their goals (e.g. Zang (2012) and Cohen et al. (2008)).[7] Given the increase in potentially costlier real activities (asset sales)

[6] Bartov (1993) and Hermann et al (2003) provide evidence on the timing of asset sales as a way to manage reported earnings.

[7] Zang (2012) studies the tradeoffs related to accruals manipulation vs. real activities manipulation. She uses the conventional model-based definitions of abnormal accruals and abnormal real activities. Her findings also have implications for whether a reduction in flexibility of GAAP accounting rules could lead to increases in real activities manipulation. Relatedly, Cohen et al. (2008) find that firms use more real activities manipulation following the passage of the Sarbanes-Oxley Act (SOX).

necessary to report positive earnings, our results also highlight a potential indirect cost of implementing a more restrictive reporting system. It appears that this trade-off, between greater benefits today (associated with achieving positive earnings) and greater costs in the future (in the form of suboptimal investment), might provide incentives for myopic managerial behavior (e.g., Narayanan (1985)).

Lastly, we examine a subset of conventional measures of earnings management in the pre vs. post 2007 setting and find no evidence of increased use of discretionary accruals or other real activities manipulation measures commonly used in the literature. However, the traditional approach based on an ex post definition of "suspect" firms (i.e. firms showing a small net profit (i.e. *after* potential earnings management)), and where abnormal behavior is estimated from a model of "normal" behavior, may lack power to detect earnings management. We argue that the conventional definition of suspect firms cannot distinguish between firms that actually did use their discretion to show positive earnings and those that did not need to use their discretion to show positive earnings. We highlight the potential lack of power of the ex post definition by applying it to the test of reporting discretion in non-operating revenues in the period after the elimination of the inflation adjustment system. Although we show a clear increase in the use of non-operating revenues when we define suspect firms as those showing a small operating loss; we do not find similar results when we partition our sample in suspect and non-suspect firms using the conventional ex post definition of suspect firms based on positive earnings before tax (EBT).

Our results are robust to several concerns raised in the literature. First, Beaver, McNichols, and Nelson (2007) show that discontinuities in after-tax measures of earnings are partially the result of income taxes and special items. In particular, firms with pre-tax losses have significantly lower effective tax rates than firms with a pre-tax profit, which in effect causes the distribution of firms with positive pre-tax profits to shift towards zero. We explicitly address this issue by focusing on pre-tax profit measures in all of our empirical tests. Second, Durtschi and Easton (2005, 2009) state that the observed discontinuities around zero can be affected by the variable used to normalize profits. To address this critique, we perform our baseline discontinuity tests without scaling our profitability measures and find similar evidence of strategic use of IA to manage earnings.

The paper proceeds as follows. In Section 2, we provide more institutional background to our setting. In Section 3, we develop our hypotheses and describe our empirical design. In Section 4, we provide details on our data. In Section 5, we present our main results. Section 6 concludes.

2. Institutional Background: Inflation Adjustments in Colombia

The main purpose of financial reporting is to provide information about the financial position and performance of a firm that is useful to a wide range of users in making economic decisions (Alexander and Britton, 2004). Most countries do not adjust their financial reporting rules or tax reporting requirements for inflation, mainly because low levels of inflation do not have a significant impact on the accuracy of financial statements, and implementing systematic adjustments for price level changes adds complexity to the reporting of firms. When inflation reaches non-negligible levels, however, financial statements without an appropriate adjustment for the effects of nominal price changes may incorrectly reflect the economic reality of firms. Unadjusted historic accounting may lead to a mismeasurement of the financial position and performance of the firm. As a result, income – for both financial reporting and tax calculations – may be distorted (see for instance Gordon (2001)).

Several countries including Brazil, Chile, Colombia, Israel, Mexico, Romania and Venezuela have implemented accounting procedures to adjust for the distortionary effects of inflation, (see for instance Thuronyi (1996)). In the U.S., the Securities and Exchange Commission introduced the Accounting Series Release (ASR) 190 in 1976 and the Statement of Financial Accounting Standard (SFAS) 33 in 1979 in response to the high levels of inflation observed in the early 1970s, although both are no longer effective.[8]

In Colombia, inflation adjustments were first introduced in 1986, in a context of inflation levels that averaged 22% between 1980 and 1985. Initially, only a firm's interest income and

[8] A strand of the literature has examined the market implications of inflation accounting in the U.S, mostly during the 1970s and 1980s (e.g., Beaver 1979; Beaver et al. 1980; Gheyara and Boatsman 1980; Ro 1980; Watts and Zimmerman 1980). These studies mainly focus on the effects of inflation and inflation-adjusted data on stock returns. As a whole, this literature concludes that there is no meaningful information content provided by inflation-adjusted data. More recently, Konchitchki (2011) shows that inflation adjustments, although not recognized in financial statements in the U.S., do appear to have economic consequences even during periods of low inflation.

interest expenses were indexed to price changes.[9] A broad and comprehensive inflation adjustments system – the "integrated inflation adjustments system (IIA system)" – was implemented in 1992.[10] The IIA system established a complete accounting structure for firms to adjust their financial statements, and its application encompassed both financial statements reporting and income tax calculations.

Law makers considered that the introduction of inflation adjustments allowed for more accurate financial and income tax reporting. In fact, the Government argued in the early 1990s that:

"The Colombian economy is being affected by inflation; nevertheless, the current set of financial reporting rules aimed at reflecting the economic reality of economic agents, mainly through its financial statements, does not take inflation into account. As a consequence, historic cost accounting has produced a deep distortion between the fiscal and economic reality of agents. In many cases, firms that did not have real profits but only nominal ones have paid income taxes on them, which results in unfair taxation to these firms and a gradual net worth loss by paying income taxes and distributing dividends when profits have not been real but only nominal. Conversely, there are also firms that have obtained real profits and, because of historical cost accounting, have not reported them and have not paid income taxes on them".[11]

The IIA system consisted in adjusting for inflation the value of non-monetary balance sheet items. Non-monetary items were defined by the Colombian tax revenue agency (*Dirección de Impuestos y Aduanas Nacionales*, DIAN) as those that maintain their economic value and thus are susceptibleto have their nominal value increase as general prices in the economy rise (see Orduña (2004)). Table A1 in the appendix shows how different balance sheet items were classified under the IIA system as monetary (not subject to adjustments) and non-monetary (subject to adjustments).[12] On the assets side, for instance, the following were considered non-monetary items for inflation adjustments purposes: inventories, deferred charges, fixed assets, accumulated depreciation, long term investments in other companies, intangible assets (those resulting from a purchase transaction). For shareholders' equity the following were subject to

[9] Law 75 of 1986. In addition to adjusting for inflation interest income and expenses, Law 75 provided the Government of Colombia with faculties to further specify law changes to mitigate the effects of inflation on financial reporting and taxable income.

[10] Law 49 of 1990. Several decrees and laws made adjustments up until 2002 (decree 1744 of 1991, decrees 2911 and 2912 of 1991, decree 2075 of 1992, decree 2591 of 1993, decree 301 of 1994, law 174 of 1994, law 223 of 1995, law 488 of 1998 and law 788 of 2002).

[11] Law 49 of 1990. Translation made by the authors.

[12] Under Law 1314 of 2009, the Colombian Government announced that the local GAAP accounting standards – adopted by Decree 2649 of 1993 – would be replaced by IFRS starting in 2015.

adjustments: capital, excess capital, legal reserve, revaluation reserve and retained earnings.[13] Inflation adjustments were recorded in separate lines on the balance sheet for each of those affected items. Their net effect on income was recorded in the income statement as "inflation adjustments", which importantly was reported as a separate line item below earnings before adjustments and taxes (EBAT) and above earnings before taxes (EBT). That is, in the income statement, the following identity holds EBT = EBAT + IA.[14]

The inflation factor used to adjust financial statements was defined as the percentage change in the consumer price index published by Colombia's National Administrative Department of Statistics (*Departamento Administrativo Nacional de Estadística*, DANE) between December 1st of the previous year and November 30th of the reporting year. Importantly however, if transactions occurred within a year and affected non-monetary items, appropriate individual adjustments reflecting a more meticulous timing was required. In those cases, adjustments were made for those specific items using the monthly inflation reported by Colombia's statistics agency DANE, reflecting the specific timing of their occurrence. This within-year adjustments were for instance commonly applied for inventories, often involving a large number of different adjustments, even for one given product (e.g. if different units were bought/sold at different times in the year). This added a high level of complexity to the actual implementation of the adjustments and, due to the difficulty in overseeing the accuracy of such an intricate process, likely resulted in a non-trivial degree of managerial discretion. This intricacy is further reflected in the fact that there were more than 80 different balance sheet sub-accounts related to inflation adjustments at the end of 2006. To wit, McLure (1990) argued that "the types of inflation adjustment required for the accurate measurement of real income from capital are quite complicated […] This is demonstrated to some extent by the inflation adjustment provisions under current Colombian law."

[13] The adjustment to shareholders' equity represents the purchasing power loss in the capital provided by shareholders, independent of the assets purchased with that capital. If the capital provided is invested in monetary assets, then the equity adjustment loss is consolidated in the income statement. If on the other hand the invested capital corresponds to non-monetary assets, then the shareholders' equity adjustment loss is compensated by an adjustment gain on the assets side. To illustrate the mechanics of these inflation adjustments, we provide an example in Appendix Table A2.

[14] From our data we only observe the net effect of IA in the income statement, not the individual components throughout the balance sheet.

After being in place for more than a decade, inflation adjustments for both fiscal and financial reporting purposes were completely eliminated in Colombia in 2007.[15] One of the key reasons stated by Government officials for the elimination of the IIA system was the low levels of inflation that had been achieved since the early 2000s. Annual inflation was 4.3% in 2006 and 5.5% in 2007, just above the Central Bank's long term target of 4%. As a consequence of the stabilization of prices, the potential benefits of the IIA system significantly declined, making it hard to justify the added complexity inherent in such accounting adjustments. At the onset of their elimination an important accounting news outlet in Colombia described that inflation adjustments had had a "tortuous history", and that while in place "they had resulted in a high level of complexity due to their technicality."[16]

3. Hypotheses Development and Methodology

We first focus on the distributional properties of key accounting items derived from a comprehensive set of Colombian firms, to test whether there is large-scale evidence of managerial accounting discretion before and after the elimination of the IIA system.

3.1 Hypotheses Development

Starting with Hayn (1995), Burgstahler and Dichev (1997) and Degeorge, Patel, and Zeckhauser (1999), the literature has empirically tested the "loss avoidance" hypothesis. Under the null of managerial discretion around the zero-earnings threshold, managers whose firms are showing small losses have a strong incentive to use their accounting discretion to show a small profit instead. This behavior results in a large discontinuity of the earnings distribution around the zero-earnings threshold. By being able to observe a line item, inflation adjustments, with considerable discretion just above earnings before taxes, we can investigate whether firms that show a small loss *before* inflation adjustments use this item to report positive earnings (managerial discretion hypothesis).[17]

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[15] Law 1111 of 2006, passed on December 26th, first eliminated inflation adjustments for income tax calculations starting in 2007. Decree 1536 of 2007, passed on May 7th, retroactively eliminated inflation adjustments for financial reporting also starting in 2007.

[16] http://actualicese.com/actualidad/2007/05/10/y-la-pelicula-llego-a-su-final-se-eliminan-oficialmente-los-ajustes-por-inflacion-con-fines-contables/. Translation made by the authors.

[17] Our hypothesis does not preclude the fact that firms in our sample may already be using their accounting discretion prior to inflation adjustments to bring their earnings closer to the positive earnings threshold.

There are multiple reasons for managers to avoid reporting a loss. Behavioral theories, in particular loss aversion, are put forward to justify why managers may be incentivized to report positive earnings. Further, earnings thresholds are often used in the context of monitoring between principal and agents (monitoring hypothesis). For instance, both bank loan covenants and managerial compensation are often directly tied to reported earnings. Detailed balance sheet information allows us to test whether firms relying more on bank financing make greater use of inflation adjustments to report positive earnings, after controlling for differences in firm characteristics.[18]

Importantly, inflation adjustments were removed from financial reporting in Colombia as of 2007. Under the managerial discretion hypothesis, the incentives to show positive earnings remain, even after inflation adjustments have been eliminated. In that case, firms must employ other means to avoid having to report a loss. Managerial discretion can take several forms, including accruals manipulation, real activities manipulation and non-operating items manipulation. The hypotheses put forward above have several testable implications:

H1a (pre-2007): Under the managerial discretion hypothesis, the distribution of pre-tax earnings (EBT), i.e. pre-tax earnings *after* inflation adjustments, shows a significant discontinuity around zero.

H1b (pre-2007): Under the managerial discretion hypothesis, the discontinuity under H1a is reflected in significant differences in the inflation adjustments (IA) distributions for the set of firms just *below* the zero-earnings before inflation adjustments and taxes (EBAT) threshold relative to those just above.

H2 (pre-2007, cross-sectional): Under the monitoring hypothesis of earnings discretion, we expect a *greater use* of inflation adjustments for firms with *high exposure* to bank debt *within* the set of firms just *below* the zero-earnings before inflation adjustments and taxes (EBAT) threshold.

H3a (post-2007): Under the managerial discretion hypothesis, the distribution of earnings before taxes (EBT) still exhibits a discontinuity around the zero-earnings threshold, even after inflation adjustments are no longer available to managers.

[18] Our hypothesis is indirectly related to the debt covenant hypothesis (see Dichev and Skinner (2002)). Although we do not have loan covenant data, we are implicitly assuming that some of the contracting terms between the firms and their bankers (covenants or otherwise) are based on accounting numbers such as earnings.

H3b (post-2007): Under the managerial discretion hypothesis, and following the elimination of inflation adjustments, Colombian firms resort to other earnings management mechanisms (e.g. accrual or real activities manipulation) in order to avoid having to report an earnings loss.

3.2 Methodology

In this subsection, we provide details on the methodology we implement in this study. We first review the earnings measures we use. We then develop the statistical tests we employ to gauge the degree of managerial discretion in our data.

3.2.1 Earnings Measures

Beaver, McNichols and Nelson (2007) caution that a discontinuity in the distribution of after tax net income can arise from the non-discretionary nature of some of its components. In particular, given the non-continuous nature of the annual income tax payment reported by firms, the distribution of after tax net income can have a naturally occurring discontinuity around zero, even when there is no earnings manipulation by firms. Their findings imply that to evaluate the presence of earnings management through the distribution of earnings, we need to use *pre-tax* profitability measures. Hence, we focus on the following two pre-tax earnings measures: 1) earnings before inflation adjustments and taxes (EBAT) and 2) earnings before taxes (EBT). A key feature of our empirical design is that three consecutive line items in the income statement allow us to test the distributional implications of our hypotheses. Specifically, note that EBAT + IA = EBT.

Durtschi and Easton (2005) highlight that deflation of earnings measures (normalizing by beginning of period stock price) can help explain the kink in the distribution as markets do not price profitable firms in the same way as they do unprofitable firms. We do not suffer from this issue in our setting as we deflate by beginning of period total assets. We also do not suffer from the sample selection issues mentioned in their study given that we do not use stock price data of unprofitable firms in our sample.

3.2.2 Inflation adjustments, discretionary accruals and real activities manipulation

The discretionary nature of accruals and other accounting items is notoriously difficult to gauge empirically. The issue lies in the fact that researchers need to develop a model to assess actual behavior from "normal" behavior and hence may suffer from a lack of power if their model is misspecified (see, for instance, Dechow et al. (2003)).

A key advantage of our empirical framework is given by the fact that firm-level inflation adjustments are directly observable as a separate line item in the income statement, directly above earnings before tax in our sample of firms. As described in detail in Section 2, these inflation adjustments afford considerable discretion to management. Our setting allows us to use large sample properties around the zero-earnings threshold to test whether firms that show a slight loss use this line item differently than firms showing a small profit before inflation adjustments.

Following the removal of the inflation adjustment system in 2007, we resort to a subset of conventional measures of discretionary reporting used in the literature. In particular, we explore the behavior of: discretionary accruals, real activities manipulation through abnormal CFO, abnormal production costs and abnormal discretionary expenses (see Appendix I for detailed variable definitions). All these measures require a model-based measure of "normal" behavior (i.e. estimating normal accruals from a regression model) to estimate abnormal behavior as the difference between observed and model behavior (i.e. abnormal accruals = observed accruals minus normal accruals).

In addition to these model-based measures, we explore the use of non-operating revenues, which can also be used by firms to manage earnings and are observable in our data.[19] Non-operating revenues includes income not related to the typical activities of the business or organization. It is comprised of gains from investments, financial transactions, property or asset sales, recoveries and other gains.

3.2.3 Suspect firms

Prior to 2007, our empirical design focuses on the discretionary nature of inflation adjustments (IA). Since IA are reported as a line item directly above EBT, our framework allows us to cleanly identify *ex ante* the firms with incentives to manipulate IA upwards to show

[19] For instance, Bertrand, Mehta, and Mullainathan (2002) show that Indian firms use mostly non-operating items to tunnel profits across different divisions.

positive EBT. Under the managerial discretion hypothesis, those firms are the ones with a small reported *loss* before inflation adjustments and taxes (i.e. a small, negative EBAT). We compare the distribution of their reported inflation adjustments to the distribution from the set of control firms defined as firms reporting a small *profit* before inflation adjustments and taxes (i.e. a small, positive EBAT).

This approach provides a significant methodological advantage over the typical study that rely on an ex post measure of "suspect" firms. For instance, Roychowdhury (2006) defines suspect firms as those that report small, positive EBT and compares their reporting and real cash flow behavior to the control group of firms reporting a small, negative EBT. This ex post definition of suspect firms, however, cannot distinguish between firms that actually did use their discretion to show a positive EBT and those that did not need to use their discretion to show a positive EBT. We will use our empirical setup to gauge the power of this ex post definition of suspect firms.

3.2.4 Discontinuity tests

Degeorge et al. (1999) introduce earnings management threshold tests based on the examination of discontinuities in the distribution of observed earnings. We focus on the zero-earnings threshold, which is induced by manager's incentive to report positive profits under the managerial discretion hypothesis (see hypotheses H1a and H3a). We compute the following *t*-test to evaluate the significance of a discontinuity around the zero-earnings threshold in the empirical distribution of earnings:[20]

$$\tau_n = \frac{\Delta p_n - \ mean\ [\Delta p(x_i)]}{\text{St. Dev.}\ [\Delta p(x_i)]}$$

where Δp_n is the probability density of interval *n*. The parameters $mean\ [\Delta p(x_i)]$ and $\text{St. Dev.}\ [\Delta p(x_i)]$ denote, respectively, the mean and standard deviation of the differences between the probability densities of each pair of neighboring intervals around interval *n* and *n-1*. Under the null hypothesis that $\Delta p(x_i)$ approximately follows a Gaussian distribution, τ_n is well

[20] We follow the notation in Degeorge et al (1999) and Coppens and Peek (2005).

approximated by Student's *t*-distribution.[21] To implement this test we take into account the location of the peak of the distribution relative to the zero-earnings threshold.[22]

There are two important differences in our test relative to both Degeorge et al (1999) and Coppens and Peek (2005): first, we focus our analysis on pre-tax measures of earnings, which explicitly avoids the discontinuity around zero that is due to taxation and other potentially discontinuous non-discretionary items (see Beaver et al. (2007)). Second, we calculate our *t*-statistics using *all* bins around the zero-earnings threshold; both Degeorge et al (1999) and Coppens and Peek (2005) exclude the zero-earnings bin from the test, which facilitates finding a discontinuity more often than not.[23]

3.2.5 Regression Analysis prior to 2007

We first focus on the time period when inflation adjustments are in place. We augment the discontinuity tests described above with regression analyses. The regression models allow us to estimate potential differences in reporting behavior between firms just above (small profit) and firms just below (small loss) the zero EBAT threshold in a multivariate setting.

The regression model allows testing of H1b while controlling for the potential impact of differences in firm characteristics across the small profit and small loss firms. In a first step, we select all firms in the vicinity (above and below) the zero EBAT threshold. Specifically, we define "Small loss firms" as those with earnings before inflation adjustments and taxes between -2.5% and 0% of total assets.[24] "Small profit firms" have scaled EBAT between 0% and +2.5% and are matched to the sample of "small loss firms" using a one-to-one nearest neighbor matching estimator with replacement.[25] Matching is performed so that every firm-year is

[21] Following the recommendation of Holland (2004), we partition the data using different interval sizes to make sure our results are robust to the somewhat arbitrary decision of the frequency at which the data is sliced.

[22] As Degeorge et al (1999) point out, the *t*-statistic is "satisfactory as long as the point at which the density being examined for a discontinuity (T) falls significantly on one side of the peak of the probability density distribution." In our tests we take into account the empirical fact that the peak of the distribution of EBT is found to the right of zero (when using our benchmark bin width of 0.0025, the bin with the largest density lies between +0.0125 and +0.015).

[23] Degeorge et al (1999) acknowledge that excluding the zero-profits bin allows to increase the power of the test: "We exclude observations corresponding to $i = n$ in the computation of the mean and standard deviation to increase power in identifying a discontinuity".

[24] These results are robust for instance to using narrower or wider windows (e.g. 2.0% or 3.0%) of scaled assets cutoff instead of 2.5%.

[25] We choose to match with replacement as it allows for better matches and less bias, at the expense lower power. Relative to matching without replacement, allowing for replacement has the added advantage that estimates do not

matched to the firm-year in its industry that has the closest propensity score based on the following firm characteristics: size, age, leverage, capital expenditures and asset tangibility.[26] Since IA are eliminated in 2007, only data before 2007 are used in these tests. We then run the following regression:

$$IA_{it} = \alpha + \beta_1 Dummy\ Small\ Loss\ EBAT_{it} + \delta X_{it} + \sum_j \varphi_j IND_{j,i} + \sum_s \gamma_s YEAR_{s,t} + \varepsilon_{it} \quad (1)$$

where the indicator variable *Dummy Small Loss EBAT* takes a value of one if a firm has a small loss, defined as scaled EBAT within [-2.5%; 0%] in a given year, and a value of zero for firms with a small profit, defined as scaled EBAT within [0; +2.5%]. The coefficient β_1 tests for a differential use of IA for firms "just below" versus "just above" the zero-EBAT threshold (hypothesis H1b). Beyond the matching exercise described above, we further control for remaining differences in firm characteristics by including several firm-level controls (X_{it}) as well as industry ($IND_{j.i}$) and year ($YEAR_{s,t}$) fixed effects. Standard errors are clustered by firm.

To further investigate the discretionary use of IA in the cross-section of private firms prior to 2007, we run the following cross-sectional regression:

$$\begin{aligned} IA_{it} = \alpha &+ \beta_1 Dummy\ Small\ Loss\ EBAT_{it} + \beta_2 Dummy\ High\ Bank\ Lev._{it} \\ &+ \beta_3 (Dummy\ Small\ Loss\ EBAT_{it} \times\ Dummy\ High\ Bank\ Lev._{it}) \\ &+ \sum_j \varphi_j IND_{j,i} + \sum_s \gamma_s YEAR_{s,t} + \delta X_{it} + \varepsilon_{it} \end{aligned} \quad (2)$$

The additional indicator variable *Dummy High Bank Lev.* takes a value of one (zero) if a firm has a ratio of bank debt to total asset above (respectively below) the median bank debt to total asset ratio for the full sample in any given year. The interaction term *Dummy Small Loss EBAT* × *Dummy High Bank Lev.* is included to test whether firms with more bank debt are more likely to use IA to show positive earnings (see hypothesis H2). Small loss firms are matched to

depend on the order in which observations are matched (see, for instance, Smith and Todd (2005) and Roberts and Whited (2012)).

[26] We incorporate industry indicator variables in the propensity score matching probit model to absorb any time-invariant characteristics not absorbed by the firm characteristics. For the matching procedure we define industry by ISIC at the section level. This level of granularity generates 13 industry classifications (see Appendix Table A3).

small profit firms using the same propensity score matching technique described above. We further control for remaining differences in firm characteristics by including several firm-level controls (X_{it}) as well as industry and year fixed effects.

3.2.6 Regression Analysis Comparing Firms' Response before and after 2007

Inflation adjustments were eliminated in Colombia in 2007. As such, firms wanting to use their reporting discretion have to resort to the discretionary use of accruals and/or real activities as of 2007. To test whether and how managers use their discretion in accruals and real activities before and after the elimination of the IIA system (hypotheses H3a and H3b), we estimate the following regression model:

$$\begin{aligned} EMM_{it} = \alpha + \beta_1 Suspect\ Firm_{it} + \beta_2 Dummy\ Post\ 2007_t \\ + \beta_3 (Suspect\ Firm_{it} \times Dummy\ Post\ 2007_t) + \sum_j \varphi_j IND_{j,i} \\ + \sum_s \gamma_s YEAR_{s,t} + \delta X_{it} + \varepsilon_{it} \end{aligned} \quad (4)$$

For each specification, we define the dependent variable to be a different earnings management measure (EMM_{it}), such as abnormal accruals and real activities manipulation. *Dummy Pre 2007* takes a value of one (zero) for every firm-year observation before (after) the elimination of inflation adjustments in 2007. The interaction term *Suspect firm* × *Dummy Pre 2007* is included to test for differences in the use of earnings management mechanisms across suspect and non-suspect firms before and after the elimination of inflation adjustments. A positive coefficient on the interaction term would be consistent with hypothesis H3b. We control for differences in firm characteristics by including several firm-level controls (X_{it}) as well as industry and year fixed effects.

As discussed previously, when focusing on abnormal accruals or real activities manipulation, there does not exist a set of firms with clear ex ante incentives to manipulate along these reporting dimensions. Rather, as in Roychowdhury (2006), we define "suspect firms" as those that are able to report positive earnings before tax (see Appendix I for details on the definition of measures of accounting discretion). Specifically, a firm-year observation is flagged as "suspect" if the firm was able to report a small profit before taxes (EBT) for that year (scaled

EBT within [0%; +0.5%]). The control sample consists of firms reporting a small loss before taxes (EBT) in the same year (scaled EBT within [-1%; 0%]).

However, we augment these traditional measures of abnormal accruals and real activities manipulation by looking at key measures of profit margins, namely operating margin and pretax income margin. The line item between the two items is non-operating revenues (that includes items such as gains on asset sales). In doing so, we can recover a similar empirical advantage to our main test: We can define ex ante which firms have the most incentives to use their discretion in non-operating revenues, i.e. those reporting a small *operating loss*. As such, note that in this case, the dummy variable indicating "suspect firms" in equation (3) is defined *ex ante* by those exhibiting a small operating loss. Specifically, the dummy variable takes a value of one if a firm has a small operating loss (defined as scaled operating profit within [-2.5%; 0%]) in a given year and a value of zero if a firm has a small operating profit (scaled operating profit within [0%; +2.5%]).[27]

4. Data

Our firm-level data is based on accounting information collected by Colombia's Corporations Superintendence (*Superintendencia de Sociedades*), a government agency in charge of overseeing privately held corporations. The accounting information available covers private firms that meet one of a set of conditions defined by law.[28] In order to have a dataset both before and after inflation adjustments are removed, our sample is comprised of annual data between 2003 and 2010. Focusing on this period allows us to examine firm behavior for four years before and after the elimination of inflation adjustments.

We drop utilities (ISIC codes 40 and 41) and financial firms (ISIC codes 65 to 67) from the sample. We exclude very small firms with less than COP 100 million in assets

[27] Small operating loss firms have been matched to small operating profit firms using a propensity score matching technique similar to the one described above but in this case applied to operating earnings instead of EBAT.

[28] Law 222 of 1995 established the obligation to prepare, submit and make public through the Superintendence the financial statements of all private firms meeting a set of eligibility conditions. These conditions include thresholds for annual sales, total assets and ownership by other corporations, among others. There have been modifications to the inclusion criteria which have resulted in jumps in the number of observations per year in the raw data, as shown in Table 1. Just as important, starting in 2006 the Superintendence set out to collect information from all companies registered in its database, irrespective of their eligibility status. As a result of this effort, there is a significant increase in the sample size starting in 2006, as seen in Table 1. We explicitly address potential concerns related to changes in sample size through time by using a matched sample in our regression based tests.

(approximately USD 40,000), and firm-years for which annual asset or sales growth is larger than 100 percent.[29] As a result, our final sample is comprised of 103,402 firm-year observations, corresponding to 25,803 distinct firms between 2003 and 2010.

[Insert Table 1 here]

Table 1 provides mean values for several firm characteristics by year, for the years prior to 2007 (with the IIA system in place), for the years since 2007 (after the elimination of the IIA system), and for the full sample in the last row.[30] The mean firm size over the entire sample period, as measured by total assets, is equal to COP 19 billion (approximately US$8.8 million) and is relatively stable over time.[31] The average firm age is equal to slightly more than 19.4 years. Total leverage equates 30.3% of assets and is stable over time; bank debt averages 13.1% of total assets and is also stable over the sample period. ROE is equal to 6.0% over the entire sample with higher average values post-2007. Scaled earnings before taxes (EBT) are also higher on average in the second half of our sample period. The inflation adjustments line item corresponds on average to 0.25% of total assets until their removal in 2007. Finally, at the macro-level, consumer inflation is in the single-digit levels during our sample period, averaging 5.2% per year.

5. Results

5.1. Discontinuities in the Distribution of Scaled Earnings and Inflation Adjustments

5.1.1 Graphical evidence

We start by providing graphical evidence on our first hypothesis of managerial discretion in Figures 1 and 2. Figure 1 plots the scaled distributions of the following three consecutive income statement item lines: (1) scaled earnings *before* inflation adjustments and taxes (EBAT), (2) inflation adjustments (IA) and (3) earnings *after* inflation adjustments and before taxes (EBT). While the distributions of EBAT and IA (top and middle chart respectively) do not show

[29] We apply these filters on assets by indexing all accounts to 2010 price levels.

[30] Table A3 in the Appendix further provides details on the composition of the sample by industry segments using ISIC section-level definitions.

[31] There is a drop in firm size in 2006 when the Corporations Superintendence relaxed the minimum firm size criteria. The matching technique we implement in our tests, which includes size as a covariate, directly addresses concerns that this change in the reporting criteria could be affecting our results.

any visible jump in their distributions, the distribution of EBT = EBAT + IA (bottom chart) shows a clear discontinuity at the zero earnings threshold. Beaver, McNichols and Nelson (2007) caution that a discontinuity in the distribution of earnings can arise from the discontinuous nature of some of its components; in Figure 1, we show that the discontinuity in EBT is *not* the result of a potentially discontinuous nature in the two variables that generate it, as the distributions of EBAT and IA appear to be continuous around zero. The discontinuity in EBT emerges from combining two continuous distributions, EBAT and IA, which strongly suggests that there is an active and strategic use of inflation adjustments – the only item line between EBAT and EBT – in order to cross to the positive side of reported pre-tax income.

[Insert Figure 1 here]

To further buttress this point, in the bottom chart of Figure 1 we also show the simulated distribution of EBT that would be obtained using simulated draws of EBT by summing up random draws from the actual EBAT and IA distributions, assuming a correlation of -0.22 (equal to the in-sample correlation between the two). We perform the simulation by drawing 10,000 bootstrap samples of the observed distributions of EBAT and IA. The resulting simulated distribution for EBT, shown in the bottom panel using a red line, is significantly smoother than the actual distribution of EBT, and shows no discontinuities in the vicinity of the zero-earnings threshold. Simply put, this simulation exercise shows that the combination of the two continuous distributions, absent manipulation, should generate another continuous distribution.[32]

[Insert Figure 2 here]

Figure 2 partitions further the distribution of inflation adjustments by EBAT bins over the pre-2007 period (2003 to 2006). Specifically, it plots the distribution of IA for each EBAT bin of 2% in the [-20%; +20%] range, with the bar highlighted in dark blue containing the median of each distribution. While the distribution range of inflation adjustments is fairly large within each bin, the pattern of dark blue bars clearly shows an overall increase in the use of IA for firms

[32] Following Durtschi and Easton (2005)'s critique, Figure A1 in the Appendix plots the "unscaled" distributions for EBAT, IA, and EBT. Reassuringly, the distribution patterns are similar to their scaled counterparts. That is, Figure A1 offers evidence that scaling issues are not driving our results.

showing small EBAT losses (to the left of the zero-earnings threshold) relative to firms showing a small EBAT profit.

The findings of Figure 1 and 2 depict a consistent pattern of behavior among our sample firms. In particular, the discontinuity at zero for the distribution of EBT in Figure 1 supports H1a. Further, the significant upward shift in the distributions of IA for firms showing a small loss before inflation adjustments in Figure 2 supports H1b: inflation adjustments seem to be used opportunistically to report positive pre-tax earnings.[33]

5.1.2. Statistical tests of discontinuities

Table 2 provides formal statistical tests for discontinuities in the distribution of earnings before and after inflation adjustments. Following the literature (e.g. Degeorge et al. (1999), Coppens and Peek (2005)), we compute a t-test for the significance of a discontinuity around the zero-earnings threshold in the empirical distribution. The results in Table 2 confirm the graphical evidence of Figure 1: while the distribution of EBAT does not show a significant discontinuity in the vicinity of zero, the distribution of EBT exhibits a statistically significant discontinuity exactly at the zero-earnings threshold (see row for the "0% to 0.25%" bin in Table 2).

[Insert Table 2 here]

With a frequency of 1.44% (and a corresponding t-statistic of 3.36), the proportion of firms showing earnings in the [0; +0.25%] range is significantly larger than the proportion of firms in the neighboring bins. In particular, the bin just below the zero-EBT threshold has a frequency of only 0.80% or about half as much as the proportion of firms in the first bin showing positive EBT. These empirical findings are consistent with the prediction of hypothesis H1a.

5.2 Small loss firms vs. Small profit firms

Hypothesis H1b states that firms exhibiting a small negative EBAT use the discretionary nature of the inflation adjustment line item to report positive EBT. To provide a formal test of

[33] Figure 2 also highlights that inflation adjustment rules allow Colombian firms to adjust EBAT both upwards and downwards. For all bins with scaled earnings above 6%, the median value for IA is negative. This negative value means that the median firm in those bins has a lower earnings before taxes (EBT) that if it did not use inflation adjustments. Tax motives could be a possible driver for this finding.

this hypothesis, we consider firms with small negative pre-adjustment earnings, EBAT, ("small loss firms") as treatment firms and compare their behavior to a set of control firms that exhibit a small positive EBAT ("small profit firms"). Small loss firms report a scaled EBAT in the [-2.5%; 0%] range and the small profit firms are selected from those reporting a scaled EBAT in the [0%; +2.5%] range, and then matched one-to-one to small loss firms using a propensity score matching procedure with replacement to remove any meaningful differences along observable characteristics for the two groups of firms.

[Insert Table 3 here]

The first three columns in Panel A of Table 3 (pre-match) illustrate why we undertake a matching approach when comparing firms with small EBAT losses relative to those with small EBAT profits. These columns present mean values along several firm characteristics and t-statistics of the differences across these two groups. Overall, small loss firms (treatment) show significant differences relative to small profit firms (untreated) on several dimensions. Thus, a direct comparison of these two groups cannot be made without controlling for these differences.

The last three columns in Panel A of Table 3 report the results of our matching procedure. They present summary statistics and t-tests of differences in means along all firm characteristics used in our matching procedure. It is clear from these results that the matching estimator has removed any meaningful differences between the two groups of matched treatment and control firms. For all firm characteristics, the average values across the two groups are similar and none of the t-tests for the differences in means is statistically significant at less than the 1% level. The results of the matching process are a treatment and control group with 2,832 firm-year observations each, consisting of 2,250 unique treatment firms and 1,710 distinct control firms.[34]

In contrast, Panel B of Table 3 highlights stark differences in terms of EBAT, IA and EBT. First note that, by construction, scaled EBAT is significantly lower for the small loss firms relative to the small profit firms (because our definitions of "small loss" and "small profit" firms are precisely based on this measure). More interestingly, scaled inflation adjustments are

[34] Out of the 2,250 unique small loss firms in the treatment group, 1,795 report small EBAT losses in one year, 349 firms do it in two years, 85 firms in three and 21 firms report small losses in four different years.

significantly higher for the small loss firms at 1.22% of assets, almost twice as large as for the small profit group. And while the difference in scaled EBT is still statistically significant between the two groups, the difference is significantly reduced due to the greater use of inflation adjustments made by small loss firms. Of note, small-EBAT loss firms show on average scaled EBAT of -1.05%, yet exhibit, as a group, average earnings *after* inflation adjustments and before taxes (EBT) that are positive and equal to +0.17%. Consistent with the graphical evidence found in Figure 2, the results from the statistical tests shown in Table 3 are supportive of hypothesis H1b: firms with small EBAT losses appear to strategically use inflation adjustments to report positive EBT.

5.3 Regression Analysis for Inflation Adjustments

In this section, we extend our initial statistical tests to a multivariate setting using regression analysis. Table 4 reports the estimates of Eq. (1) which tests for the discretionary use of IA. The dependent variable is scaled inflation adjustments. Using the matched sample of firms described in the previous section, we contrast the use of IA between firms that exhibit a small-EBAT loss and those with a small-EBAT profit by including an indicator variable for small loss firms. Column (1) reports the baseline regression with no additional control variables or fixed effects, while columns (2) to (4) add firm-level covariates, industry fixed effects and year fixed effects.

[Insert Table 4 here]

The coefficient β_1 on *Dummy Small Loss EBAT* is statistically significant in all three specifications of Table 4. The economic magnitude is consistent with those reported in Table 3: small loss firms report scaled inflation adjustments that are 41 to 44 basis points above what is reported on average by small profit firms.[35] This magnitude, which on average is slightly more than 50% greater than what is reported by small profit firms, remains very similar across all specifications and hence does not appear to be driven by differences in firm characteristics across the two groups of firms, or by industry or time fixed effects. It is important to note that firms

[35] In fact, results in column 1 of Table 4 are the regression form equivalents of the matched sample mean values reported in Table 3, panel B.

with more external financing and more fixed assets have higher inflation adjustments, which highlights the importance of our matching procedure and for controlling for firm characteristics when testing for the differential use in inflation adjustments. Overall, the evidence from Table 4 offers strong support for hypothesis H1b: i.e. firms seem to use strategically their discretion in inflation adjustments in order to report positive pre-tax earnings.[36]

5.4 Bank Dependence and Reporting Discretion

5.4.1 Cross-sectional Tests

We now turn our attention to the monitoring hypothesis H2, which posits that the use of inflation adjustments should be greater for firms with *more* exposure to bank debt. Table 5 reports the estimates of regressions exploring the differential use of inflation adjustments to cross the zero-earnings threshold depending on firms' bank debt exposure. The dependent variable is scaled inflation adjustments. As before, we contrast the use of IA between our matched sample of firms that exhibit a small EBAT and those with a small positive EBAT by including an indicator variable for small loss firms. We further allow for differences in the use of IA between firms that are bank dependent vs. non-bank dependent by including an indicator variable for firms with bank debt levels above the median bank debt level in our sample. The interaction term of these two indicator variables tests for a differential use of IA *within* small loss firms based on their exposure to bank debt.

[Insert Table 5 here]

Column (1) of Table 5 reports the baseline regression without control variables or fixed effects. Column (2) adds and industry and time fixed effects, column (3) includes controls, and column (4) includes controls, industry fixed effects and time fixed effects. Relative to the set of

[36] In Table A4 in the Appendix we explore whether the differential use of IA among small loss and small profit firms can be explained by heterogeneity in the requirement to have an auditor (see Minnis (2011)). Article 203 of Colombia's Commerce Code (*Código de Comercio*) requires all anonymous corporations and firms with sales in the preceding year above the equivalent of 5,000 minimum monthly wages to have audited financial statements. Limited liability corporations, limited liability partnerships, simplified stock companies, and collective corporations that have sales in the preceding year below the equivalent of 5,000 minimum monthly wages are *not* required to have an auditor. Approximately 66% of our firm-year observations are related to firms that require audited financial statements. Across all three specifications in Table A4 (equivalent to the three models reported in table 4) we find no clear evidence that the requirement to have audited financial statements is driving our results one way or another.

covariates used in Table 4, we add in this specification a control for asset tangibility interacted with the small EBAT loss dummy. Almeida and Campello (2007) show that high tangibility is related to greater external financing. Hence, controlling for high tangibility ensures that high bank dependence does not proxy for high asset tangibility, which in turn might also be directly related to a greater use of inflation adjustments. We thus define a high asset tangibility dummy (above median fixed assets) and interact this term with the small loss indicator variable in columns (3) and (4).

The coefficient β_3 on the interaction term *Dummy Small Loss EBAT* × *High Bank Lev* is statistically significant in all four specifications of Table 5 with a magnitude of approximately 0.19 to 0.25% of assets. This means that even after controlling for time and industry fixed effects and firm-level controls, companies that are more bank dependent among those reporting a small loss before inflation adjustments inflate their earnings significantly more than non-bank dependent firms. This result offers strong support for the monitoring hypothesis (H2), and suggests that bank debt monitoring plays an important role in incentivizing private firms to report positive earnings.

5.4.2 Earnings Discretion and Patterns of Future Debt Issuances

Since the cross-sectional analysis suggests that bank incentives play an important role in the earnings management behavior of our sample firms, we now exploit our empirical setting to test whether there are identifiable financing-related benefits associated with managing earnings through the use of IA.

First, we show in Figure 3 the mean net bank debt issuance in year *t+1* for firms that were below and above the zero-earnings (EBT) threshold at year *t*, while the IIA system was in place. It provides strong graphical evidence that the issuance of bank debt is discontinuous at the zero earnings threshold; specifically, reporting positive EBT at time *t*, even if small in absolute terms, is associated with relatively higher levels of bank debt issuance at time *t+1*. It is worth noting that, because by construction Figure 3 is comparing the net issuance of debt for firms with negative vs. positive EBT, we cannot ascribe any causal relationship from it.

[Insert Figure 3 here]

However, we build on this graphical evidence and exploit our empirical setting to try and identify whether there is a debt-issuance benefit related to earnings management. We do this formally using regression analysis on a newly matched sample of treatment and control firms. Our starting point is to focus on the subsample of firms that have negative EBAT. All observations included in these tests are firms that report negative scaled EBAT between -5% and 0% of beginning of the year assets (Figure A2 in the appendix depicts this subsample in terms of the distribution of EBAT).[37]

Using this matched sample, we then test whether firms that use IA to move beyond the zero-earnings threshold (i.e. report positive EBT *after* reporting negative EBAT) show different debt issuance patterns in the following year, relative to a control group of firms that, importantly, also reported negative EBAT but did not report a positive EBT; in other words, the only difference between the two groups is a higher reported value of inflation adjustments. To obtain our control group, we implement a matching procedure similar to the one employed in Table 3 (results of the matching procedure are reported in Table A5 in the Appendix). We include a similar set of firm characteristics but importantly add EBAT as an additional matching variable to ensure that treatment and control firms do not have different profitability levels *before* inflation adjustments.[38]

[Insert Table 6 here]

Results are reported in Table 6. We examine the effects on the issuance of short term debt in Panel A, and on long term debt in Panel B. First, as a placebo test, columns 1 to 4 in both panels examine whether the two groups of firms (small EBAT loss firms crossing to positive earnings after IA vs. small EBAT loss firms *not* crossing to positive earnings) issue different levels of debt *prior* to the end of the reporting period (during year *t*). This placebo test shows no differential effect in terms of both short term and long term debt issuance for the two groups of

[37] Because the number of firms that report small EBAT losses and then cross to the positive side of earnings after adding IA is relatively small, we choose to use the wider range of firms with scaled EBAT between -5% and 0%. Results are qualitatively similar and statistically significant at the 10% level if we use the narrower window of -2.5% and 0%.

[38] In our view, the key covariate to match on in this particular experiment is pre-tax earnings before adjustments (EBAT), and as Table A5 shows, the match on this dimension leaves no differences between the two groups: both treatment and control firms have a mean value of EBAT / Assets of -1.27%.

firms during the current reporting year. Second, columns 5 to 8 test whether debt issuance levels are different for the two groups of firms in year *t+1*; the year *after* the reporting has occurred. Results in Panel A of Table 6 indicate that crossing the zero-earnings threshold is associated with a statistically and economically significant higher level of issuance of short term bank debt: 1.2-1.4% of assets, relative to otherwise similar firms that had similar levels of negative EBAT but did *not* manage their IA to report positive EBT. In contrast to this result for the issuance of short term debt, Panel B shows that both in the year prior and after the reporting, the issuance of long term debt does not differ between the two groups of firms.

These findings highlight that among the firms reporting negative EBAT, those that cross over to report a positive EBT through the use of IA are more likely to issue short term debt the following year. As such, the reporting of positive earnings seems to facilitate firms' ability to raise short term debt financing in the following year. It is, however, important to note that we cannot say whether firms that did not cross to the positive earnings threshold also had strong external financing needs the following fiscal year, although our matching procedure – reported in Table A5 in the appendix – would control for any differences in observable firm characteristics.

5.5 Earnings Management Before and After 2007

Figure 4 shows the distributions of EBT, both before and after the elimination of IA in 2007. Interestingly, the distribution of EBT remains visibly discontinuous at the zero-earnings threshold after the elimination of IA in 2007.

[Insert Figure 4 here]

We test for discontinuities in the distribution of pre-tax earnings (EBT) in Table 2. The last three columns of Table 2 run the tests on the post-2007 period when the inflation adjustments system is no longer in place. The results are consistent with hypothesis H3a: The distribution of EBT – which in the absence of IA is now equal to EBAT in the post 2007 period – still exhibits a significant discontinuity around the zero-earnings threshold after the removal of the IIA system. With a t-statistic of 3.48, there is a statistically meaningful jump in the frequency of firms observed in the first bin showing positive earnings. Economic magnitudes are also

significant: The frequency of the bin right below the zero-EBT threshold is 0.73%, and jumps to 1.63% as it crosses the zero-earnings threshold.

Given the supportive evidence for hypothesis H3a, we explore next the different earnings management mechanisms firms resort to in order to avoid having to report an earnings loss (hypothesis H3b).

Our goal in this subsection is to exploit the elimination of IA in 2007 to investigate what other mechanisms may be used by firms to avoid reporting earning losses. As such, this quasi-experimental setting offers a unique opportunity to establish a pecking order of earnings management mechanisms (EMM). To do this, we start by examining how the distributions of different earnings measures change in the post-2007 period relative to the pre-2007 years.

[Insert Figure 5 here]

Figure 5 compares the distribution of key earnings measures in a "top-down" order, before (in blue) and after (in red) the removal of the IIA system in 2007. The top row contains the distribution of scaled gross income, the middle row contains the distribution of scaled operating earnings and the bottom row contains the distribution of scaled earnings before inflation adjustments and taxes (EBAT). In the right column, we plot the differences in frequencies before and after 2007 for each bin and the corresponding t-statistic.

In the top right chart, we see that there are no statistically significant differences in the distribution of gross income across the two time periods. From the middle row, although there appears to be a steeper slope in the negative bins to the left of the y-axis and a bigger discontinuity at zero in the post 2007 period, the chart on the right highlights no t-statistics exceeding conventional levels of significance. There are no statistically significant differences in the distribution of operating earnings before and after 2007.[39] Lastly, the bottom left chart plots the distribution of scaled EBAT before and after the elimination of the IIA system. In this case, the frequency to which we observe firms in small loss bins is significantly lower in the post 2007 distribution. Conversely, the frequency of small profit bins is significantly higher in the post

[39] Also note that as go "down" the income statement from gross profit to operating profit, the distribution of earnings becomes *less* discontinuous, as a mixture of distributions from more line items are added.

2007 period. Confirming this result, t-statistics in the bottom right chart are highly significant in the bins around the zero-earnings threshold. This pre vs. post analysis of the distributions of earnings measures clearly suggests that in the post 2007 period when IA are no longer available to manage earnings, firms appear to resort to managing items in between operating profits and EBAT. Given that the difference between operating earnings in the middle chart and EBAT in the bottom chart are due to non-operating revenues, we infer from the analysis in Figure 5 that after the elimination of inflation adjustments in 2007, non-operating revenues are used to a greater degree to push firms into reporting positive pre-tax earnings.

[Insert Table 7 here]

Table 7 reports the estimates of Eq. (3), which formally tests for changes in the discretionary use of non-operating revenues before and after the removal of inflation adjustments. We contrast the use of non-operating revenues between firms that exhibit a small operating loss and those with a small operating profit by including an indicator variable for small operating loss firms. We include the interaction term *Dummy Small Operating Loss* × *Dummy Post 2007* to test for differences in the use of non-operating items across firms below and above the positive operating earnings threshold, both before and after the elimination of inflation adjustments in 2007. The coefficient on the interaction term *Small Operating Loss* × *Post 2007* is statistically significant in all four columns. The magnitude of 0.92-97% of beginning-of-year assets in the interaction coefficient implies that after the elimination of IA in 2007, firms reporting small operating losses report a differentially higher level of non-operating revenues relative to similar firms with small operating profits. This result implies that even after controlling for time and industry fixed effects as well as firm-level controls, firms that report a small operating loss show significantly higher non-operating revenues after 2007, once inflation adjustments have been removed. This suggests that these non-operating items are used as a substitute for the inflation adjustment line item for firms that want to report higher earnings, in support of hypothesis H3b.[40]

[40] Results using the post-2007 sample are qualitatively and statistically similar when we exclude 2007 from our post-period sample.

We further explore in Table 8 some of the sources that lead to the increased use of non-operating items to achieve positive earnings. Specifically, we explore whether small operating loss firms increase their asset sales after the elimination of the IIA system to report higher non-operating revenues, and thus move to the positive side of earnings (see, for instance, Bartov (1993), and Herrmann et al. (2003)).[41] Through the interaction coefficient on *Small Operating Loss × Post 2007*, we test whether firms increase their sales of short term investments (columns 1 and 2), long term investments (columns 3 and 4) and sales of property plant and equipment (columns 5 and 6). There is no evidence of increased sales of either short term or long term investments to boost earnings in columns 1 to 4. However, results from columns 5 and 6 suggest that in the post-2007 period, firms reporting small operating losses increase their sales of property plant and equipment relative to small operating profit firms. Thus, our results provide evidence of earnings management related to the sale of tangible assets.

5.6 Ex Post vs. Ex Ante Measures of Suspect Firms

The earnings management literature typically relies on ex post definitions of suspect firms in tests of discretionary accruals and real activities manipulation. That is, firms are flagged as "suspect" if they report small positive earnings. However, when using this type of definition, it is not possible to know whether or not these firms were showing a loss prior to a potential discretionary use of certain accounting items and/or real activities.

We believe that one of the empirical advantages of studying the discretionary use of inflation adjustments is to be able to detect firms with ex ante strong incentives to manage earnings, i.e. those showing a small loss in earnings before inflation adjustments and taxes (EBAT). This ex ante approach to categorizing firms with incentives to manipulate is also used in the previous section (Section 5.5) by differentiating the use of non-operating revenues across firms that showed a small operating loss versus those with a small operating profit. We found that firms with small operating losses make significantly more use of non-operating revenues than those with a small operating gain.

To highlight the potential advantages of this ex ante categorization, we follow the literature and define a series of outcome variables related to the discretionary use of accruals and

[41] Bartov (1993) and Hermann et al (2003) provide evidence on the timing of asset sales as a way to manage reported earnings.

real activities manipulation (see Roychowdhury (2006)).[42] We also use the same ex post definition of suspect firms, i.e. firms that report a small profit before taxes.[43] And, more importantly, we add non-operating revenues – the one line item we have identified as being used to report positive EBT by firms identified ex ante as having strong incentives to manipulate – to our list of outcome variables.

To test the statistical significance of potential differences in the use of discretionary accruals and real activities manipulation for suspect firms versus other firms near the zero earnings threshold, we estimate regression (3). Under the managerial discretion hypothesis, suspect firms will increase their use of other means to manipulate earnings after the removal of inflation adjustments (H3b). To test directly for hypothesis H3b, we include an interaction term *Suspect Firms* × *Post 2007*. We further control for remaining differences in firm characteristics by again including firm-level controls as well as industry and year fixed effects. Results are presented in Table 9.

[Insert Table 9 here]

Each column of Table 9 presents the results for a different outcome variable. In the first column, we focus on abnormal accruals. The coefficient on *suspect firms* is positive (.0096) but not statistically significant. To test directly for hypothesis H3b in the context of discretionary accruals, we further explore the interaction term *Suspect Firms* × *Post 2007*. The coefficient of this interaction term is negative (-0.0084) and again not statistically significant. As such, we reject hypothesis H3b in the context of discretionary accruals. Similarly, we find no statistical significance for the coefficient on the interaction term in all other specifications of Table 9. Columns (2-4) show no increased use of abnormal CFO, abnormal production costs and abnormal discretionary expenses among suspect firms following the removal of inflation adjustments.

It is important to note that the lack of support for H3b from tests shown in Table 9 may not be driven by actual firm behavior but could also be caused by the lack of power of this more

[42] See appendix for details on variables construction.

[43] Using a propensity score matching technique similar to the one reported in Table 3, we match each suspect firm-year observation with a control firm-year observation taken among the pool of firms that report a small loss before taxes (EBT) in the same year.

conventional empirical approach. To wit, we run the same specification on non-operating revenues in the last column (column 5). The lack of significance on the interaction term *Suspect Firms* × *Post 2007* for non-operating revenues when using the ex post definition of "suspect firms" stands in sharp contrast to the significant results shown in Table 7, where we detected earnings management from firms with *a priori* strong incentives to manipulate earnings based on showing a small operating loss. Overall, the evidence presented in this subsection highlights the potential benefits of our empirical setting, which allows for a clearer categorization of firms with incentives to use their discretion in financial reporting.

6. Conclusion

We contribute to the earnings management literature by studying a unique setting in which an observable line item – inflation adjustments – offers significant managerial discretion to a large sample of private companies. By comparing the use of inflation adjustments for firms just above and just below the zero-earnings threshold *before* inflation adjustments, we find large-sample evidence of accounting discretion. Specifically, we show a significant discontinuity in the use of inflation adjustments: the group of firms just below the zero-earnings threshold exhibits significantly higher reported inflation adjustments values than the matched sample just above the threshold.

To better understand the incentives to report positive earnings among our comprehensive sample of private firms, we perform a cross-sectional analysis based on bank debt exposure. Colombia is a large bank-centric economy. Our conjecture is that bank contracting and monitoring should provide strong incentives for firms with higher bank debt levels to report positive earnings. We find evidence supportive of this argument: among firms exhibiting small losses before inflation adjustments (small EBAT losses), those with higher bank debt exposure report significantly higher inflation adjustments, even after controlling for a number of firm characteristics. We further show that firms that are able to report positive earnings through the use of inflation adjustments issue significantly more short-term debt in the year that follows.

Lastly, we take advantage of the removal of the IIA system in 2007 to better understand how firms adjust their reporting behavior when they have to resort to other earnings management mechanisms. We find that firms significantly increase their use of non-operating revenues after

2007. Interestingly, we find evidence that the sale of PP&E is a relevant type of real activity earnings management that private firms resort to in order to show positive earnings.

Finally, while our setting offers strong internal validity when empirically investigating the incentives, methods and consequences of earnings management among private firms, it remains focused on only one country. We leave to future research the extension of our findings to other earnings management tools and different countries.

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Figure 1. Distribution of earnings before inflation adjustments and taxes (EBAT), inflation adjustments (IA) and earnings before taxes (EBT), scaled by assets

The top panel shows the distribution of earnings before adjustments and taxes (EBAT), the middle panel shows the distribution of inflation adjustments (IA) and the bottom panel shows both the observed and simulated distribution of earnings after inflation adjustments and before taxes (EBT). Note that EBAT + IA = EBT (i.e. the combination of the distributions shown in the top and middle panels results in the distribution in the bottom panel). The simulated distribution of EBT is run by drawing 10,000 bootstrap samples of the observed distributions of EBAT and IA assuming a correlation of -0.22, which corresponds to the in-sample correlation between the two variables. The resulting simulated distribution for EBT is shown in the bottom panel using a red line. All earnings are deflated by beginning-of-year total assets. For ease of interpretation, distributions are bound between -0.2 (-20%) and +0.2 (+20%) of total assets. Partitions have a width of 0.0025 (.25%) of total assets**.** The sample period ranges from 2003 to 2006 (pre-2007 sample). The vertical lines around zero in the upper panel highlight the region from which we define the groups of "small loss firms" and "small profit firms" in Table 3.

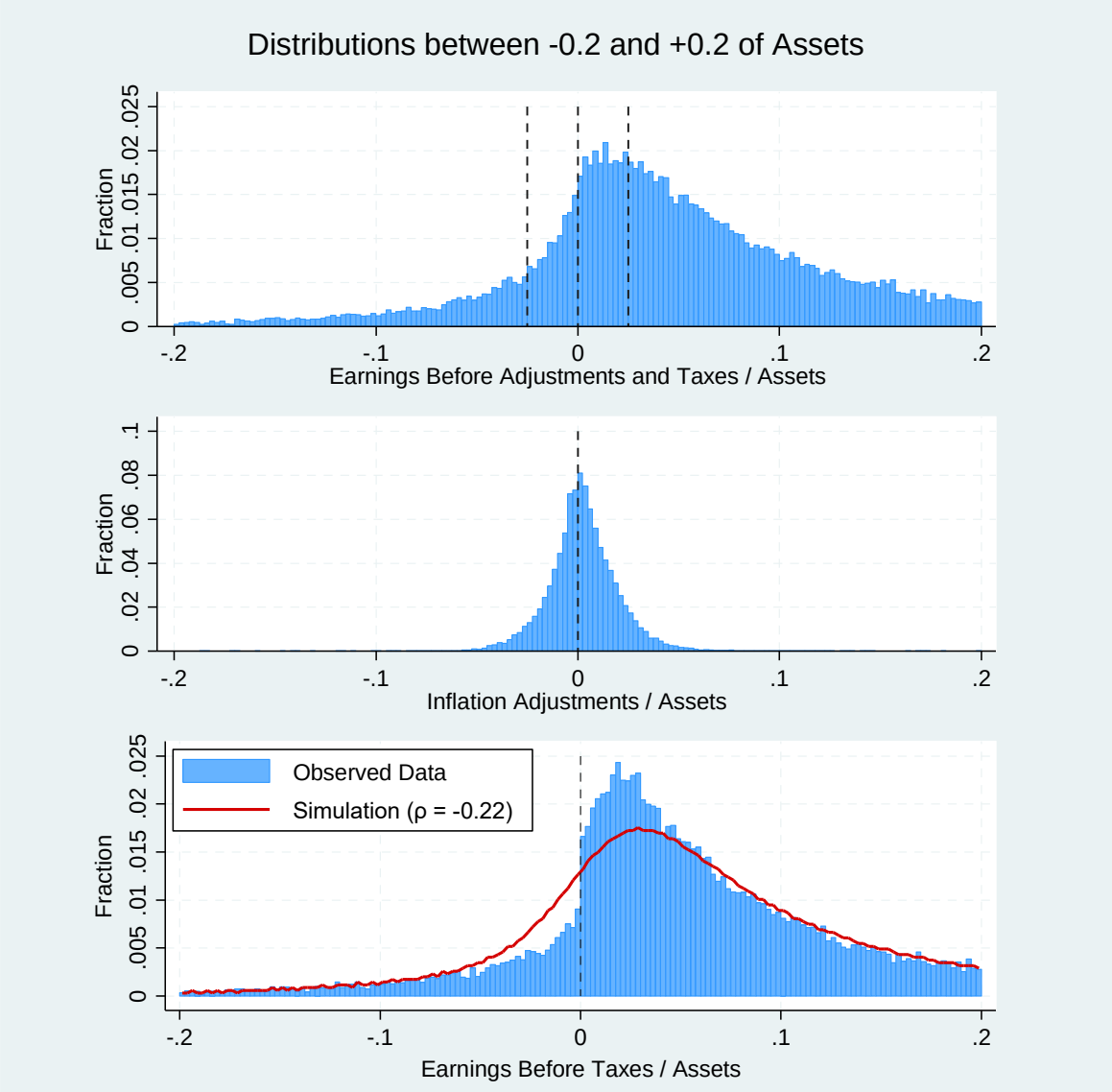

Figure 2. Distribution of inflation adjustments partitioned by earnings before adjustments and taxes

This figure presents the frequency distribution of inflation adjustments (IA) partitioned by earnings before adjustments and taxes (EBAT). All earnings are scaled by beginning-of-year total assets. The bars in dark blue indicate the bin that contains the median of each distribution. The unconditional sample median of scaled inflation adjustments of 0.0028 is represented by a red horizontal line. The sample period ranges from 2003 to 2006 (pre-2007 sample).

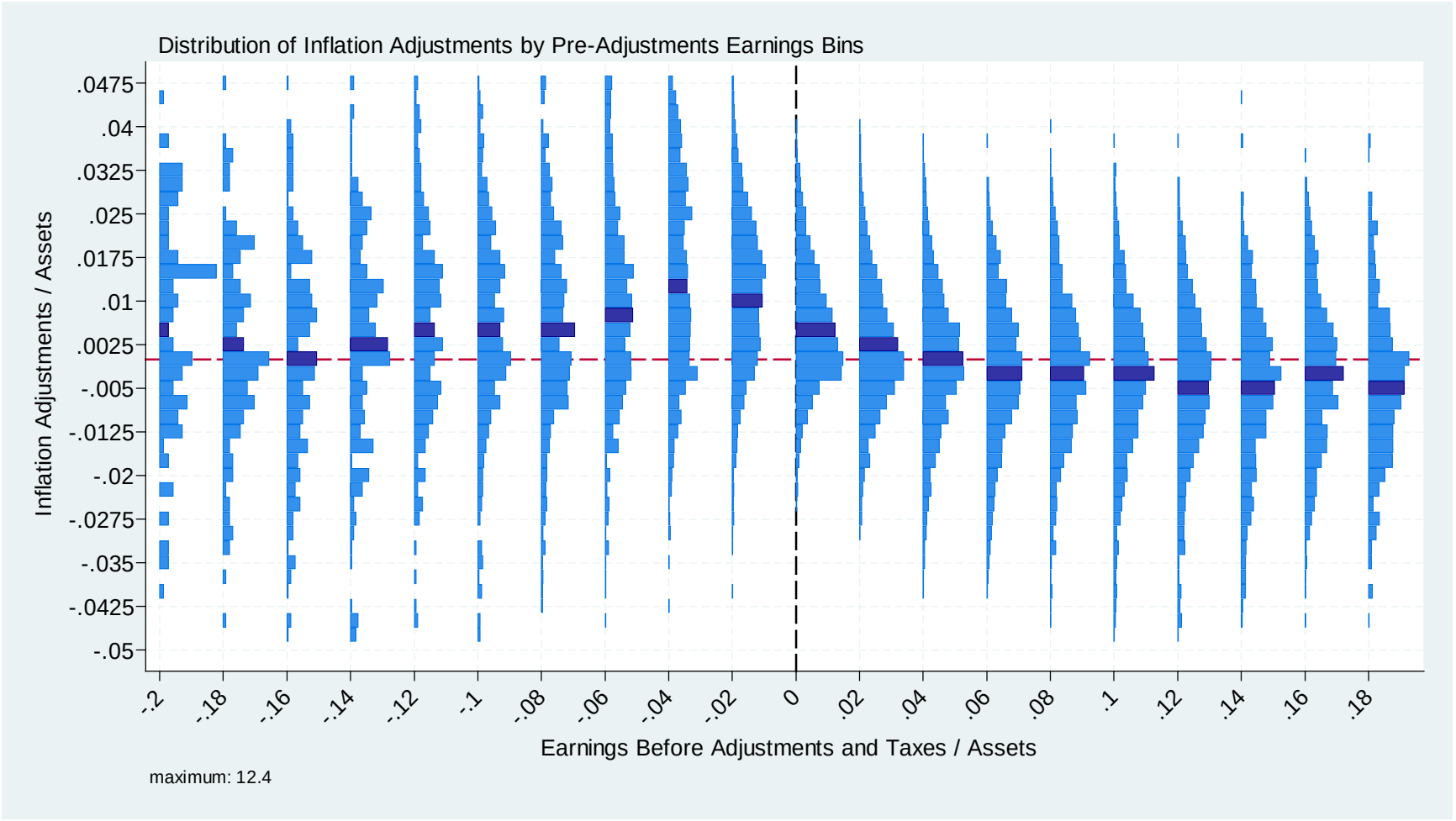

Figure 3. Bank debt issuance after reporting year for firms around the zero-earnings (EBT) threshold

This figure shows the mean net bank debt issuance at time *t+1* for firms below (in blue) and above (in red) the zero-earnings (EBT) threshold in year *t*. Both net bank debt issuance and EBT are scaled by beginning of the year assets. The sample period ranges from 2003 to 2006 (pre-2007 sample). The green solid lines plot the lines of best fit on each side of the zero-earnings threshold, using a quadratic function. The gray lines plot the 95% confidence interval around the lines of best fit.

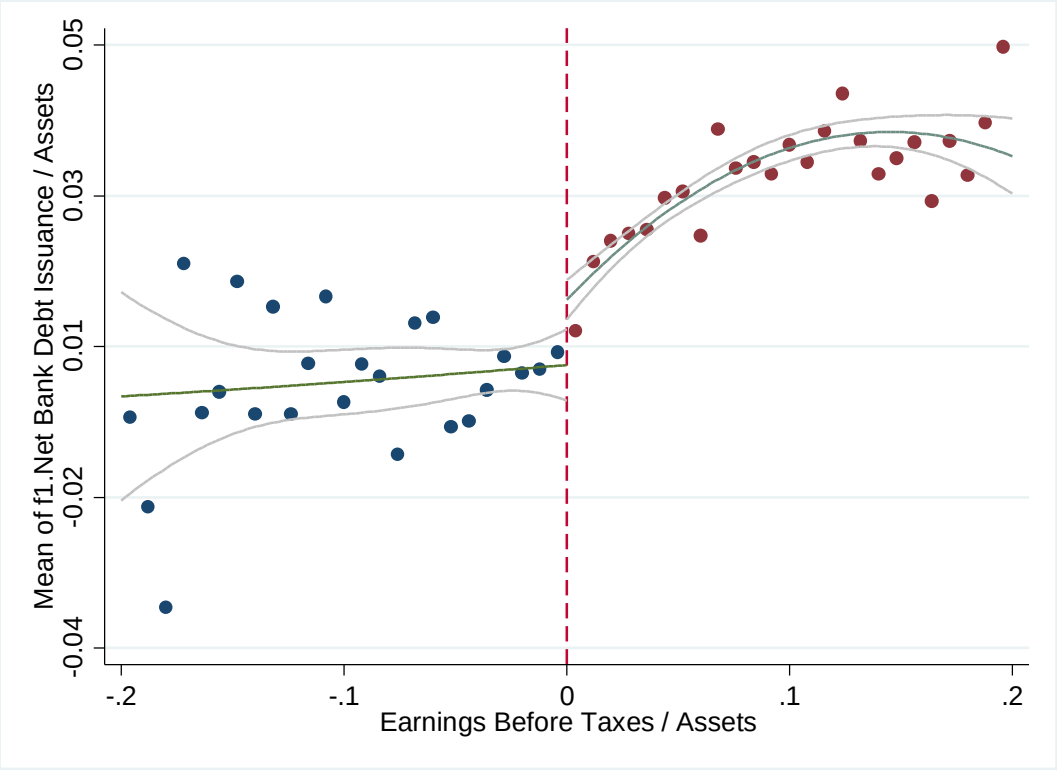

Figure 4. Distribution of earnings before taxes (EBT) before and after the elimination of inflation adjustments in 2007

This figure shows the distribution of earnings before taxes (EBT) before and after the elimination of inflation adjustments in 2007. All earnings are deflated by beginning-of-year total assets. For ease of interpretation, distributions are bound between -0.2 and +0.2 of total assets. Partitions have a width of 0.0025 of total assets**.** The sample period ranges from 2003 to 2006 (pre-2007 sample) on the left panel and 2007 to 2010 (post-2007 sample) on the right panel.

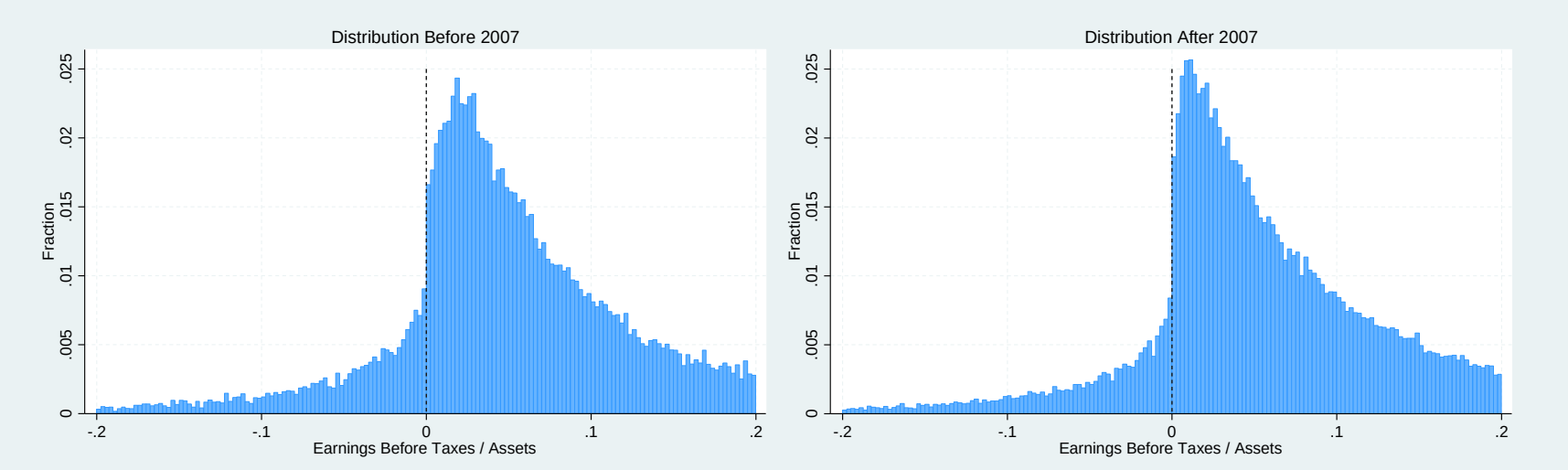

Figure 5. Distribution of profit measures before and after the elimination of inflation adjustments

This figure shows the frequency distribution of earnings measures before (in blue) and after (in orange) the elimination of inflation adjustments (IA) in 2007. All earnings measures are scaled by beginning-of-year assets. The top panel shows the distribution of gross profits; the middle panel shows operating profits; and the bottom panel shows earnings before taxes and IA. For the bottom panel, note that IA are equal to zero after 2007. The figures on the left column show the frequency distributions. The right figures plot the differences in frequency pre and post 2007 by partition. The associated t-statistics test for differences across the pre and post distributions for each partition. Similar to Degeorge et al (1999), we develop a t-statistic which extrapolates from neighborhood densities to compute the expected density at the evaluated bin. t-statistics are computed at each bin using the difference between the frequency in the pre-2007 period vs. the post-2007 period, and the standard deviation in the pre and post 2007 change in frequencies of 20 bins to each side of the evaluated bin.

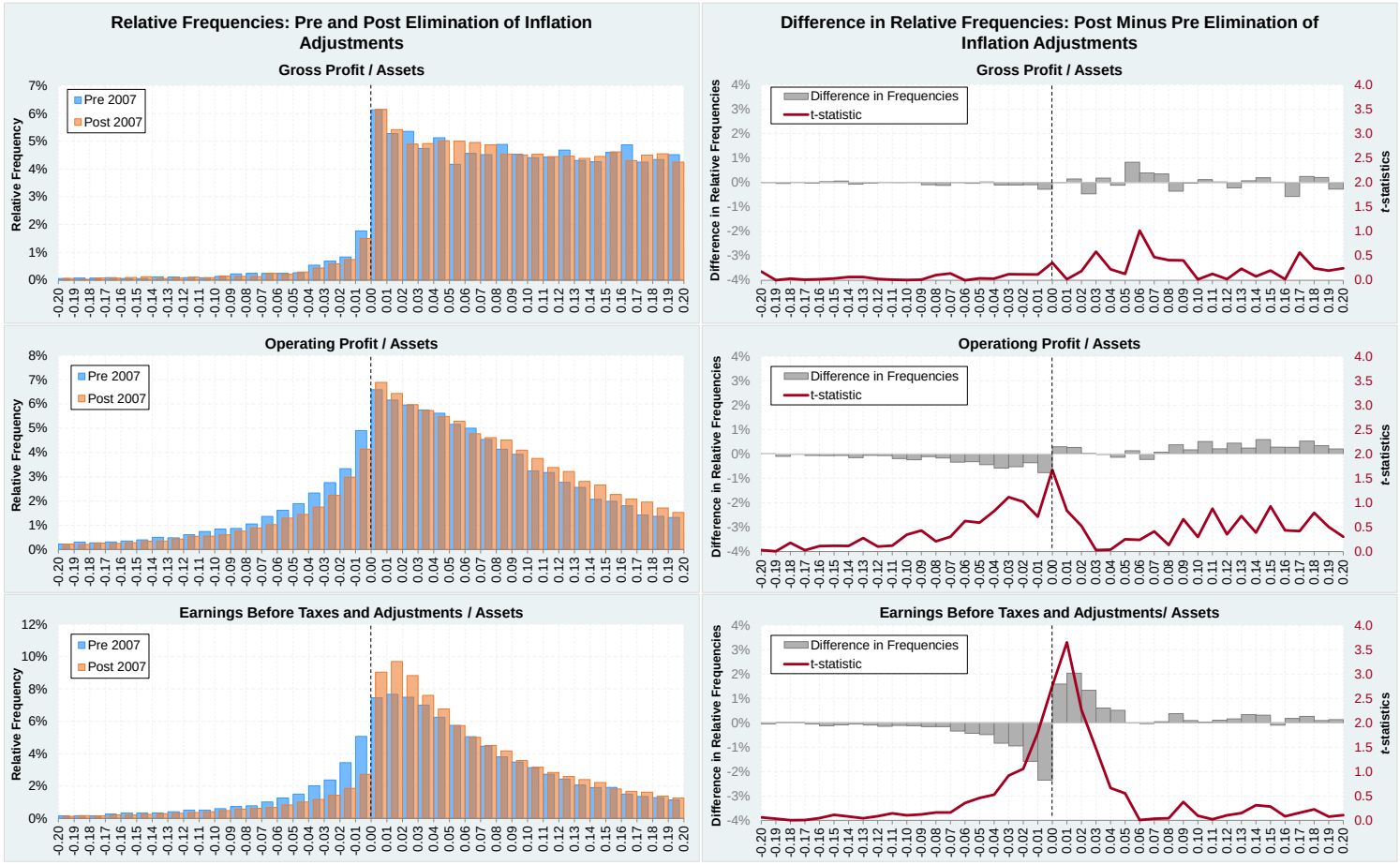

Table 1. Descriptive statistics

This table presents summary statistics (means) for our sample of Colombian firms during the period 2003-2010. The data source stems from the "Superintendencia de Sociedades" (Corporations Superintendence), a government agency overseeing all private corporations meeting certain criteria (see Data Section for details). The table reports the number of firms in our sample for each year. Firm characteristics comprise total assets (in COP million and USD million, converted at the average COP/USD exchange rate for each year), firm age (in years), return on equity (ROE), total external financing to total assets, bank debt to total assets, normalized capital expenditures (CapEx/Assets), scaled earnings before tax and inflation adjustments, scaled earnings before tax, and finally inflation adjustments. Earnings are scaled by beginning of period total assets. We then present results for aggregated data for (1) all years during which firms could use inflation adjustments (IA) in computing earnings (pre-2007); (2) all years after the removal of the accounting rule allowing firms to use IA (post-2007) and (3) the full sample.

			Firm characteristics										
Year	N	Inflation	Total assets (COP million)	Total assets (USD million)	Firm age	ROE	External Financing / Assets	Bank debt / Assets	CapEx / Assets	EBAT / Assets	EBT / Assets	Asset Tangibility	Inflation adjustments (IA) / Assets
2003	6,419	7.1%	24,203	8.42	21.9	1.7%	27.8%	11.8%	2.3%	5.2%	5.4%	20.5%	0.23%
2004	6,427	5.9%	22,156	8.43	22.2	2.5%	27.4%	11.9%	2.4%	5.6%	5.8%	19.8%	0.19%
2005	7,344	5.0%	21,286	9.17	21.6	4.0%	28.2%	12.3%	2.7%	6.5%	6.7%	19.6%	0.21%
2006	14,661	4.3%	15,839	6.71	18.0	7.1%	31.3%	12.7%	3.5%	8.0%	8.3%	21.1%	0.31%
2007	17,219	5.5%	15,565	7.49	17.9	8.0%	32.0%	13.7%	3.8%	8.7%	8.7%	21.3%	0
2008	16,233	7.0%	18,422	8.54	18.8	6.9%	31.2%	13.7%	3.4%	8.0%	8.0%	20.5%	0
2009	16,182	4.2%	20,198	10.26	19.7	5.1%	29.7%	13.2%	2.8%	6.5%	6.5%	20.4%	0
2010	18,917	2.3%	20,110	10.59	19.2	6.9%	30.2%	13.6%	2.9%	7.4%	7.4%	20.1%	0
Pre-2007	34,851	5.6%	19,693	7.86	20.3	4.6%	29.3%	12.3%	2.9%	6.7%	7.0%	20.4%	0.25%
Post-2007	68,551	4.8%	18,590	9.25	18.9	6.8%	30.8%	13.5%	3.2%	7.7%	7.7%	20.5%	0
Full sample	103,402	5.2%	18,961	8.78	19.4	6.0%	30.3%	13.1%	3.1%	7.3%	7.4%	20.5%	0.09%

Table 2. Statistical tests for discontinuities around zero earnings threshold before and after inflation adjustments

This table computes the difference between realized and expected and earnings frequencies both before and after inflation adjustments for partitions centered around zero profits. The first set of columns reports results for earnings before adjustments and taxes (EBAT), while the second set shows the results for earnings after adjustments and before taxes (EBT). Note that EBAT + IA = EBT. All earnings are deflated by beginning-of-year total assets. The expected frequency is computed as the mean of the frequency in the two adjacent partitions. Partitions have a width of 0.0025 (.25%) of total assets. Since inflation adjustments were eliminated in 2007, we separate the sample in two sub-periods: Pre-2007 (before IA removal) and Post-2007 (after IA removal). For the post-2007 period, we have only one set of results given that no inflation adjustments are allowed (i.e. EBAT = EBT, since IA = 0 after 2007). The *t*-statistics are computed as in Degeorge et al. (1999) and Coppens and Peek (2005), see text for details. ***, **, and * indicates bins with discontinuities significant at the 1%, 5% and 10% level, respectively. The first bin above the zero earnings threshold is highlighted in bold.

	Pre 2007 Period: Inflation Adjustments System in place						Post 2007 Period: No Inflation Adjustments System		
	Scaled earnings before taxes and before inflation adjustments (EBAT)			Scaled earnings before taxes and *after* inflation adjustments (EBT)			Scaled earnings before taxes (EBT)		
Bin	Frequency	Observed vs. Expected Frequency	*t*-stat	Frequency	Observed vs. Expected Frequency	*t*-stat	Frequency	Observed vs. Expected Frequency	*t*-stat
1.25% to 1.5%	1.84%	0.22%	1.280	1.86%	0.03%	-0.367	2.15%	-0.09%	-0.841
1% to 1.25%	1.62%	-0.11%	-1.370	1.82%	-0.01%	-0.633	2.24%	0.00%	-0.443
0.75% to 1%	1.73%	0.12%	0.465	1.83%	0.11%	0.095	2.24%	0.12%	0.076
0.5% to 0.75%	1.61%	-0.08%	-1.098	1.72%	0.18%	0.504	2.12%	0.21%	0.462
0.25% to 0.5%	1.68%	0.15%	0.737	1.55%	0.11%	0.113	1.91%	0.28%	0.753
0% to 0.25%	**1.53%**	**0.23%**	**1.326**	**1.44%**	**0.64%*** **	**3.364**	**1.63%**	**0.91%*** **	**3.478**
-0.25% to 0%	1.30%	0.15%	0.714	0.80%	0.18%	0.521	0.73%	0.13%	0.101
-0.5% to -0.25%	1.15%	0.05%	-0.124	0.62%	-0.04%	-0.846	0.60%	0.05%	-0.234
-0.75% to -0.5%	1.10%	0.21%	1.167	0.67%	0.08%	-0.100	0.55%	0.06%	-0.190
-1% to -0.75%	0.89%	0.06%	-0.033	0.59%	0.06%	-0.225	0.49%	0.12%	0.082
-1.25% to -1%	0.83%	-0.01%	-0.554	0.53%	0.04%	-0.313	0.37%	-0.09%	-0.841
-1.5% to -1.25%	0.84%	0.18%	0.895	0.49%	0.07%	-0.154	0.46%	0.04%	-0.266

Table 3. Matched sample statistics: small loss firms vs. small profit firms

This table presents summary statistics for the sample of firms just above (and below) the threshold of zero earnings before inflation adjustments and taxes (EBAT). "Small loss firms" have earnings before inflation adjustments and taxes between -2.5% and 0% of total assets. "Small profit firms" have scaled earnings before inflation adjustments and taxes between 0% and +2.5% and are matched to the sample of "small loss firms" using a one-to-one, nearest neighbor matching estimator with replacement. Propensity score matching is performed year by year based on the set of firm characteristics reported in Panel A. Since IA are eliminated in 2007, only data before 2007 are used. Panel B reports scaled earnings before taxes and adjustments (EBAT), inflation adjustments (IA) and earnings after adjustments and before taxes (EBT). Note that EBAT + IA = EBT. Differences in means (*t*-test) between the unmatched and matched samples of "small loss firms" and "small profit firms" are performed and resulting p-values are reported.

Panel A. Firm Characteristics

	Unmatched Sample Means			Matched Sample Means		
	Small Loss Firms (Treatment)	Small Profit Firms (Untreated)	*t*-test Diff. in means (p-values)	Treatment	Control	*t*-test Diff. in means (p-values)
Total assets	18,044,374	20,753,283	0.408	18,044,374	21,245,958	0.463
Age	20.4	21.0	0.071	20.4	20.5	0.767
External Financing / Assets	34.09%	30.95%	0.000	34.09%	33.86%	0.731
Debt / Assets	14.51%	13.71%	0.029	14.51%	14.94%	0.337
CapEx / Assets	1.84%	2.13%	0.049	1.84%	1.80%	0.845
PP&E / Assets	23.98%	22.69%	0.014	23.98%	23.40%	0.356
Number of Observations:	2,832	5,707		2,832	2,832	

Panel B. Inflation adjustments and earnings

	Unmatched Sample Means			Matched Sample Means		
	Small Loss Firms (Treatment)	Small Profit Firms (Untreated)	t-test Diff. in means (p-values)	Treatment	Control	t-test Diff. in means (p-values)
EBAT / Assets	-1.05%	1.26%	0.000	-1.05%	1.25%	0.000
Inflation adjustments / Assets	1.22%	0.65%	0.000	1.22%	0.78%	0.000
EBT / Assets	0.17%	1.91%	0.000	0.17%	2.03%	0.000
Number of Observations:	2,832	5,707		2,832	2,832	

Table 4. Small loss firms vs. small profit firms: multivariate tests of differences in inflation adjustments.

This table tests for a differential use of inflation adjustments (IA) for firms "just below" versus "just above" zero earnings before inflation adjustments and taxes (EBAT). To allow for a potential differential effect across the two groups of firms, we create the indicator variable *Dummy Small Loss EBAT* that takes a value of one if a firm has a small loss (scaled EBAT within [-2.5%; 0%]) in a given year and a value of zero otherwise (scaled EBAT within [0%; +2.5%]). Small loss firms have been matched to small profit firms using a propensity score matching technique (see Table 3). We further control for remaining differences in firm characteristics by including firm-level controls as well as industry and year fixed effects. Since inflation adjustments are eliminated in 2007, only data before 2007 are used in these tests. Standard errors clustered by firm are reported in parentheses. ***, **, and * indicates significance at the 1%, 5% and 10% level, respectively.

	Dependent Variable: Inflation Adjustments / Assets			
	(1)	(2)	(3)	(4)
Constant	0.0078***	0.0106***	-0.0027	-0.0035
	(0.0004)	(0.0007)	(0.0033)	(0.0031)
Dummy Small Loss EBAT	0.0044***	0.0043***	0.0042***	0.0041***
	(0.0005)	(0.0005)	(0.0004)	(0.0004)
Ln of Assets			0.0002	0.0002
			(0.0002)	(0.0002)
Ln(Age)			-0.0014***	-0.0014***
			(0.0004)	(0.0004)
Capex / Assets			-0.0010	-0.0005
			(0.0040)	(0.0039)
Fixed Assets / Assets			0.0182***	0.0179***
			(0.0011)	(0.0011)
External Financing / Assets			0.0233***	0.0236***
			(0.0015)	(0.0015)
Debt / Assets			0.0007	0.0004
			(0.0019)	(0.0019)
Year FE	No	Yes	No	Yes
Industry FE	No	Yes	No	Yes
Observations	5,664	5,664	5,664	5,664
r2	0.019	0.062	0.265	0.245

Table 5. Small loss firms vs. small profit firms: cross-sectional tests of differences in inflation adjustments

This table tests for cross-sectional differences in the use of inflation adjustments (IA) by "small loss" and "small profit" firms, based on exposure to financial leverage. We allow for differences in the use of IA for these two groups by including the indicator variable *Dummy Small Loss EBAT*, which takes a value of one if a firm has a small loss (scaled EBAT within [-2.5%; 0%]) in a given year and a value of zero if a firm has a small profit (scaled EBAT within [0%; +2.5%]). Small loss firms have been matched to small profit firms using a propensity score matching technique (see Table 3). The additional indicator variable *Dummy High Bank Lev.* takes a value of one (zero) if a firm as a bank debt to total asset ratio above (respectively below) the median bank debt to total asset ratio for the full sample in any given year. The interaction term *Dummy Small Loss EBAT* × *Dummy High Bank Lev.* tests for differences in the use of inflation adjustments across firms with different bank debt levels above or below the positive earnings threshold. The indicator *Dummy High Tangibility* takes a value of one (zero) if a firm has a fixed asset to total asset ratio above (respectively below) the median ratio in any given year. We further control for remaining differences in firm characteristics by including firm-level covariates as well as industry and year fixed effects. Since IA are eliminated in 2007, only data before 2007 are used in these tests. Standard errors clustered by firm are reported in parentheses. ***, **, and * indicates significance at the 1%, 5% and 10% level, respectively.

	Dependent Variable: Inflation Adjustments / Assets			
	(1)	(2)	(3)	(4)
Constant	0.0046***	0.0072***	-0.0032	-0.0033
	(0.0006)	(0.0009)	(0.0030)	(0.0032)
Dummy Small Loss EBAT	0.0034***	0.0033***	0.0036***	0.0036***
	(0.0008)	(0.0008)	(0.0009)	(0.0009)
High Bank Lev.	0.0058***	0.0057***	0.0014*	0.0011
	(0.0008)	(0.0008)	(0.0008)	(0.0008)
Dummy Small Loss EBAT × High Bank Lev.	0.0019*	0.0019*	0.0024***	0.0025***
	(0.0010)	(0.0010)	(0.0009)	(0.0009)
High Tangibility			0.0005	0.0010
			(0.0008)	(0.0008)
Dummy Small Loss EBAT × High Tangibility			-0.0013	-0.0014
			(0.0009)	(0.0009)
Ln of Assets			0.0002	0.0002
			(0.0002)	(0.0002)
Ln(Age)			-0.0016***	-0.0014***
			(0.0004)	(0.0004)
Capex / Assets			-0.0009	-0.0008
			(0.0040)	(0.0039)
Fixed Assets / Assets			0.0167***	0.0173***
			(0.0013)	(0.0013)
External Financing / Assets			0.0221***	0.0236***
			(0.0014)	(0.0015)
Debt / Assets			-0.0040*	-0.0045**
			(0.0022)	(0.0023)
Year FE	No	Yes	No	Yes
Industry FE	No	Yes	No	Yes
Observations	5,664	5,664	5,664	5,664
r2	0.0647	0.103	0.207	0.249

Table 6. Benefits of reporting positive earnings through inflation adjustments: evidence from bank debt issuances

This table explores the benefits of managing IA to cross to the positive side of the zero earnings threshold. This analysis focuses on observations where firms report negative EBAT between -5% and 0% of beginning-of-year assets. The indicator variable "Crosses to Positive Earnings After IA" takes a value of one for firms with small EBAT losses that cross the zero-earnings threshold and report *positive* EBT through their use of IA. It takes a value of zero for a matched sample of firms that also have small EBAT losses but that after IA still report negative EBT (Table A5 in the Appendix reports the results of the matching procedure). We examine the effects on the issuance of short term debt in Panel A, and on the issuance of long term debt in Panel B. Columns 1 to 4 test whether these two sets of firms issue different levels of debt *prior* to the reporting. Columns 5 to 8 test whether debt issuance patterns are different in *t+1*, that is, the year after the reporting. Since inflation adjustments are eliminated in 2007, only data before 2007 are used in these tests. Standard errors clustered by firm are reported in parentheses. ***, **, and * indicates significance at the 1%, 5% and 10% level, respectively.

Panel A. Effect on Short Term Debt Issuance

	Short Term Net Debt Issuance$_t$ / Assets				Short Term Net Debt Issuance$_{t+1/}$ Assets			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	0.005	-0.005	-0.048	-0.057	0.000	-0.011	0.030	0.013
	(0.005)	(0.008)	(0.041)	(0.043)	(0.016)	(0.036)	(0.034)	(0.038)
Crosses to Positive Earnings After IA	0.000	-0.001	-0.001	-0.003	0.012*	0.013**	0.013**	0.014**
	(0.006)	(0.006)	(0.006)	(0.006)	(0.007)	(0.006)	(0.007)	(0.006)
Ln of Assets			0.003	0.003			-0.001	-0.001
			(0.002)	(0.003)			(0.002)	(0.002)
Ln(Age)			0.000	-0.001			0.000	0.001
			(0.004)	(0.004)			(0.004)	(0.003)
Capex / Assets			0.098**	0.111***			-0.037	-0.015
			(0.042)	(0.042)			(0.045)	(0.039)
Fixed Assets / Assets			-0.009	-0.008			-0.018	-0.008
			(0.010)	(0.009)			(0.011)	(0.009)
External Financing / Assets			-0.001	-0.008			-0.013	-0.017
			(0.013)	(0.012)			(0.012)	(0.012)
Debt / Assets			0.079**	0.088***			-0.072***	-0.073***
			(0.033)	(0.032)			(0.023)	(0.022)
EBAT / Assets			-0.021	0.022			-0.299	-0.320
			(0.296)	(0.308)			(0.282)	(0.279)
Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Industry FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	3,258	3,258	3,258	3,258	2,793	2,793	2,793	2,793
r2	0.000	0.018	0.031	0.050	0.004	0.033	0.029	0.057

Panel B. Effect on Long Term Debt Issuance

	Long Term Net Debt Issuance$_t$ / Assets				Long Term Net Debt Issuance$_{t+1/}$ Assets			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Constant	0.006	0.014	0.016	0.006	-0.001	0.018	-0.019	-0.013
	(0.005)	(0.013)	(0.034)	(0.038)	(0.006)	(0.021)	(0.036)	(0.034)
Crosses to Positive Earnings After IA	-0.005	-0.004	-0.006	-0.005	0.000	-0.001	0.001	-0.001
	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)	(0.006)	(0.006)	(0.006)
Ln of Assets			-0.001	0.000			0.002	0.003
			(0.003)	(0.003)			(0.002)	(0.003)
Ln(Age)			-0.003	-0.003			-0.003	-0.002
			(0.004)	(0.003)			(0.003)	(0.003)
Capex / Assets			0.175***	0.162***			0.146**	0.127**
			(0.054)	(0.054)			(0.060)	(0.052)
Fixed Assets / Assets			-0.000	-0.007			-0.010	-0.015
			(0.010)	(0.010)			(0.010)	(0.011)
External Financing / Assets			-0.002	-0.011			0.011	0.011
			(0.011)	(0.012)			(0.011)	(0.013)
Debt / Assets			0.088***	0.095***			-0.032*	-0.033
			(0.022)	(0.021)			(0.019)	(0.020)
EBAT / Assets			0.414	0.278			0.678**	0.633**
			(0.269)	(0.260)			(0.302)	(0.294)
Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Industry FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	3,258	3,258	3,258	3,258	2,793	2,793	2,793	2,793
r2	0.001	0.033	0.057	0.085	0.000	0.029	0.028	0.054

Table 7. Small operating loss vs. small operating profit firms: use of non-operating revenues before and after the elimination of inflation adjustments

This table report differences-in-differences (DD) estimators of the effects of being "just below" versus "just above" zero operating profit in the period before and after inflation adjustments were eliminated. *Small Operating Loss* is a dummy variable that takes a value of one if a firm has a small operating loss (defined as scaled operating profit within [-2.5%; 0%]) in a given year and a value of zero if a firm has a small operating profit (scaled operating profit within [0%; +2.5%]). *Dummy Post 2007* takes a value of one (zero) for every firm-year observation after (before) the elimination of inflation adjustments in 2007. Small operating loss firms have been matched to small operating profit firms using a propensity score matching technique (results of the matching procedure are reported in Table A6 in the Appendix). We further control for remaining differences in firm characteristics by including several firm-level controls as well as industry and year fixed effects. Note that the time fixed effects absorb the direct effects of Post 2007 in columns 2 and 4. Standard errors clustered by firm are reported in parentheses. ***, **, and * indicates significance at the 1%, 5% and 10% level, respectively.

	Non-Operating Revenue / Assets			
	(1)	(2)	(3)	(4)
Constant	0.0457***	0.0397***	-0.0330**	-0.0316***
	(0.0019)	(0.0034)	(0.0151)	(0.0111)
Small Operating Loss	0.0104***	0.0105***	0.0104***	0.0104***
	(0.0024)	(0.0023)	(0.0023)	(0.0023)
Post 2007	-0.0017	-	-0.0034	-
	(0.0023)		(0.0191)	
Small Operating Loss × Post 2007	0.0095***	0.0092***	0.0097***	0.0093***
	(0.0031)	(0.0031)	(0.0031)	(0.0030)
Ln of Assets			0.0054***	0.0054***
			(0.0006)	(0.0007)
Ln(Age)			-0.0008	-0.0012
			(0.0012)	(0.0012)
Capex / Assets			0.0077	0.0094
			(0.0168)	(0.0165)
Fixed Assets / Assets			-0.0283***	-0.0293***
			(0.0037)	(0.0038)
External Financing / Assets			0.0103**	0.0094*
			(0.0049)	(0.0049)
Debt / Assets			0.0070	0.0074
			(0.0064)	(0.0065)
Year FE	No	Yes	No	Yes
Industry FE	No	Yes	No	Yes
Observations	14,682	14,682	14,682	14,682
r2	0.011	0.047	0.085	0.065

Table 8. Real activity manipulation: changes in assets sales patterns before and after the elimination of inflation adjustments

This table presents differences-in-differences matching estimators for asset sales around the elimination of the IIA system in 2007. Data on asset sales are reported by firms as items in the statement of cash flows. *Small Operating Loss* is a dummy variable that takes a value of one if a firm has a small operating loss (defined as scaled operating profit within [-2.5%; 0%]) in a given year and a value of zero if a firm has a small operating profit (scaled operating profit within [0%; +2.5%]). *Dummy Post 2007* takes a value of one for every firm-year observation after the elimination of inflation adjustments in 2007. Small operating loss firms have been matched to small operating profit firms using a propensity score matching technique (results of the matching procedure are reported in Table A6 in the Appendix). Note that the time fixed effects absorb the direct effects of Post 2007 in all columns. All outcomes are scaled by beginning-of-the-year assets. Standard errors clustered by firm are reported in parentheses. ***, **, and * indicates significance at the 1%, 5% and 10% level, respectively.

	Sales of Short Term Investments		Sales of Long Term Investments		Sales of PPE	
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	0.0042***	-0.0160***	0.0025***	-0.0052***	0.0109***	-0.0012
	(0.0014)	(0.0053)	(0.0005)	(0.0014)	(0.0016)	(0.0047)
Small Operating Loss	0.0025**	0.0025*	0.0004	0.0003	-0.0003	-0.0009
	(0.0013)	(0.0013)	(0.0004)	(0.0004)	(0.0010)	(0.0010)
Small Operating Loss × Post 2007	-0.0010	-0.0009	-0.0001	-0.0000	0.0033**	0.0036***
	(0.0017)	(0.0016)	(0.0005)	(0.0005)	(0.0014)	(0.0013)
Ln of Assets		0.0017***		0.0005***		0.0007***
		(0.0003)		(0.0001)		(0.0002)
Ln(Age)		-0.0005		0.0004**		-0.0000
		(0.0007)		(0.0002)		(0.0005)
Capex / Assets		0.0200***		0.0030		-0.2371***
		(0.0070)		(0.0020)		(0.0148)
Fixed Assets / Assets		-0.0070***		-0.0021***		0.0271***
		(0.0016)		(0.0005)		(0.0024)
External Financing / Assets		-0.0092***		-0.0020***		0.0001
		(0.0024)		(0.0005)		(0.0019)
Debt / Assets		0.0054		0.0004		0.0052*
		(0.0037)		(0.0008)		(0.0026)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	14,682	14682	14,682	14,682	14,682	14,682
r2	0.013	0.020	0.016	0.025	0.012	0.197

Table 9. Comparison of suspect firm-years with other firms in the vicinity of zero earnings for various measures of earnings management

This table analyses the use of discretionary accruals, real activities manipulation and non-operating revenues for suspect firms versus other firms near the zero earnings threshold. We follow Roychowdhury (2006) in the definition of the dependent variables. A firm-year observation is flagged as "suspect" if the firm was able to report a small profit before taxes (EBT) for that year. We match each suspect firm-year observation with a control firm-year observation taken among the pool of firms that report a small loss before taxes (EBT) in the same year. We use a propensity score matching technique (same technique as in Table 3 applied to earnings before taxes (EBT) instead of EBAT). Each column presents the results for a different dependent variable, whose name appears at the top of the respective column. We further control for remaining differences in firm characteristics by including several firm-level controls as well as industry and year fixed effects. Standard errors clustered by firm are reported in parentheses. ***, **, and * indicates significance at the 1%, 5% and 10% level, respectively.

	Abnormal Accruals	Abnormal CFO	Abnormal Production Costs	Abnormal Discretionary Expenses	Non-Operating Revenue / Assets
	(1)	(2)	(3)	(4)	(5)
Suspect Firms	0.0096	-0.0007	-0.0112	0.0035	-0.0020
	(0.0088)	(0.0070)	(0.0134)	(0.0114)	(0.0031)
Post 2007	-0.0280**	0.0365***	0.0056	-0.0107	-0.0079
	(0.0126)	(0.0096)	(0.0191)	(0.0168)	(0.0055)
Suspect Firms * Post 2007	-0.0084	0.0111	-0.0152	0.0103	-0.0066
	(0.0113)	(0.0090)	(0.0233)	(0.0229)	(0.0045)
Ln of Assets	0.0034*	-0.0029*	0.0045	-0.0008	0.0070***
	(0.0019)	(0.0017)	(0.0040)	(0.0041)	(0.0021)
Firm Age in Years	-0.0003	-0.0002	0.0002	0.0000	-0.0004***
	(0.0002)	(0.0002)	(0.0004)	(0.0004)	(0.0001)
Capex / Assets	-0.7145***	0.6767***	-0.2721**	0.3289***	0.0936*
	(0.0989)	(0.0922)	(0.1115)	(0.1023)	(0.0486)
Fixed Assets / Assets	-0.0096	0.0194*	0.0061	-0.0388	-0.0188***
	(0.0147)	(0.0109)	(0.0307)	(0.0315)	(0.0069)
External Financing / Assets	0.0830***	-0.0443***	0.0082	0.0003	0.0368***
	(0.0152)	(0.0121)	(0.0314)	(0.0314)	(0.0077)
Industry	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	3,610	3,610	3,610	3,610	3,610
r2	0.101	0.117	0.0290	0.0295	0.122

Appendix

I. Definition of Measures of Accounting Discretion

We define the following measures of discretionary accounting reporting:

i. **Discretionary accruals**: Following common practice in the literature (e.g. Cohen, Dey, and Lys (2008)), we compute the discretionary portion of accruals by first estimating "normal" levels of accruals with the modified cross-sectional Jones model (Jones (1991)) as described in Dechow et al. (1995). The model is estimated yearly for each two-digit ISIC industry:

$$\frac{TA_{it}}{Assets_{i,t-1}} = k_1 \frac{1}{Assets_{i,t-1}} + k_2 \frac{\Delta REV_{it}}{Assets_{i,t-1}} + k_3 \frac{PPE_{it}}{Assets_{i,t-1}} + \varepsilon_{it}$$

where, for fiscal year *t* and firm *i*, the variables are defined as:

a. $TA_{it} = EBXI_{it} - CFO_{it}$ where *EBXI* is earnings before extraordinary items and *CFO* is operating cash flows taken from the statement of cash flows.
b. *Assets* = Total assets.
c. ΔREV = Yearly change in operating revenues
d. *PPE* = Property, Plant and Equipment

We require a minimum of 15 observations per regression in order to estimate "normal" levels of accruals defined using the fitted values from the regression estimates:

$$NA = \hat{k}_1 \frac{1}{Assets_{i,t-1}} + \hat{k}_2 \frac{\Delta REV_{it}}{Assets_{i,t-1}} + \hat{k}_3 \frac{PPE_{it}}{Assets_{i,t-1}}$$

The discretionary portion of accruals (DA) is then simply defined as the difference between total accruals and "normal" accruals: $DA_{it} = TA_{it} - NA_{it}$.

ii. **Real activities manipulation**:

There is a growing literature focusing on real activities manipulation. We replicate the measures developed by Roychowdhury (2006)). In particular, we use his definition for the following three variables:

a. Abnormal CFO
b. Abnormal Production Costs
c. Abnormal Discretionary Expenses

Similar to the computation of discretionary accruals, all three "abnormal" variables require a model for "normal" levels of cash flow from operations (CFO), production costs and discretionary expenses respectively. Following Dechow et al. (1998), we estimate yearly cross-sectional regressions for each two-digit ISIC industry:

$$\frac{CFO_{it}}{Assets_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Assets_{i,t-1}} + \beta_1 \frac{S_{it}}{Assets_{i,t-1}} + \beta_2 \frac{\Delta S_{it}}{Assets_{i,t-1}} + \varepsilon_{it}$$

where, for fiscal year *t* and firm *i*, the variables are defined as:

a. *CFO* = Operating cash flows taken from the statement of cash flows
b. *Assets* = Total assets
c. *S* = Total sales
d. ΔS = Yearly change in sales

We require a minimum of 15 observations per regression in order to estimate "normal" levels of CFOs defined using the fitted values from the regression estimates:

$$NCFO_{it} = \hat{\alpha}_1 \frac{1}{Assets_{i,t-1}} + \hat{\beta}_1 \frac{S_{it}}{Assets_{i,t-1}} + \hat{\beta}_2 \frac{\Delta S_{it}}{Assets_{i,t-1}}$$

Abnormal CFOs are then defined as the difference between actual CFO and "normal" CFO: $ACFO_{it} = CFO_{it} - NCFO_{it.}$

We define production costs as $PROD_{it} = COGS_{it} - \Delta INV_{it.}$ We estimate normal levels of production costs by first estimating yearly regressions for each two-digit ISIC industry:

$$\frac{PROD_{it}}{Assets_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Assets_{i,t-1}} + \beta_1 \frac{S_{it}}{Assets_{i,t-1}} + \beta_2 \frac{\Delta S_{it}}{Assets_{i,t-1}} + \beta_3 \frac{\Delta S_{it-1}}{Assets_{i,t-1}} + \varepsilon_{it}$$

where the variables are defined in the same way as above.

We again require a minimum of 15 observations per regression in order to estimate "normal" levels of production defined using the fitted values from the regression estimates:

$$NPROD_{it} = \hat{\alpha}_1 \frac{1}{Assets_{i,t-1}} + \hat{\beta}_1 \frac{S_{it}}{Assets_{i,t-1}} + \hat{\beta}_2 \frac{\Delta S_{it}}{Assets_{i,t-1}} + \hat{\beta}_3 \frac{\Delta S_{it-1}}{Assets_{i,t-1}}$$

Abnormal Production Costs are then defined as the difference between actual production costs and "normal" production costs: $APROD_{it} = PROD_{it} - NPROD_{it.}$

Finally, as in Roychowdhury (2006), we estimate for each two-digit ISIC industry a model for "normal" discretionary spending levels:

$$\frac{DISEXP_{it}}{Assets_{i,t-1}} = \alpha_0 + \alpha_1 \frac{1}{Assets_{i,t-1}} + \beta_1 \frac{S_{it-1}}{Assets_{i,t-1}} + \varepsilon_{it}$$

where discretionary expenses (DISEXP) are defined as the sum of (a) advertising expenses, and (b) selling, general and administrative (SG&A) expenses.[44]

We require a minimum of 15 observations per regression in order to estimate "normal" levels of discretionary spending are defined using the fitted values from the regression estimates:

$$NDISEXP_{it} = \hat{\alpha}_1 \frac{1}{Assets_{i,t-1}} + \hat{\beta}_1 \frac{S_{it}}{Assets_{i,t-1}}$$

Abnormal discretionary spending levels are then simply defined as the difference between actual and "normal" discretionary spending levels: $ADISEXP_{it} = DISEXP_{it} - NDISEXP_{it.}$

Finally, we note that each one of these measures suffers from the potential lack of power of the cross-sectional regressions used to measure the non-discretionary portions of these items. Nonetheless, we follow the literature and implement those measures in order to detect potential real activities manipulation.

[44] Note that we should ideally add Research and Development (R&D) expenses to the measure, but we do not have this data item in our dataset.

II. Additional Results

Figure A1. Distribution of unscaled earnings before inflation adjustments and taxes (EBAT), inflation adjustments (IA) and earnings before taxes (EBT)

The top panel shows the distribution of earnings before adjustments and taxes (EBAT), the middle panel shows the distribution of inflation adjustments (IA) and the bottom panel shows both the observed and simulated distribution of earnings after inflation adjustments and before taxes (EBT). Note that EBAT + IA = EBT (i.e. the combination of the distributions shown in the top and middle panels results in the distribution in the bottom panel). The simulated distribution of EBT is run by drawing 10,000 bootstrap samples of the observed distributions of EBAT and IA, assuming that the distributions of EBAT and IA are independent. The resulting simulated distribution for EBT is shown in the bottom panel using a red line. All earnings are unscaled and in COP thousands. For ease of interpretation, distributions are bound between COP -200MM and COP +200MM. Partitions have a width of COP 2MM**.** The sample period ranges from 2003 to 2006 (pre-2007 sample).

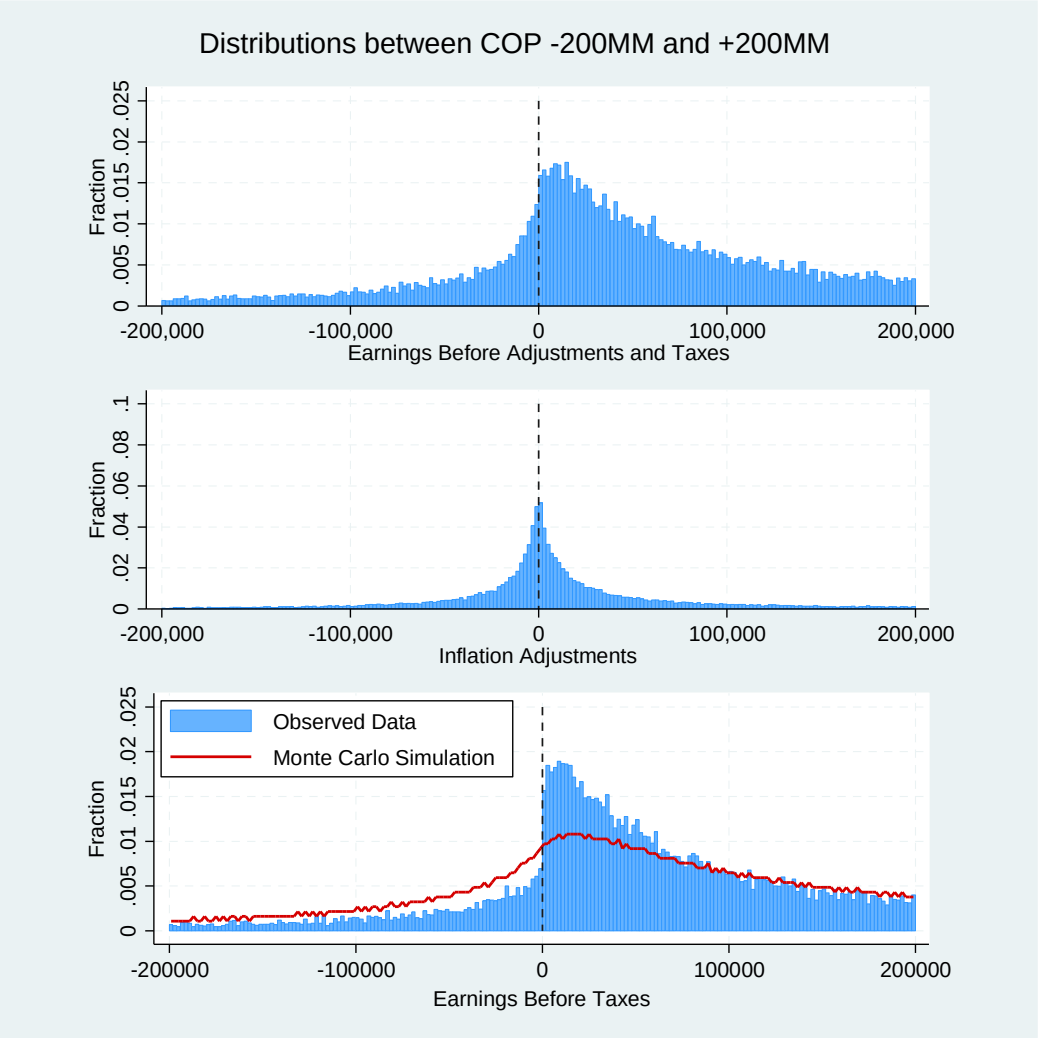

Figure A2. Distribution of earnings before inflation adjustments and taxes (EBAT) scaled by assets and the number of firms that cross the zero-earnings threshold

This figure shows in the distribution of EBAT scaled by assets. The vertical bar to the left of zero delineates the sample of "small loss" firms used in the tests in Table A.4. Bars in green highlight the number of firms within each bin in the range [-0.05, 0] that reported negative EBAT and that cross the zero-earnings threshold and report positive EBT through their use of IA.

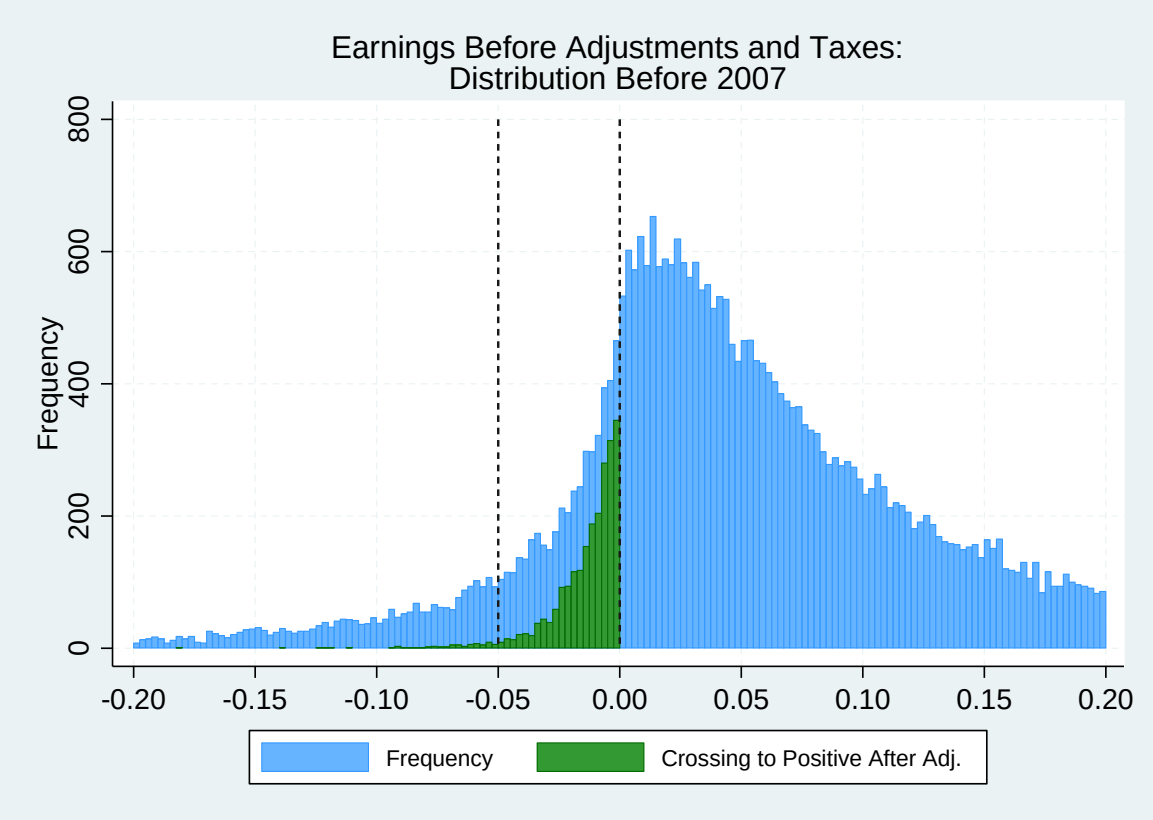

Table A1. Classification of balance sheet items under the IIA system

This table shows the classification of balance sheet items under the IIA system. Items labeled as "monetary" are not subject to inflation adjustments, while "non-monetary items" in the second column are subject to inflation adjustments.

	Monetary (Not subject to Inflation adjustments)	Non-Monetary (Subject to Inflation adjustments)
ASSETS		
Current Assets:		
Cash	X	
Short term investments	X	
Accounts Receivable	X	
Inventories		X
Long Term Assets:		
Deferred charges		X
Property, plant and equipment		X
Accumulated Depreciation		X
Intangible assets		
Paid for in a purchase transaction		X
Not paid for	X	
Long term investments		
Bonds	X	
Equity		X
LIABILITIES	X	
SHAREHOLDERS' EQUITY		
Capital		X
Capital in excess of par value		X
Legal reserve		X
Revaluation reserve		X
Retained earnings		X

Table A2. Simplified example of balance sheet and income statement adjustments for a given inflation adjustment factor

This table shows an example of how different balance sheet and income statement items are adjusted given an adjustment inflation factor. The base year is year 1 where for simplicity no inflation adjustments are made. In year two, an inflation factor of 6.0% is implemented, assuming no other changes in balance sheet and income statement. The last column shows the calculation of the inflation adjustment component for each non-monetary item that requires an adjustment.

	Year 1	Year 2	Inflation Adjustment
Inflation Adjustment Factor	-	6.0%	
BALANCE SHEET			
Cash	50.0	50.0	
PPE	200.0	212.0	200.0 * 6.0% = +12.0
Inventories	100.0	106.0	100.0 * 6.0% = +6.0
Total Assets	350.0	368.0	
Debt	100.0	100.0	
Capital	250.0	265.0	250.0 * 6.0% = +15.0
Retained Earnings	0.0	3.0	
Total Liabilities and Equity	350.0	368.0	
INCOME STATEMENT			
Revenues	200.0	200.0	
Costs	100.0	100.0	
SG&A	100.0	100.0	
Earnings before adjustments	0.0	0.0	
Net gain from inflation adjustments	0.0	3.0	18.0 - 15.0 = +3.0
Earnings after adjustments	0.0	3.0	

Table A3. Sample description: number of firms and observations by industry

This table reports the number of distinct firms and the number of observations by industry at the ISIC section level.

ISIC Section	Number of Firms	Number of Observations
A - Agriculture, hunting and forestry	1,594	7,035
B – Fishing	48	185
C - Mining and quarrying	388	1,518
D – Manufacturing	5,296	24,082
F – Construction	2,587	8,788
G - Wholesale and retail trade	8,850	34,890
H - Hotels and restaurants	518	2,172
I - Transport, storage and communications	1,120	4,237
K - Real estate, renting and business activities	4,616	17,561
M – Education	157	527
N - Health and social work	114	371
O - Other community, social and personal service activities	501	1,976
P - Activities of private households as employers of domestic staff	14	60
Total	25,803	103,402

Table A4. Firms required to have auditors: small loss firms vs. small profit firms: Cross-sectional tests of differences in inflation adjustments

This table tests for cross-sectional differences in the use of inflation adjustments (IA) by "small loss" and "small profit" firms, based on the requirement to have audited financial statements. Anonymous corporations, and all firms with sales in the preceding year above the equivalent of 5,000 minimum monthly wages are required to have audited financial statements (article 203 of Colombia's Commerce Code (*Código de Comercio*)). Limited liability corporations, limited liability partnerships, simplified stock companies, and collective corporations that have sales in the preceding year below the equivalent of 5,000 minimum monthly wages are *not* required to have an auditor. The indicator variable *Dummy Small Loss EBAT* takes a value of one if a firm has a small loss (scaled EBAT within [-2.5%; 0%]) in a given year and a value of zero if a firm has a small profit (scaled EBAT within [0%; +2.5%]). Small loss firms have been matched to small profit firms using a propensity score matching technique (see Table 3). The additional indicator variable *Dummy Auditor* takes a value of one if a firm is required to have an auditor. The interaction term *Dummy Small Loss EBAT* × *Dummy Auditor* tests for differences in the use of inflation adjustments across firms required and not required to have audited financial statements. We further control for remaining differences in firm characteristics by including firm-level covariates as well as industry and year fixed effects. Since IA are eliminated in 2007, only data before 2007 are used in these tests. Standard errors clustered by firm are reported in parentheses. ***, **, and * indicates significance at the 1%, 5% and 10% level, respectively.

	Dependent Variable: Inflation Adjustments / Assets			
	(1)	(2)	(4)	(3)
Constant	0.0080***	0.0112***	-0.0065**	-0.0060*
	(0.0008)	(0.0010)	(0.0030)	(0.0031)
Dummy Small Loss EBAT	0.0048***	0.0048***	0.0039***	0.0037***
	(0.0010)	(0.0010)	(0.0009)	(0.0009)
Dummy Auditor	-0.0003	-0.0006	-0.0022***	-0.0025***
	(0.0009)	(0.0009)	(0.0008)	(0.0008)
Dummy Small Loss EBAT × Dummy Auditor	-0.0007	-0.0006	0.0005	0.0008
	(0.0011)	(0.0011)	(0.0010)	(0.0010)
Ln of Assets			0.0006***	0.0005**
			(0.0002)	(0.0002)
Ln(Age)			-0.0017***	-0.0013***
			(0.0004)	(0.0004)
Fixed Assets / Assets			0.0162***	0.0183***
			(0.0011)	(0.0011)
Capex / Assets			-0.0005	-0.0012
			(0.0040)	(0.0039)
External Financing / Assets			0.0227***	0.0238***
			(0.0014)	(0.0015)
Debt / Assets			0.0016	0.0003
			(0.0019)	(0.0019)
Year FE	No	Yes	No	Yes
Industry FE	No	Yes	No	Yes
Observations	5,664	5,664	5,664	5,664
r2	0.0193	0.0781	0.205	0.257

Table A5. Matched sample statistics: small EBAT loss firms crossing to positive EBT vs. small EBAT loss firms *not* crossing to positive EBT:

This table presents the result of our matching procedure to explore the benefits of managing IA to cross to the positive side of the zero-earnings threshold (reported in Table 6). Observations in this subsample are all firm-years with small negative EBAT between -5% and 0% of beginning-of-year assets. Firms in the group "Crosses to Positive EBT After IA" cross the zero-earnings threshold and report *positive* EBT through the use of IA. Firms in the group "Remains Negative After IA" do *not* cross the zero-earnings threshold; they report small EBT losses after IA. Firms in the "Crosses to Positive EBT After IA" group are then matched to the group of "Remains Negative After IA" firms using a one-to-one, nearest neighbor matching estimator with replacement. Propensity score matching is performed year by year based on the set of firm characteristics reported in the table. Since IA are eliminated in 2007, only data before 2007 are used in these tests. Differences in means (*t*-test) between the unmatched and matched samples are performed and resulting p-values are reported.

	Unmatched Sample Means			Matched Sample Means		
	Crosses to Positive EBT using IA (Treatment)	Remains Negative using IA (Untreated)	*t*-test Diff. in means (p-values)	Treatment	Control	*t*-test Diff. in means (p-values)
EBAT / Assets	-1.31%	-2.47%	0.000	-1.31%	-1.27%	0.406
Total assets	15,134,372	18,726,720	0.303	15,134,372	15,934,270	0.728
External Financing / Assets	39.42%	28.71%	0.000	39.42%	38.64%	0.374
Debt / Assets	16.83%	12.30%	0.000	16.83%	15.67%	0.057
CapEx / Assets	1.81%	1.28%	0.013	1.81%	1.84%	0.868
PP&E / Assets	23.70%	21.99%	0.023	23.70%	21.79%	0.021
Number of Observations:	1,629	2,263		1,629	1,629	

Table A6. Matched sample statistics: small operating loss firms vs. small operating profit firms

This table presents summary statistics for the sample of firms just above (and below) the threshold of zero operating profits. "Small Operating Loss Firms" have operating profits between -2.5% and 0% of total assets. "Small Operating Profit Firms" have scaled operating profits between 0% and +2.5% and are matched to the sample of "Small Operating Loss Firms" using a one-to-one, nearest neighbor matching estimator with replacement. Propensity score matching is performed year by year based on the set of firm characteristics reported in the table. Data from 2003 to 2010 are used in this matching. Differences in means (t-test) between the unmatched and matched samples of "Small Operating Loss Firms" and "Small Operating Profit Firms" are performed and resulting p-values are reported.

	Unmatched Sample Means			Matched Sample Means		
	Small Operating Loss Firms (Treatment)	Small Operating Profit Firms (Untreated)	*t*-test Diff. in means (p-values)	Treatment	Control	*t*-test Diff. in means (p-values)
Total assets	16,688,400	22,643,337	0.408	16,688,400	22,658,096	0.969
Age	20.9	20.6	0.071	20.9	20.6	0.253
External Financing / Assets	27.35%	26.60%	0.000	27.35%	27.15%	0.605
Debt / Assets	10.76%	10.67%	0.029	10.76%	10.78%	0.705
CapEx / Assets	1.42%	1.79%	0.049	1.42%	1.64%	0.095
PP&E / Assets	21.38%	22.33%	0.014	21.38%	21.72%	0.356
Number of Observations:	7,341	13,442		7,341	7,341	