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Accounting and the Macroeconomy: The Case of Aggregate Price-Level Effects on Individual Stocks*

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Abstract

This study sheds new light on the cross-sectional effects of inflation, which have substantial implications for stock valuation. I use financial statement analysis to examine systematic stock-valuation effects of aggregate price-level changes on individual companies, focusing on the implications for both researchers and investment practitioners. I develop inflation-adjustment procedures that are straightforward for investors to implement in real time for extracting the inflation effect on individual companies. I find that inflation-based investment strategies conditioned on information available to investors as of the initial investment and rebalancing dates result in significant risk-adjusted returns. I also investigate the sources of abnormal returns to inflation-based investment strategies. Specifically, I estimate two separate components of the inflation effect on individual companies, one based on only monetary holdings (using the net position of monetary holdings) and the other based on only nonmonetary holdings. Investigating the stock-valuation implications of extracting the components-based inflation effect reveals striking evidence. In particular, investing based on the inflation effect on companies' net monetary holdings results in insignificant abnormal hedge returns. In contrast, investing based on the inflation effect on companies' nonmonetary holdings consistently yields economically and statistically significant abnormal hedge returns. These findings indicate that inflation-based abnormal hedge returns are driven not by the exposure of companies' net monetary holdings to inflation but, rather, by the exposure of their nonmonetary holdings to inflation. These results are consistent with the fact that companies' nonmonetary holdings are usually held for several years and thus accumulate inflationary effects over time whereas their monetary holdings are, on average, naturally hedged because the exposure of monetary assets cancels the exposure of monetary liabilities for the average company. In addition, I examine the direction of the stock returns to real-time investment strategies.

Keywords: Accounting; Aggregate Price Levels; Capital Markets; Financial Statement Analysis; Forecasting; Hedge; Inflation; Investment; Macroeconomics; Returns; Stock Valuation.

JEL Classification: E01; E02; E31; G23; M21; M41.

1 Introduction

Under U.S. generally accepted accounting principles (GAAP), financial statements (e.g., balance sheets and income statements) are nominal; that is, they are not adjusted for aggregate price-level changes in the dollar's purchasing power over time (e.g., Wilcox 2007; Palkar and Wilcox 2009; Konchitchki 2011). This approach leads to loss of information from U.S. financial statements because the purchasing power of the dollar does change over time, resulting in inflation. To illustrate, under U.S. GAAP, if the only activities of a company are purchasing a parcel of land for $100 60 years ago and purchasing an additional parcel of land for $100 1 year ago, the company recognizes the land purchases at $200 in its financial statements. The result is a loss of information because the two parcels were purchased at the same dollar amount but at different points in time and thus with money having different purchasing power. Therefore, although comparability is a key qualitative characteristic of accounting information, mixing dollars from different periods distorts the fundamental accounting assumption of constant purchasing power that underlies financial statements and thus impairs comparability across companies and over time. This outcome raises questions as to the economic significance of such inflation effects.

Nominal financial statements do not account for aggregate price-level changes in purchasing power over time, which leads to unrecognized inflation effects that vary across companies and over time. Inflation effects can have major implications for investors. Consider the effect of inflation on monetary holdings. Companies' monetary holdings have lately been the subject of debate among both practitioners and academics. A recent growing concern is that many corporations are accumulating billions of dollars in cash and other liquid monetary assets (short-term securities that can easily be converted into cash) without investing those amounts or otherwise benefiting investors.

For instance, in February 2013, Apple was sued by hedge fund billionaire David Einhorn for piling up cash rather than using it to benefit investors. Using Compustat data for all U.S. public corporations as of fiscal year-end 2012, I conduct an aggregate-level cash-holdings analysis and find that U.S. corporations were holding $4.7 trillion (of which nonfinancial corporations were holding $1.6 trillion) in aggregate liquid assets. For companies with such high cash holdings, inflation can have a major destructive effect. Notably, in the cross-section, inflation affects companies differently, depending on differences in the structure of companies' assets and liabilities.

Konchitchki (2011) provides both theory and evidence for a positive association between inflation gains and losses and future cash flows from operations (CFO), suggesting that inflation effects are realized in future cash flows.[1] Investors may fully impound inflation's implication for future cash flows when valuing stocks. However, using inflation-adjusted data can be costly because such data are not reported in financial statements and processing inflation-adjusted data is more complicated than processing nominal data (Beaver and Landsman 1983). Because mispricing can arise when information is costly to obtain and process, investors may not fully impound the implications of inflation information for future cash flows.

In this study, I investigate the extent to which inflation effects available in real time can generate significant abnormal returns and the sources of such returns. I use three return metrics to examine abnormal returns for inflation-based investment strategies—namely, returns adjusted for the Fama–French, Fama–French–Carhart, and Fama–French–Carhart–*RNOA* factors—as detailed later in the study. I begin by using financial statement analysis to investigate how inflation distorts nominal amounts. To do so, I first extend Konchitchki (2011) by developing simple procedures to extract inflation-adjusted data from a company's nominal financial statements. Next, I use inflation-based investment strategies motivated by the idea that inflation affects companies differently in the cross-section. Importantly, these investment strategies are conditioned on information available as of the initial investment and rebalancing dates.

Using a comprehensive sample of U.S. publicly traded companies with fiscal year-ends between 1984 and 2012 (a period of relatively low inflation) and future stock returns as of March

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[1] Inflation can affect future CFO because, for example, higher inflation gains accumulated in nonmonetary assets can result in higher future CFO when the assets are used (in the case of property, plant, and equipment) or sold (in the case of inventory). Further, because inflation is correlated with changes in specific prices, predicting higher future CFO from increases in the general price index is consistent with prior evidence that increases in specific prices result in higher CFO (e.g., Aboody, Barth, and Kasznik 1999). Indeed, my untabulated results suggest that monthly inflation rates are highly and significantly correlated with monthly changes in major indices of nonmonetary assets (commodities and housing), with Spearman and Pearson correlations as high as 70% for the past six decades of available data in the Global Insight database.

2013, I find that these inflation-based investment strategies result in substantial risk-adjusted returns in a time-consistent manner.

Because adjusting all accounting amounts can be costly, a components-based adjustment procedure may have lower implementation costs and thus may be of greater benefit than a procedure based on all accounting amounts. Accordingly, I develop additional inflation adjustment procedures to estimate two separate components of the inflation effect on individual companies, one based on only monetary holdings (using the net position of monetary holdings) and the other based on only nonmonetary holdings (by subtracting the inflation effect on the net monetary position from the total inflation effect). Following Konchitchki (2011), I conduct cash flow prediction tests and find that (1) the magnitude of the coefficients on monetary versus nonmonetary holdings varies across the two components and (2) the nonmonetary component effect on future cash flows is higher and more significant than the effect of the monetary component.

I then investigate the stock-valuation implications of the two components of the total inflation effect. In particular, using companies' net monetary holdings and nonmonetary holdings, I separately examine abnormal returns to investment strategies. Strikingly, I find that investing based on the inflation effect on companies' net monetary holdings consistently yields insignificant abnormal hedge returns, whereas investing based on the inflation effect on companies' nonmonetary holdings consistently yields economically and statistically significant abnormal hedge returns. These findings indicate that inflation-based abnormal hedge returns are driven not by the exposure of companies' net monetary holdings to inflation but, rather, by the exposure of their nonmonetary holdings to inflation. The results are consistent with the fact that companies' nonmonetary holdings are usually held for several years and thus accumulate inflation gains and losses over time whereas companies' monetary holdings, on average, are naturally hedged because the exposure of monetary assets cancels the exposure of monetary liabilities for the average company. The findings also suggest that all components should be adjusted and that using only companies' monetary holdings is insufficient for achieving the benefits of inflation-based investment strategies.

Next, I examine the direction of the stock returns to the investment strategies. Specifically, I investigate the evidence of a negative relation between inflation effects and future abnormal returns. I find that this negative relation is robust and attributable not to the balance sheet bloat of Hirshleifer et al. (2004) but, rather, to unrecognized inflation effects.

This study makes four significant contributions to capital market research. First, it contributes to the literature on how inflation affects stock valuation. Spanning several decades, prior related research focuses overwhelmingly on aggregate effects—that is, how inflation affects the aggregate stock market. The major conclusion of this research is that the aggregate stock market is negatively correlated with inflation (e.g., Bodie 1976; Fama and Schwert 1977; Fama 1981). Common inferences from this line of research are that (1) the stock market tends to perform poorly in inflationary periods and (2) stocks are a poor hedge against inflation. In my study, I find that focusing on the aggregate stock market masks considerable heterogeneity in the way inflation affects individual stocks. If one takes into account that inflation affects companies differently in the cross-section owing to companies' different asset and liability structures (e.g., cash versus land), inflation has a substantial effect on stock valuation. Accordingly, whereas the key conclusion from prior research at both the aggregate level and the company level is that ex ante use of stocks is a poor hedge against inflation (see, e.g., Bodie 1976; Fama and Schwert 1977; Fama 1981; Ang, Brier, and Signori 2012), I find that sorting individual stocks on the basis of their ex ante exposure to inflation results in significant hedge returns. Specifically, I find that by investing in individual stocks or forming portfolios on the basis of company-specific exposure to inflation conditioned on information that is available to investors in real time, one can extract significant abnormal hedge returns in a time-consistent manner. Overall, I find that investigating the effect of inflation on companies' mix of assets and liabilities—on a company-by-company basis rather than on the aggregate stock market—can be beneficial for stock-hedging activities.[2]

[2] Investing in portfolios of stocks with different degrees of exposure to inflation, rather than in the entire stock market, can improve inflation-risk hedging. Note that isolating company-specific inflation effects allows investors to extract information stemming from substantial heterogeneity across companies—heterogeneity that is lost when pooling all companies together in a market index.

Second, this study contributes to the literature on the implications of earnings adjusted for inflation (e.g., Ritter and Warr 2002; Wilcox 2007; Palkar and Wilcox 2009). Prior related research often

(1) adjusts earnings for a partial inflation effect—for example, Ritter and Warr (2002) focuses on inflation illusion and thus on the debt capital gain error stemming from adjusting nominal debt);

(2) investigates inflation-adjusted (real) earnings at the aggregate level—for example Wilcox (2007) uses aggregate earnings data from NIPA (the National Income and Product Accounts published by the U.S. Bureau of Economic Analysis) and shows that the adjusted-earnings-yield measure is better at predicting future real returns than other popular valuation measures); or

(3) does not focus on future hedge returns to ex ante investment strategies (e.g., Wilcox 2007).

In contrast, in this study I focus on extracting company-level (rather than aggregate) inflation effects by using earnings from financial statements, taking into account the entire effect of inflation on both monetary and nonmonetary holdings, and investigate future hedge returns for ex ante inflation-based investment strategies.

Third, this study contributes to the literature on inflation accounting. Conducted mainly in the late 1970s and early 1980s, when inflation was relatively high, prior related research addresses questions concerning short-term inflation effects—short-window event studies or contemporaneous association with stock returns. This research finds that inflation-adjusted accounting data are of no consequence to financial decision making (e.g., Beaver, Christie, and Griffin 1980; Watts and Zimmerman 1980; Beaver, Griffin, and Landsman 1983). In contrast, I focus on the long-run effects of inflation, given that inflation affects companies over time. Thus, I take a different, forward-looking approach by considering the possibility that inflation may have implications over a period longer than one year. By focusing on future inflation effects, I shed light on the extent to which stock market investors incorporate inflation information and the related stock-valuation implications. I also extend prior research (Konchitchki 2011) by developing new inflation-adjustment procedures, by offering real-time investment strategies, and by providing new insights into the sources of inflation-based abnormal returns and the direction of the returns to the investment strategies. In addition, this study offers new evidence of significant implications of inflation for stock valuation even when inflation is relatively low, providing researchers with a forward-looking mechanism to investigate links between current-period accounting data and future economic activity, including future stock returns.

Finally, this study contributes to company- and aggregate-level research that has combined accounting and macroeconomic data to investigate the informativeness of accounting for economic performance[3] and that has used financial statement analysis to forecast economic performance.[4] This study sheds new light on the informativeness of accounting and aggregate price-level data for stock valuation by using financial statement analysis of real-time data and identifying the sources of any stock misvaluations.

Although obtaining and processing information on inflation effects for individual companies is costly, the inflation-adjustment analysis that I introduce reduces the implementation costs. Given the high benefits and low costs, the investment community may gradually adopt the inflation-based investment strategies that I develop, whereby case evidence of the predictability of future abnormal returns based on inflation-adjusted data may dissipate over time. At a minimum, the evidence in this study highlights that financial statement analysis of accounting data based on aggregate price levels provides a signal that correlates with incrementally useful information for forecasting stock valuation in real time.

2 Extracting Cross-Sectional Effects of Inflation on Individual Companies

I extend Konchitchki (2011) and develop procedures for extracting individual companies' unrecognized periodic inflation effects. Nominal financial statements do not account for aggregate price-level changes in purchasing power over time; the erosion of a company's

[3] For example, see Chordia and Shivakumar 2005; Kothari, Lewellen, and Warner 2006; Ball, Sadka, and Sadka 2009; Hirshleifer, Hou, and Teoh 2009; Shivakumar 2010; Konchitchki 2011; Kothari, Shivakumar, and Urcan 2012; Li, Richardson, and Tuna 2012; Konchitchki and Patatoukas 2014a, b, c.
[4] For example, see Ou and Penman 1989; Lev and Thiagarajan 1993; Abarbanell and Bushee 1998; Nissim and Penman 2001; Konchitchki 2011; Patatoukas 2012; Curtis, Lundholm, and McVay 2013. See also Penman 2013; Subramanyam 2013.

monetary assets (e.g., cash) and liabilities (e.g., debt) results in losses and gains, respectively. Also, although inflation-adjusted amounts of nonmonetary holdings (for example, land) accumulate inflationary effects over time to reflect changes in purchasing power, these effects are not recognized in nominal financial statements. The difference between inflation-adjusted earnings and nominal earnings represents the inflation effect on a company. For example, financial companies are exposed to inflation losses because they hold substantial amounts of monetary assets in nominal loans that drop in real value when inflation increases. Accordingly, the financial industry is likely to show the weakest inflation-hedging abilities. Indeed, Ang et al. (2012) provided evidence that the financial sector exhibits the weakest inflation-hedging abilities.

To extract the effects of inflation, I first separate financial statement holdings into two classes that are exposed to inflation differently: monetary and nonmonetary. I capture the difference between inflation-adjusted earnings and nominal earnings (obtained directly from financial statements) through *InfEffect*, which reflects the unrecognized periodic inflation effect on a company. Variation in *InfEffect* is a function of the level of inflation, changes in inflation, and differences across companies and over time in the structure of monetary and nonmonetary holdings. As a result, companies' inflation-adjusted outcomes can differ even when they have similar nominal outcomes, and a company's inflation-adjusted outcomes can vary over time even when the nominal amounts remain constant. By adjusting for inflation, I am able to state financial statement amounts (including property, plant, and equipment, or PPE) in common units and in an objective manner. Thus, I use the same system of accounting that underlies the current U.S. nominal reporting regime and did not attempt to adjust for fair values. I also adjust nominal financial statements by allowing the inflation effects to vary across companies and over time, thereby capturing the fact that inflation affects companies differently in the cross-section.[5]

Because adjusting all accounting amounts can be costly, a components-based adjustment procedure may have lower implementation costs and thus may be of greater benefit than a procedure based on all accounting amounts. A components-based adjustment procedure can also

[5] To conserve space, a supplementary Appendix that provides a detailed discussion of the procedure for adjusting all accounting amounts—both monetary and nonmonetary holdings—to obtain inflation effects on individual companies can be downloaded from my website (https://sites.google.com/site/ykonchit), below the title of this study.

shed light on whether investors should distinguish between the monetary and nonmonetary components of inflation effects. Accordingly, I next develop additional inflation-adjustment procedures to estimate two separate components of *InfEffect*—one based on only monetary holdings and the other based on only nonmonetary holdings. To estimate the monetary component (*InfEffect_NetMonetary*), I obtain the net position of monetary holdings for each company-year observation in the sample and multiplied it by the annual inflation rate:

$$InfEffect\_NetMonetary = -\left(NetMonetaryHolding\right)\left(\pi_t\right), \quad (1)$$

where π_t is the annual inflation rate associated with the fiscal year of the company-year observation (e.g., π_t is the trailing annual inflation rate that ends in November for a company with a November fiscal year-end) and *NetMonetaryHolding* is monetary assets minus monetary liabilities.[6] The minus sign is included to reflect gains or losses. For example, a positive net monetary position reflects more monetary assets than monetary liabilities, and thus, the inflation effect is a loss and should be negative. To estimate the nonmonetary component, I subtract the monetary component of inflation from the total effect of inflation on a company (i.e., *InfEffect*):

$$InfEffect\_NonMonetary = InfEffect - InfEffect\_NetMonetary. \quad (2)$$

Following Konchitchki (2011), I conduct cash flow prediction tests to shed light on the benefits of using a components-based adjustment procedure. In particular, I investigate the predictability of future cash flows by using the monetary and nonmonetary components of inflation effects. The results, untabulated for brevity, show that the magnitude of the coefficients on monetary and nonmonetary holdings varies across the two components. Further, the effect of

[6] *NetMonetaryHolding* can be calculated by using two alternative definitions. The first definition is straightforward: *NetMonetaryHolding* = Current assets (Compustat: CA) – Inventories (Compustat: INVT) – Total liabilities (Compustat: LT + MIB). The second definition is less straightforward but consistent with the algorithm (e.g., it treats as monetary other monetary items that are in stockholders' equity but are not in retained earnings): *NetMonetaryHolding* = Total assets (Compustat: AT) – Nonmonetary assets [Net PPE (Compustat: PPENT) + Inventories (Compustat: INVT) + Intangibles (Compustat: INTAN)] – Total liabilities (Compustat: LT + MIB) – Other monetary, where Other monetary is other monetary items in stockholders' equity but not in retained earnings. Other monetary = Total assets (Compustat: AT) – Total liabilities (Compustat: LT + MIB) – Retained earnings excluding other comprehensive income effect [Retained earnings (Compustat: RE) – Accumulated other comprehensive income (Compustat: ACOMINC)] – [Common stock (Compustat: CSTK) + Preferred stock (Compustat: PSTK) + Capital surplus (Compustat: CAPS)]. To obtain *NetMonetaryHolding* with either definition, I scale by the same deflator used to deflate *InfEffect* (Total assets, Compustat: AT). In the reported analyses, I use the second definition to be consistent with the algorithm, but both definitions result in unchanged inferences.

the nonmonetary component on future cash flows is stronger and more significant than the effect of the monetary component. The finding that the magnitude of the coefficients on monetary and nonmonetary assets varies across the two components is consistent with inflationary GAAP and highlights the need to distinguish between the two components when adjusting for inflation. These findings further indicate that the result reached in prior research (Konchitchki 2011) regarding the cash flow predictability of overall inflation effects is driven more strongly by the nonmonetary component.

In my empirical analyses (discussed later in the article), I explore the implications of the two components of *InfEffect* for future abnormal hedge returns. In particular, I separately examine abnormal hedge returns to inflation-based investment strategies by using companies' inflation effects related to net monetary holdings (*InfEffect_NetMonetary*) and nonmonetary holdings (*InfEffect_NonMonetary*).

3 Real-Time Inflation-Based Investment Strategies

This section provides guidance to investment practitioners on the use of inflation-based investment strategies. If mispricing exists, a relation between inflation effects and future returns is likely to be evident in future returns to investment strategies. To test this conjecture, I conduct asset-pricing tests to examine future returns to two strategies constructed on the basis of inflation-adjusted information, controlling for common risk factors. The investment strategies are ex ante and are thus based on information available in real time as of the investment and rebalancing dates. If investors fully incorporate information regarding the future cash flow effects of inflation, stock prices should be correctly priced, leading to no future abnormal returns. In contrast, if investors do not fully incorporate information about the effects of inflation, stocks may be mispriced, leading to possible future abnormal returns.

Real-Time Strategy 1.

Each year, I first sort observations into deciles on the basis of *InfEffect*, the unrecognized periodic inflation effect on the company, whereby the lowest (highest) decile composes Portfolio 1 (10). Then, for each portfolio-year, I construct mean abnormal returns over the subsequent year, beginning three months after the fiscal year-end. Because the inflation effects are estimated annually, I align companies' *InfEffect* with monthly returns over the 12 months beginning 3 months after the fiscal year-end of year *t*, allowing time for dissemination of information in annual reports for year *t* and the associated annual inflation rate required to estimate *InfEffect* for year *t*.

I use three return metrics to examine abnormal returns for the investment strategies—namely, returns adjusted for the Fama–French, Fama–French–Carhart, and Fama–French–Carhart–*RNOA* factors. The Fama–French factors refer to the *MKTRF*, *SMB*, and *HML* factors of Fama and French (1993), and the Carhart factor refers to the momentum factor (*UMD*) of Carhart (1997). As an additional control, I add *RNOA*, a factor based on the net operating assets (*NOA*) of Hirshleifer et al. (2004), who provided evidence that the ratio of net operating assets to lagged total assets, which they refer to as balance sheet bloat, is associated with future returns. I account for this effect in all return tests to control for the possibility that a relation between *NOA* and *InfEffect* could affect the association between *InfEffect* and future returns. To do so, I obtain *NOA* by following Hirshleifer et al. (2004) and then formed the *NOA*-based factor *RNOA* by following the procedure described in Fama and French (1993) for forming their *HML* and *SMB* factors. Thus, the *RNOA* factor refers to returns to a factor-mimicking *NOA* portfolio based on Hirshleifer et al. (2004).[7]

To obtain abnormal returns, I first calculate raw returns by annually compounding each company's monthly returns. Then, for each company, I estimate time-series regressions of company monthly returns on the Fama–French, Fama–French–Carhart, and Fama–French–

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[7] Following Hirshleifer et al. (2004), I obtain *NOA* as $NOA = RawNOA/TotalAssets_{t-1}$, where *RawNOA* = Operating assets – Operating liabilities; Operating assets = Total assets (Compustat: AT) – Cash and short-term investment (Compustat: CHE); and Operating liabilities = Total assets (Compustat: AT) – Debt included in current liabilities (Compustat: DLC) – Long-term debt (Compustat: DLTT) – Minority interests (Compustat: MIB) – Preferred stocks (Compustat: PSTK) – Common equity (Compustat: CEQ). Next, I form *RNOA*, an *NOA*-based factor, by following Fama and French (1993). At the end of each month, I sorted all observations into two *NOA* groups, with Group 1 (2) including observations with low (high) *NOA*, and three book-to-market (*BTM*) groups, with Group 1 (3) including observations with low (high) *BTM*. I then construct six portfolios (L/L, L/M, L/H, H/L, H/M, H/H) from the intersections of the two *NOA* groups and the three *BTM* groups, with the first letter in each X/X combination referring to the *NOA* portfolio (low, high) and the second letter referring to the *BTM* portfolio (low, medium, high). I then calculate monthly value-weighted returns on the six portfolios over the subsequent year, beginning three months after the fiscal year-end. I calculate *RNOA* for each month as the average of the monthly returns on the three high-*NOA* portfolios (H/L, H/M, H/H) minus the average of the monthly returns on the three low-*NOA* portfolios (L/L, L/M, L/H).

Carhart–*RNOA* factors. These regressions yielded company-specific betas ($\beta_{i,MKTRF}$, $\beta_{i,SMB}$, $\beta_{i,HML}$, $\beta_{i,Momentum}$, and $\beta_{i,RNOA}$), which I winsorize at the top and bottom 1% (to be clear, each set of company betas is based on a time-series regression for that company using the factors added in that regression). I obtain abnormal returns by subtracting from raw returns the product of a company's betas and the respective factor returns, compounded annually. Throughout the study, I estimate regression models using ordinary least squares regressions, and when reporting results, I consider *p*-values of 5% or lower significant, using two-sided statistical tests.

Real-Time Strategy 2.

The second investment strategy focuses on the intercepts (alphas) of portfolios constructed on the basis of the inflation effects. The estimated intercepts allow one to test the ability of inflation information to explain systematic differences in the cross-section of stock returns, controlling for common risk factors. I test whether the intercept for the low-*InfEffect* portfolio is significantly different from the intercept for the high portfolio. First, for each company-year observation, I construct the return over the 12 months beginning 3 months after the fiscal year-end (as before, I align companies' annual amounts with monthly returns over the 12 months beginning 3 months after the fiscal year-end). Second, I construct decile portfolios such that for each period, all company-year observations with the lowest (highest) *InfEffect* were sorted into Portfolio 1 (10), rebalanced monthly. Third, I calculate average portfolio excess returns ($R_{p,m} – R_{f,m}$) for each month *m*, using all observations in each portfolio, and estimate time-series monthly portfolio regressions by regressing the monthly portfolio excess returns on the Fama–French factors, sequentially adding the momentum and *RNOA* factors as controls. The intercepts from these regressions are the portfolio alphas, which are of major interest for evaluating investment returns (e.g., Fama and French 1993; Konchitchki 2011; Konchitchki and O'Leary 2011; Barth, Konchitchki, and Landsman 2013; DeFond, Konchitchki, McMullin, and O'Leary 2013).

To test for abnormal hedge returns to this inflation-based investment strategy, I conduct statistical tests on the difference between the highest and lowest portfolios by regressing zero-cost (i.e., self-financed) investment hedge portfolio returns—obtained by longing the lowest portfolio and shorting the highest portfolio—on the related-period factors. The intercept from this zero-cost hedge regression is the monthly abnormal return on a zero-cost inflation-based hedge strategy that buys the lowest portfolio and sells short the highest portfolio.

Timeline of Analysis.

I adjust for inflation amounts of year *t* by using the nominal amounts and inflation time-series rates through the end of year *t*. Thus, inflation effects are known at the end of year *t* and investors have this information before *t* + 1 abnormal returns begin to accumulate. The association between current-period inflation effects and subsequent abnormal returns therefore depends on how the expected and unexpected components of *InfEffect* are estimated.

The source of the surprise that drives future returns—that is, the unexpected component of *InfEffect* at time *t* (and thus the unexpected cash flow at *t* + 1)—is the difference between *InfEffect* estimated by taking inflation into account and not fully adjusting for inflation (as explained in Konchitchki 2011). Similar to the earnings surprise literature, the source of this study's surprise is the difference between inflation-adjusted amounts and nominal amounts that ignore the monetary–nonmonetary distinction.[8] This type of analysis is analogous to that in Sloan (1996), who examines whether investors adequately distinguish the difference in persistence between the cash flow and accrual components of earnings in predicting future earnings.[9] Also, the use of future abnormal returns to infer the expected and unexpected components of inflation

[8] Therefore, what leads to future abnormal returns is whether investors understand the differential effect of inflation on monetary versus nonmonetary assets, rather than their understanding of expected versus unexpected inflation—which is different from investors' failure in the current period to distinguish between expected and unexpected inflation. Specifically, when I estimate inflation-adjusted amounts, actual inflation is known because it is realized. Whether actual inflation is fully anticipated does not affect my predictions because investors use actual inflation, rather than its expected or unexpected components, to derive *InfEffect*. Further, although the distinction between expected and unexpected inflation is important when examining how changes in current-period earnings explain contemporaneous stock price changes, under the notion that stock prices respond to unexpected inflation during the year (a setting widely used in the research design of inflationary accounting studies during the 1970s and 1980s), my motivation and design are forward-looking. That is, in my study, the events flow such that current-period (year *t*) *InfEffect* is estimated first, and only in the subsequent period (*t* + 1) does this effect turn into cash flows. The subsequent returns thus do not arise from unexpected inflation that affects year *t InfEffect*.

[9] To the extent that inflation effects are perfectly correlated over time, there may be no surprise component when these inflation effects turn into cash flows over time, and thus, there may be no theoretical link between *InfEffect* and future returns. However, when I calculate serial correlations in *InfEffect* over years *t* and *t* + 1, I find Pearson and Spearman correlations as high as 30%. These correlations indicate that inflation effects exhibit only weak persistence over time because they have low serial correlation. Thus, there is no systematic relation in *InfEffect* over time. These results are consistent with my expectation that inflation effects are likely to change over time because of the large variation in the composition of companies' monetary and nonmonetary items over time.

effects is consistent with prior research (e.g., Sloan 1996; Konchitchki, Lou, Sadka, and Sadka 2013). For example, similar to Sloan (1996), who infers the expected and unexpected persistence of accruals and cash flows by examining future abnormal returns, I infer the expected and unexpected components of inflation effects (which lead to a future surprise when inflation affects future cash flows) by examining the patterns in future abnormal returns.

4 Data

I use all U.S. stocks in the intersection of CRSP and Compustat data available to calculate inflation effects with fiscal year-ends between 1984 and 2012 and future stock returns available as of March 2013. Because my analyses required future returns, the portfolio construction period runs from 1984 to 2011 (*n* = 28). I choose 1984 as the sample's beginning year to capture a period when inflation was relatively low (averaging 3%). I obtain the risk-free rate and monthly factors from the Fama–French Portfolios & Factors dataset (available from Wharton Research Data Services, or WRDS) and the nominal accounting variables from the Compustat North America Fundamentals Annual database.

I obtain data on consumer price indices for the inflation-adjustment procedure from the Consumer Price Index for All Urban Consumers: All Items (CPIAUCSL), which is part of the FRED Economic Data of the Federal Reserve Bank of St. Louis. In a sensitivity test, I also use real-time inflation realization data from the Survey of Professional Forecasters (SPF), available from the Real-Time Data Set for Macroeconomists of the Federal Reserve Bank of Philadelphia; applying this sensitivity test, I find that my inferences were unchanged. I obtain raw stock returns from the CRSP Monthly Stock File and adjusted for delisting returns following Shumway and Warther (1999) and Beaver, McNichols, and Price (2007); my inferences were unchanged when I did not adjust for delisting returns.

A key variable of interest is *InfEffect*, the unrecognized periodic inflation effect on a company, defined as inflation-adjusted earnings minus nominal earnings (scaled by total assets).[10] To mitigate the effects of penny stocks, I omit stocks with a stock price below $1. To ensure data availability and to avoid extreme values obtained from either deflating by a small

[10] This definition is explained in the supplementary material, which can be downloaded from my website.

denominator or using a negative book value of equity, I delete observations with total assets, total revenues, or a market value of equity below $10 million (from CRSP and Compustat); observations with a negative book value of equity; and missing observations. The final sample comprised 66,603 U.S. company-year observations.

5 Empirical Results

I report my findings regarding abnormal returns to inflation-based investment strategies based on the overall inflation effect on companies, abnormal returns using components-based inflation adjustments, and additional analyses.

Abnormal Returns to Inflation-Based Investment Strategies Based on Overall Inflation Effect.

Table 1 reports results from estimating annual company abnormal returns for the year following portfolio construction, summarized across all companies in each year as well as across all companies and years for Strategy 1. The results reveal that inflation information generates significant abnormal returns. The key results are that (1) the mean hedge returns across the three return metrics are significant and vary between 10.97% and 12.36% per year and (2) the abnormal returns to a hedge strategy are positive in 26 of the 28 sample years considered.

Table 2 reports my results from estimating time-series monthly portfolio regressions for Strategy 2. The key results are that (1) the zero-cost hedge returns on the difference between Portfolios 1 and 10 are significant and vary between 91 bps and 95 bps a month, indicating an annual zero-cost abnormal return (compounded monthly) of 11.51% to 12.03%, and (2) the significant hedge returns hold when controlling for momentum and *RNOA* factors in addition to the three Fama–French factors. These results suggest that forming portfolios on the basis of inflation effects on individual companies generates significant abnormal returns. The strong and significant portfolio and hedge alphas reveal that, in addition to other commonly known factors, inflation-based systematic effects play an important role in explaining differences in returns of companies sorted on the basis of their company-specific inflation exposures.

Taken together, the findings in Tables 1 and 2 of significant future abnormal returns to different inflation-based investment strategies provide consistent evidence that inflation-adjusted information is not fully impounded when valuing stocks. Using information about inflation effects on individual companies can thus provide high rewards to investors. In particular, investors can benefit from the inflation-based investment strategies by generating substantial abnormal returns because these strategies are ex ante and thus conditioned on information known as of the investment and rebalancing dates.

Abnormal Returns Using Components-Based Inflation Adjustments.

Table 3 reports results from my analyses using inflation-based adjustment procedures to extract inflation effects on companies' net monetary (Panel A) and nonmonetary (Panel B) holdings of assets and liabilities. As in Table 1, the first part (from left to right) of each panel shows the results from estimating annual company abnormal returns for the year following portfolio construction, with the returns summarized as the mean across all company-years. The second part (from left to right) of each panel shows the results from estimating time-series monthly portfolio regressions as in Table 2.

Two key results emerge from Table 3. First, investment strategies based on the effects of inflation on companies' net monetary holdings (*InfEffect_NetMonetary*) consistently yield abnormal hedge returns that are insignificantly different from zero, although some are marginally significant for the monthly portfolio tests. Second, investment strategies based on the effects of inflation on companies' nonmonetary holdings (*InfEffect_NonMonetary*) consistently yield economically and statistically significant abnormal hedge returns. These findings suggest that inflation-based abnormal hedge returns are driven not by the exposure of companies' net monetary holdings to inflation but, rather, by the exposure of their nonmonetary holdings (e.g., fixed assets, such as PPE). The results are consistent with the fact that companies' nonmonetary holdings are usually held for several years and thus accumulate inflation gains and losses over time, whereas their monetary holdings are, on average, naturally hedged because the exposure of monetary assets to inflation cancels the exposure of monetary liabilities for the average company.[11] These findings suggest that all components should be adjusted and that using only companies' monetary holdings is insufficient for extracting the benefits of inflation-based investment strategies.

Additional Analyses.

I next investigate the direction of the stock returns to the real-time investment strategies and checked that *InfEffect*—and not the balance sheet bloat of Hirshleifer et al. (2004)—is what leads to the negative relation between *InfEffect* and future returns that I document. To do so, I first sort all observations into five *NOA* portfolios and five *InfEffect* portfolios and obtained abnormal returns for each intersected portfolio. I then estimate a predicted trend regression model by regressing a company's abnormal return on the particular *InfEffect* portfolio (and an intercept).

The results, reported in **Table 4**, show that the negative return pattern across *InfEffect* portfolios persists in each of the *NOA* portfolios, with a significant negative trend (i.e., the slope coefficient from the trend regression) in all *NOA* portfolios. These results provide additional evidence that the return distribution observed earlier—that is, the negative relation between *InfEffect* and future returns—is driven by inflation effects and not balance sheet bloat.

These findings suggest (1) the existence of future abnormal returns to inflation-based strategies and (2) a negative association between *InfEffect* and future abnormal returns. Thus, investors appear to estimate *InfEffect* incorrectly because otherwise, the future realization of inflation gains in cash flows would not be unexpected and hence no future abnormal returns would be predicted. However, investors do not appear to ignore the inflation effects completely; if investors completely ignored the inflation effects, the entire future realization of inflation gains in cash flows would be unexpected, leading to a future positive surprise when inflation gains are realized and thus a predictable positive association between *InfEffect* and future abnormal returns. This is because the higher the (ignored) inflation gains, the more favorable the future cash flows relative to investors' expectations. This finding raises the question whether in

[11] Indeed, I examine the mean and median *InfEffect_NetMonetary* and find that they are indistinguishably different from zero (absolute values less than 0.001), indicating that monetary assets are approximately equal to monetary liabilities for the average company over the sample period.

attempting to adjust for inflation, investors make errors. Prior studies have indicated that investors "fixate" on aggregate amounts without distinguishing between the components of the aggregate amounts. For example, Sloan (1996) provided evidence consistent with investors' fixating on aggregate earnings, failing to distinguish between the earnings' accrual and cash flow components and their different implications for future performance.

Similarly, because inflation affects monetary and nonmonetary assets differently, stock prices are likely to be affected if investors rely on aggregate amounts rather than distinguish between their different components. Indeed, Konchitchki (2011) compares inflation-adjusted earnings estimated with and without distinguishing between the monetary and nonmonetary components of inflation and find that the error from not fully incorporating the effects of inflation is associated with the documented pattern of future abnormal returns. Thus, the negative association between inflation effects and future abnormal returns that I document in this study is predictable and consistent with an inflation-adjustment argument whereby investors do not distinguish between monetary and nonmonetary assets.[12,13]

6 Conclusion

[12] Note that the return results are distinct from, and cannot be explained by, inflation illusion. The inflation illusion hypothesis (Modigliani and Cohn 1979) posits that highly levered companies are more undervalued owing to investors' failure to incorporate gains accruing from purchasing power depreciation of nominal liabilities, or what Ritter and Warr (2002) refer to as the "debt capital gain error" (see also Wilcox 2007). Because the erosion of nominal liabilities leads to higher inflation gains, the direct effect of the inflation illusion hypothesis is higher (lower) future abnormal returns when inflation gains are high (low) because investors who suffer from inflation illusion are positively (negatively) surprised over future periods. Despite the offsetting effect of inflation illusion on my findings from the return analyses, however, my results are incremental to the inflation illusion effect because I find that future abnormal returns are negatively related to inflation gains. The inflation illusion hypothesis also posits that investors irrationally discount inflation-adjusted cash flows by using nominal interest rates. In contrast, here I investigate how inflation directly affects cash flows instead of how cash flows are discounted.

[13] In two additional tests, untabulated for brevity, I find the following. First, there is no evidence of a pattern in risk characteristics across portfolios sorted on companies' inflation effects and that an inflation-based factor is not a priced risk factor (I construct the factor following the two-step procedure in Fama and MacBeth 1973). These findings suggest that the abnormal returns I document are not attributable to an omitted inflation-based risk factor. Instead, these findings are consistent with abnormal returns stemming from inflation information that is costly to obtain and process and, hence, are consistent with market efficiency under costly information. Second, examining future abnormal returns to portfolios sorted on the basis of companies' cash holdings resulted in a significantly positive future abnormal return for a zero-cost portfolio that longs the high-cash companies and shorts low-cash companies. Further analysis of future abnormal returns to each of the cash holdings portfolios revealed that the positive future abnormal return stems only from the highest cash holding companies.

In this study, I use financial statement analysis to examine systematic stock-valuation implications of inflation effects on individual companies. I show that real-time inflation-based investment strategies result in significant risk-adjusted hedge returns stemming from investors' failure to fully impound information on cross-sectional differences in the way inflation affects companies. I also develop new inflation-adjustment procedures and find that most of the inflation-based abnormal hedge returns stem from companies' nonmonetary holdings rather than their net monetary holdings of assets and liabilities. The strategies can benefit investors by generating significant abnormal returns because the strategies are ex ante and thus conditioned on information available to investors in real time as of the initial investment and rebalancing dates. Overall, this study makes four significant contributions to capital market research, as detailed in the introduction.

Because this study concerns research on the use of accounting data by stock market investors, one direction for future research would be to examine how investor sophistication in financial statement analysis affects stock valuation with respect to inflation information. For example, prior research identifies cases of underreaction to information on the part of sell-side analysts (e.g., overoptimism: De Bondt and Thaler 1990; underestimation of serial correlation in quarterly earnings: Mendenhall 1991; underreaction to past stock returns: Abarbanell 1991; Konchitchki et al. 2013; bias: Michaely and Womack 1999; underreaction to predictable earnings: Bradshaw, Richardson, and Sloan 2001).[14] Using investor sophistication proxies—for example, coverage by sell-side analysts, percentage of institutional investors, and degree of experienced and/or active investors—future research can answer open questions regarding how the documented significant stock returns are related to the sophistication of companies' investors. Another direction for future research would be to examine the consequences of the inflation effect on specific accounting items (e.g., revenues, expenses, and investment in real estate).

[14] For additional examples and reviews of related literature, see Kothari (2001), Bradshaw (2011), and Bradshaw et al. (2012).

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Table 1. Annual Analysis

	Summary of Annual Returns			
	Mean	Standard Deviation	No. Positive	% Positive
FF hedge return	0.1115	0.1005	26	93%
t-Statistic	5.868			
FFC hedge return	0.1097	0.0989	26	93%
t-Statistic	5.868			
FFC-*RNOA* hedge return	0.1236	0.1274	26	93%
t-Statistic	5.134			

Annual Results

	Portfolio Construction Year									
	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
FF hedge return	0.107	0.098	0.118	0.052	0.074	0.075	0.113	0.091	0.116	0.145
FFC hedge return	0.096	0.096	0.114	0.058	0.068	0.082	0.122	0.099	0.104	0.145
FFC-*RNOA* hedge return	0.062	0.110	0.122	0.064	0.067	0.079	0.120	0.083	0.115	0.151

	Portfolio Construction Year									
	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
FF hedge return	0.193	0.058	0.034	0.124	0.385	0.236	0.222	0.068	0.213	–0.078
FFC hedge return	0.180	0.048	0.024	0.110	0.396	0.240	0.222	0.078	0.208	–0.066
FFC-*RNOA* hedge return	0.236	0.030	0.044	0.108	0.408	0.238	0.258	0.130	0.211	–0.054

	Portfolio Construction Year							
	2004	2005	2006	2007	2008	2009	2010	2011
FF hedge return	0.053	0.030	–0.031	0.021	0.350	0.111	0.059	0.089
FFC hedge return	0.052	0.026	–0.025	0.023	0.326	0.124	0.054	0.068
FFC-*RNOA* hedge return	0.048	0.026	–0.004	0.029	0.562	0.119	0.045	0.054

Notes: The table presents results from estimating annual company abnormal returns for the year following portfolio construction, summarized across all companies in each year as well as across all companies and years. The hedge returns are annual returns from zero-investment inflation-based strategies, where returns are adjusted for the Fama–French (FF), Fama–French–Carhart (FFC), and Fama–French–Carhart–Hirshleifer (FFC-*RNOA*) factors. For each year, I sort observations with the lowest (highest) *InfEffect* into Portfolio 1 (10), where *InfEffect* is the periodic inflation effect on the company. Next, for each portfolio-year, I accumulate mean abnormal returns over the subsequent year beginning three months after the fiscal year-end. The adjusted returns are $R_{i,t}$, the annually compounded raw return of the company, minus the product of company-specific betas and the respective factors, where company-specific betas are obtained by regressing the company's time-series monthly excess return on the related factors. The Fama–French factors refer to *MKTRF*, *SMB*, and *HML* from Fama and French (1993). The Carhart factor refers to the momentum factor from Carhart (1997). The *RNOA* factor refers to returns to a factor-mimicking *NOA* portfolio, where *NOA* is net operating assets deflated by lagged total assets and is constructed as described in Hirshleifer et al. (2004). *RNOA* is formed by first sorting all observations for each month *m* into two *NOA* groups and three *BTM* groups and constructing six portfolios from the intersections of the two *NOA* and three *BTM* groups. I then calculate monthly value-weighted returns on the six portfolios over the subsequent year, beginning three months after the fiscal year-end. *RNOA* is calculated for each month as the average of the monthly returns on the three high-*NOA* portfolios minus the average of the monthly returns on the three low-*NOA* portfolios. Raw stock returns are from the CRSP Monthly Stock File, adjusted for delisting returns. The risk-free rate, the Fama–French factors, and the momentum factor are from the Fama–French Portfolios and Factors dataset available from WRDS. Accounting data are from Compustat North America Fundamentals Annual. The sample consists of US stocks in the intersection of CRSP and Compustat with data available to calculate inflation effects, with fiscal year-ends between 1984 and 2012, and with future stock returns available as of March 2013. Because the analyses required future returns, the portfolio construction years are 1984–2011 (n = 28).

Table 2. Inflation-Based Portfolio Regressions of Monthly Future Returns

	Alpha	*MKTRF*	*SMB*	*HML*	Adjusted R^2
Portfolio 1 (lowest)					
Coefficient	0.0058	1.0791	0.8660	0.3500	87%
t-Statistic	4.582	37.118	20.606	7.825	
Portfolio 2					
Coefficient	0.0047	0.9921	0.8471	0.2415	91%
t-Statistic	5.076	46.521	27.478	7.362	
Portfolio 3					
Coefficient	0.0042	0.9770	0.7610	0.2346	91%
t-Statistic	4.646	47.826	25.768	7.466	
Portfolio 4					
Coefficient	0.0046	0.9927	0.7755	0.1341	93%
t-Statistic	5.294	50.345	27.209	4.421	
Portfolio 5					
Coefficient	0.0026	1.0108	0.7310	0.1431	92%
t-Statistic	2.917	49.157	24.593	4.524	
Portfolio 6					
Coefficient	0.0008	0.9896	0.6589	0.2105	91%
t-Statistic	0.816	47.782	22.007	6.608	
Portfolio 7					
Coefficient	–0.0002	0.9675	0.5552	0.2800	87%
t-Statistic	–0.217	41.153	16.337	7.744	
Portfolio 8					
Coefficient	0.0001	0.9703	0.5629	0.2392	89%
t-Statistic	0.131	44.541	17.876	7.139	
Portfolio 9					
Coefficient	–0.0012	1.0441	0.6432	0.2029	89%
t-Statistic	–1.130	44.469	18.949	5.618	
Portfolio 10 (highest)					
Coefficient	–0.0033	1.0921	0.7823	0.2044	90%
t-Statistic	–2.967	43.184	21.401	5.254	
Summary of monthly portfolio returns					
FF hedge return	0.0091				
t-Statistic	9.120				
FFC hedge return	0.0095				
t-Statistic	9.410				
FFC-*RNOA* hedge return	0.0091				
t-Statistic	9.150				

Notes: The table presents results from estimating time-series monthly portfolio regressions, controlling for risk by sequentially adding risk factors in addition to the three Fama–French factors. The three hedge returns are annual returns from zero-investment inflation-based strategies, where returns are adjusted for the FF, FFC, and FFC-*RNOA* factors. First, each company-year observation accumulated returns over the 12 months beginning 3 months after the fiscal year-end. Second, I construct 10 portfolios such that for each period all company-year observations with the lowest (highest) *InfEffect* are sorted into Portfolio 1 (10), rebalanced monthly. Third, I calculate average portfolio excess returns, $R_{p,m} - R_{f,m}$, for each month *m* using all observations for the respective portfolio and estimate time-series monthly portfolio regressions by regressing the monthly portfolio excess returns on the Fama–French factors, sequentially adding momentum and *NOA*-based factors as controls. The intercepts from these regressions, reported in the Portfolio Alpha column, are of interest for evaluating investment returns. To test for abnormal hedge returns from using this inflation-based trading strategy, I conduct statistical tests on the difference between the highest and lowest portfolios by regressing zero-cost-investment hedge portfolio returns, obtained from longing the lowest portfolio and shorting the highest portfolio, on the related-period factors. The intercept from this zero-cost hedge regression is the monthly abnormal return on a zero-inflation-based hedge strategy that buys the lowest portfolio and sells short the highest portfolio. *RNOA* is formed as described in Table 1. The risk-free rate, $R_{f,m}$, is the one-month US Treasury bill rate. Monthly raw stock returns are from CRSP Monthly Stock File and are adjusted for delisting returns. The risk-free rate, the Fama–French factors, and the momentum factor are from the Fama–French Portfolios and Factors dataset available from WRDS. Accounting data are from Compustat North America Fundamentals Annual. The sample consists of US stocks in the intersection of CRSP and Compustat with data available to calculate inflation effects, with fiscal year-ends between 1984 and 2012, and with future stock returns available as of March 2013. Because the analyses required future returns, the portfolio construction years are 1984–2011 ($n = 28$).

Table 3. Inflation-Based Returns to Monetary and Nonmonetary Holdings

	Summary of Annual Returns				Summary of Monthly Portfolio Returns	
	Mean	Standard Deviation	No. Positive	% Positive		
A. Strategies based on inflation effects on companies' net monetary holdings (InfEffect_NetMonetary)						
FF hedge return	0.0124	0.1710	11	39%	FF hedge return	0.0020
t-Statistic	0.384				*t*-Statistic	1.380
FFC hedge return	0.0168	0.1681	11	39%	FFC hedge return	0.0023
t-Statistic	0.528				*t*-Statistic	1.560
FFC-*RNOA* hedge return	0.0224	0.1692	13	46%	FFC-*RNOA* hedge return	0.0014
t-Statistic	0.700				*t*-Statistic	1.000
B. Strategies based on inflation effects on companies' nonmonetary holdings (InfEffect_NonMonetary)						
FF hedge return	0.1196	0.0906	27	96%	FF hedge return	0.0090
t-Statistic	6.985				*t*-Statistic	9.140
FFC hedge return	0.1176	0.0898	27	96%	FFC hedge return	0.0092
t-Statistic	6.929				*t*-Statistic	9.230
FFC-*RNOA* hedge return	0.1349	0.1261	28	100%	FFC-*RNOA* hedge return	0.0090
t-Statistic	5.661				*t*-Statistic	9.030

Notes: The table presents results from analyses using different inflation-based adjustment procedures that extract inflation effects based on companies' net monetary (Panel A) or nonmonetary (Panel B) holdings of assets and liabilities. The first part (from left to right) of each panel provides results from estimating annual company abnormal returns for the year following portfolio construction as in Table 1, where returns are summarized as the mean across all company-years. The second part of each panel provides results from estimating time-series monthly portfolio regressions as in Table 2. The hedge returns are annual returns from zero-investment inflation-based strategies, where returns are adjusted for the FF, FFC, and FFC-*RNOA* factors. To estimate the monetary (nonmonetary) component of *InfEffect*, I use the product of the annual inflation rate and the net monetary position (the difference of *InfEffect* minus the monetary component). Raw stock returns are from the CRSP Monthly Stock File, adjusted for delisting returns. *RNOA* refers to returns to a *NOA*-based factor formed as described in Table 1. The risk-free rate, the Fama–French factors, and the momentum factor are from the Fama–French Portfolios and Factors dataset available from WRDS. Accounting data are from Compustat North America Fundamentals Annual. The sample consists of US stocks in the intersection of CRSP and Compustat with data available to calculate inflation effects, with fiscal year-ends between 1984 and 2012, and with future stock returns available as of March 2013. Because the analyses required future returns, the portfolio construction years are 1984–2011 (n = 28).

Table 4. Trend Analysis of Future Annual Returns with Current-Period Inflation Information and Fixed *NOA*

Inflation-Based Portfolio	Market-Adjusted Return	FF-Adjusted Return	FFC-Adjusted Return	FFC-*RNOA*-Adjusted Return
NOA Portfolio 1				
1	0.11	0.10	0.13	0.16
2	0.14	0.13	0.15	0.18
3	0.05	0.04	0.06	0.07
4	0.01	0.01	0.02	0.04
5	0.03	0.02	0.03	0.04
Trend	–0.0282	–0.0289	–0.0325	–0.0386
t-Statistic	–2.6037	–2.9080	–3.1231	–3.6505
Adjusted R^2	59%	65%	69%	75%
NOA Portfolio 2				
1	0.11	0.08	0.09	0.11
2	0.07	0.06	0.08	0.10
3	0.04	0.01	0.03	0.05
4	–0.01	–0.01	0.00	0.01
5	0.01	–0.01	0.01	0.02
Trend	–0.0278	–0.0238	–0.0245	–0.0270
t-Statistic	–4.1174	–4.7116	–4.4536	–5.2507
Adjusted R^2	80%	84%	82%	87%
NOA Portfolio 3				
1	0.08	0.06	0.07	0.09
2	0.06	0.05	0.06	0.07
3	0.05	0.03	0.05	0.06
4	0.03	0.01	0.03	0.04
5	0.04	0.01	0.03	0.04
Trend	–0.0115	–0.0128	–0.0115	–0.0132
t-Statistic	–3.2152	–6.2024	–5.2709	–8.9747
Adjusted R^2	70%	90%	87%	95%
NOA Portfolio 4				
1	0.07	0.06	0.07	0.08
2	0.03	0.02	0.03	0.04
3	0.02	0.01	0.02	0.03
4	0.01	–0.01	0.00	0.01
5	0.01	0.00	0.01	0.02
Trend	–0.0154	–0.0151	–0.0148	–0.0140
t-Statistic	–4.3840	–3.4526	–3.4318	–3.1111
Adjusted R^2	82%	73%	73%	68%
NOA Portfolio 5				
1	0.00	0.00	0.02	0.02
2	0.01	0.00	0.01	0.01
3	–0.01	–0.02	0.00	0.00
4	–0.03	–0.05	–0.02	–0.02
5	–0.05	–0.06	–0.004	–0.03
Trend	–0.0144	–0.0163	–0.0147	–0.0134
t-Statistic	–5.0826	–8.1448	–10.3345	–8.9307
Adjusted R^2	86%	94%	96%	95%

Notes: The table presents mean company-level returns, calculated over the year subsequent to inflation-based portfolio formation, for portfolios based on the intersection of five *NOA* and five inflation-based (i.e., *InfEffect*) portfolios. For each year, I sort all observations into five *NOA* and five *InfEffect* portfolios such that the lowest (highest) values were sorted into Portfolio 1 (5). Next, for each of the five-by-five portfolios, I accumulate mean abnormal returns over the subsequent year beginning three months after the fiscal year-end. The trend across

InfEffect portfolios and the associated *t*-statistic and adjusted R^2 are the slope coefficient, its related *t*-statistic, and the adjusted R^2 from a trend regression of the specific metric's abnormal return on the *InfEffect* portfolio number (and an intercept that is omitted). Market-adjusted return is the annually compounded raw return of the company, $R_{i,t}$, minus the annually compounded value-weighted return on all NYSE, Amex, and NASDAQ stocks in CRSP. Adjusted return is $R_{i,t}$ minus the product of company-specific betas and the respective factors, where company-specific betas are obtained by regressing the company's time-series monthly excess return on the factors. *RNOA* refers to returns to a factor-mimicking *NOA* portfolio, formed as described in Table 1. Raw stock returns are from the CRSP Monthly Stock File, adjusted for delisting returns. The risk-free rate, the Fama–French factors, and the momentum factor are from the Fama–French Portfolios and Factors dataset available from WRDS. Accounting data are from Compustat North America Fundamentals Annual. The sample includes US stocks in the intersection of CRSP and Compustat with data available to calculate inflation effects, with fiscal year-ends between 1984 and 2012, and with future stock returns available as of March 2013. Because the analyses required future returns, the portfolio construction years are 1984–2011 (n = 28).