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An Extended Inflation Adjustment Algorithm. Online Supplementary Material

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ABSTRACT: I provide an inflation adjustment algorithm that extends the algorithm in Konchitchki (2011, "Inflation and Nominal Financial Reporting: Implications for Performance and Stock Prices," *The Accounting Review*). It provides detailed information about developing and validating an algorithm for incorporating inflationary effects into accounting amounts, using only publicly available information, by adjusting nominal to inflation-adjusted amounts on a firm-by-firm basis for a broad sample of firms.

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Inflation Adjustment Algorithm

Financial statements can be restated using the balance sheet or the income statement.[1] I rely on the balance sheet to adjust the nominal financial statements.[2]

A Simple Example. I first demonstrate how nominal amounts can be different from inflation-adjusted amounts. This example intentionally excludes drivers that affect inflation-adjusted amounts (e.g., the example assumes the purchasing date of the nonmonetary asset is known, and it does not include estimation of, for example, transaction dates, the sale and purchase of nonmonetary assets throughout the period, investments, debt repayments, and changes to the rate of inflation). Consider two firms, the "Cash Firm" and the "Land Firm", both established at time 0 with an investment of $70 and a loan of $30. The firms hold one asset, cash or land, respectively, at the beginning of the period. Each firm participates in one activity that generates $20 cash per year, and the cash generated is accumulated in the firm. Also assume two periods, constant annual inflation rate of four percent, and that cash is obtained at the end of the period.

Appendix Table, Panel A, provides the nominal balance sheets for this example, which, by their nature, are linked to different points in time and therefore are a mix of items from periods with different purchasing power. To construct inflation-adjusted balance sheets on a constant dollar basis, I control for the effects of inflation as follows. First, controlling for inflation, the land bought at Year 0 for $100 is equivalent to $104 [100*(1+4%)] stated in the

[1] Using the balance sheet, balance sheet components are first separated into monetary and nonmonetary items, and then inflation-adjusted earnings are derived by applying the clean surplus relation and other accounting identities. Using the income statement, transactions occurring during the year (e.g., sales) are adjusted for inflation from the transaction date, and components relating to nonmonetary balance sheet items (e.g., changes in inventories, depreciation) are adjusted on the same basis as the related balance sheet item. The clean surplus relation makes the two approaches equivalent. This is because the income statement approach derives inflation-adjusted income before financing expenses by adjusting income statement amounts, whereas the balance sheet approach first calculates inflation-adjusted earnings using two successive balance sheets and then calculates inflation-adjusted financing expenses as the difference between net earnings and income before financing expenses. Inflation-adjusted financing expenses are the same if derived using the balance sheet or the income statement, resulting in same inflation-adjusted earnings under the two approaches.

[2] This is because (1) it avoids mistakes inherent in deriving *IAEarnings* directly from the income statement, (2) it is more accurate because having all transaction dates and income statement amounts are not necessary, and (3) because I focus on inflation-adjusted earnings, rather than inflation-adjusted revenues or gross profit, I can bypass reliance on further assumptions necessary to adjust the income statements (e.g., the timing of revenues over the year).

purchasing power of Year 1. Second, because at each year-end t the balance sheets are adjusted to the purchasing power as of year-end t, the \$100 of both land and cash in t–1 equal \$104 on a constant dollar basis. Third, for each year-end t, the land (nonmonetary item) is adjusted for inflation from the original transaction date until year-end t, whereas any \$X in cash at t year-end is monetary and therefore reflects purchasing power of \$X. Finally, the difference between equity in two successive balance sheets represents the earnings for the period (assuming that there are no stock issues, dividends, or other activities that affect equity), and thus for each year-end t, two successive balance sheets stated in terms of t year-end are needed.

Appendix Table, Panel B, provides balance sheets stated in constant dollars as of the end of each period, including two successive sets for each period. The panel shows that the financial statements are different when adjusted for inflation. First, for the Cash Firm, because the firm has only monetary items, the inflation-adjusted amounts for each year-end t (not the comparable numbers of the previous year) are the same as the nominal amounts presented in Panel A. Second, the comparable numbers from t–1, stated in constant dollars as of year-end t, are different under nominal and inflation-adjusted bases. Third, for the Land Firm, the inflation-adjusted amounts are the nominal amounts adjusted for inflation from the purchasing date.

Appendix Table, Panel C, shows that whereas for both the Cash Firm and the Land Firm the nominal earnings are \$20 in each of the two periods, the inflation-adjusted earnings differ between firms and across periods: *IAEarnings* for the Cash Firm for year 1 and year 2 are \$17.2 and \$16.4, respectively, compared with respective *IAEarnings* for the Land Firm of \$21.2 and \$20.4. A number of drivers lead to differences between nominal and inflation-adjusted amounts. For example, the Cash Firm in period 1 incurs a loss of \$4 because its beginning-of-period \$100 cash amount represents lower purchasing power at the end of the period. Also, although the land is recognized at its historical cost of \$100 under the nominal measure, the inflation-adjusted measure takes into consideration that in subsequent periods the original amount of \$100 should increase to represent the original amount spent in terms of consumption units. The net effect on

IAEarnings is a function of the inflation rate over time and a firm's relative weights in land, cash, and liabilities over its life.

I extend the example above to explain how the algorithm adjusts for inflation nominal financial statements of a broad sample of actual firms.

A. Step 1: Adjustment of Nonmonetary Items

Nonmonetary items are linked to the dollar as of the year-end, but represent either a historical cost or a right (obligation) to receive (deliver) services for which purchasing power is not constant. I adjust these items as follows:

A.1. PPE: I use the PPE life cycle to adjust PPE. An asset's useful life is the period over which the entity expects to consume economic benefits from the asset. Assuming that accounting depreciation, on average, reflects an asset's useful life, the PPE life cycle is the average number of years from the asset's purchase until it is fully depreciated. I thus calculate the PPE life cycle as: $PPELifeCycle_t = (1/n)\cdot\sum_{i=t-n+1}[GrossPPE/PPE\ Depreciation]_i$, averaged over the four years prior to year-end t ($n = 4$).[3] Next, I adjust Net PPE as follows: $adjNetPPE_t = NetPPE_t\cdot CPI_t/CPI_{t-\tau(t)}$, where *adj* refers to "adjusted"; t refers to the year t fiscal year-end; $\tau(t)$ is the period prior to fiscal year-end t, stated in annual terms and calculated as $\tau(t) = 0.5\cdot PPELifeCycle_t$; and *CPI* denotes the Consumer Price Index.[4] If *PPELifeCycle* is negative, missing, or greater than the Compustat median limit of weighted expected useful life among different asset classes, which is calculated based on the expected maximum useful life of different PPE classes (e.g., Unites States Regulations. 2003. Property, plant, and equipment departmental regulation. Office of the

[3] On the one hand, higher n reduces estimation error because it averages life cycles over a longer period. On the other hand, higher n requires more lagged data (e.g., see White et al. 2002).

[4] I multiply *PPELifeCycle* by one-half because the life cycle is derived from gross, rather than net, PPE so the expected remaining useful life is one-half the gross PPE life cycle. Information about the exact transaction dates and amounts over the life of the firm is unavailable. Such information could help in estimating the exact purchasing date of each component of PPE and adjust it based on the associated vintage's purchasing power. Instead, I make a simplifying assumption that the PPE in place is acquired evenly over its life with the firm. That is, I adjust PPE using one-half of the Gross PPE life cycle such that the expected value of the remaining useful life is one-half of the life cycle obtained from Gross PPE. Also, note that because the adjustment is accurate to the monthly level, whereas t refers to annual amounts, τ is often a fraction (e.g., for an estimated purchase date of six months prior to fiscal year-end t, $\tau = 0.5$ and $NetPPE_t$ is adjusted using $CPI_t/CPI_{t-0.5}$).

Chief Financial Officer, Washington, D.C.) varying between 20 years (e.g., Machinery and Equipment) and 50 years (e.g., Other Structures and Facilities), I set it to the median life cycle calculated using the Compustat population over the sample period.[5,6]

A.2. Inventory: I use the inventory turnover ratio, *IT*, to adjust inventory. This ratio equals *Sales*/*Inventory* or *COGS*/*Inventory*, where *COGS* is the Cost of Goods Sold. I use the latter ratio because sales are recognized at market value whereas inventory is usually recognized at cost. Also, to minimize reliance on shocks to inventory in a particular year, instead of using year-end inventory I use the average inventory calculated over two successive periods. Year-end t inventory turnover is calculated as: $IT_t = COGS_t/[(INV_t+INV_{t-1})/2]$. If $IT_t = 2$, for example, the firm invests in inventory twice a year so the average inventory is six months old. In expectation, year-end inventory will have remaining life of $12/(2\cdot IT_t)$ when stated in months, or $\kappa(t) = 1/(2\cdot IT_t)$ when stated in years. Thus, I adjust inventory as follows: $adjINV_t = INV_t\cdot CPI_t/CPI_{t-\kappa(t)}$. If *COGS* or *INV* are missing or negative, *IT* is set to the median *IT* of the Compustat population over the sample period.[7]

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[5] The adjustment assumes that firms use the straight-line depreciation method. The reason is that information regarding depreciation method is available from footnotes for 62 percent of all firm-year observations during my sample period and the straight-line depreciation method is used in 95 percent of these observations. This is consistent with prior literature that suggests most firms use straight-line depreciation for financial reporting purposes (Bartov 1993; Horngren et al. 2002). Also, two refinements of the algorithm are as follows: (1) because firms operating in the same industries are likely to use similar assets, the useful life of PPE is based on the main class of assets of the industry in which the firm is operating; and (2) because different classes of assets have different lives, the assets can be separated into different depreciation classes to calculate different life cycles of these classes (e.g., machinery & equipment, natural resources, land & improvements, leases).

[6] Note that there can be alternative adjustment procedures depending on the assumptions used and the objectives underlying the adjustment. My objectives are to: (1) ensure consistency with actual inflationary GAAP; (2) obtain a sample of firms for which Compustat does not necessarily have available adjustment parameters (e.g., inventory and deprecation methods); and (3) develop a procedure that can be validated on firms in another country. Thus, I rely on simplifying assumptions that allow me to extract inflation-adjusted data from a broad sample of U.S. firms and validate the procedure in a country without detailed adjustment parameters. Requiring data about the inventory and depreciation methods would reduce my sample considerably, because U.S. data on inventory and depreciation method are unavailable for about 40 percent of the observations, whereas an alternative procedure could require data on the depreciation method (e.g., see Davidson et al. 1976).

[7] The assumption underlying the use of inventory turnover is that FIFO is the inventory method. If the inventory valuation method of all inventory layers is instead based on LIFO, the adjustment can be based on (1) determining whether there is a change in the inventory amount over the year, (2) developing LIFO layers, or (3) regressing inventory over time (Petersen 1973). Information on the inventory method is available from footnotes for 60 percent of all firm-year observations during my sample period and, for those entities for which information is available, three percent use pure LIFO. Because for each layer of inventory, information about impairments based on the lower cost/value rule for inventories is unavailable, the adjustment assumes that the year-end inventory amount has not

A.3. Intangibles: I calculate the intangibles' remaining life for time *t*, denoted as $\omega(t)$, as the ratio of intangibles to the amortization of the related intangibles at time *t*. I assume that, in expectation, the number of years prior to the transaction generating the intangibles equals the remaining years until the amount of intangibles is fully reserved, and thus I adjust intangibles using the price index as of the expected value of the original transaction date, or $adjIntangibles_t = Intangibles_t \cdot CPI_t / CPI_{t-\omega(t)}$. I set intangibles' remaining life to the median remaining life of intangibles for the Compustat population over the sample period if it is negative, missing, or greater than firms' common weighted useful life of different intangibles classes, which is calculated based on the useful life of different intangibles classes varying between two and 40 years (e.g., patents) and between 20 and 40 years (e.g., goodwill). Also, according to SFAS 142 (effective in 2002), goodwill and other intangible assets no longer have a defined life for amortization but instead are tested annually for impairment. Because the algorithm uses amortization based on the pre-SFAS 141/142 period, it uses parameters obtained from the Compustat population to adjust the years that follow. I repeat all analyses without amortizing the years subsequent to 2002, and the inferences are unchanged.

A.4. Common Stock, Preferred Stock, and Capital Surplus: These items, which are included in shareholders' equity and represent purchasing power as of the stock issue dates, consist of two layers: (1) all stock issues from a firm's establishment through *t*–1, and (2) new equity issues occurring in year *t* (this layer can include several sub-layers, one from every equity issue that occurred over the year). I assume that equity issues are distributed uniformly over the year. To state amounts in constant dollars as of the reporting date, I begin by adjusting the first layer to derive retained earnings for both year *t*–1 and year *t*. In constant dollars as of *t* year-end, the adjusted amount of the first layer in *t*–1 is equal to the amount in *t* for calculating year *t* adjusted earnings. Using this two-layer process allows one to adjust earnings without having

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been impaired under the lower cost/value rule. I conduct further refinements to check the robustness of this assumption on the results (e.g., I restrict inventory life cycle to inventory layers with different life cycles), and the main results are unchanged.

information about all the preferred and common stock issue dates and amounts from firms' incorporation dates until t–1. Thus, the following amount, which corresponds to the first layer and provides t–1 equity, appears in any two consecutive retained earnings and is used to extract inflation-adjusted earnings: $adjE_{t-1} = [CommonStock + PreferredStock + CapitalSurplus]_{t-1} \cdot CPI_t / CPI_{t-1}$. For the second layer, I obtain adjusted new issues during the year, $adjNewIssues_t$, by calculating new issues, $NewIssues_t = [CommonStock + PreferredStock + CapitalSurplus]_t - [CommonStock + PreferredStock + CapitalSurplus]_{t-1}$, and adjusting this amount using one-half year's change in *CPI*, under the assumption that new issues occur uniformly throughout the year.

A.5. Other Monetary Items in Stockholders' Equity but not in Retained Earnings (*O*): Because earnings are obtained from the difference in retained earnings between two successive periods (adjusted for dividends and capital changes), it is necessary to exclude items that violate the clean surplus relation (e.g., Employee Benefit Trust) from inflation-adjusted retained earnings. This component is assumed to be monetary and is calculated as $O_t = TotalAssets_t - TotalLiabilities_t - ReExOCI_t - CommonStock_t - PreferredStock_t - CapitalSurplus_t$, where $RetExOCI_t$ is per A.6 below.

A.6. Retained Earnings Excluding Other Comprehensive Income (*ReExOCI*): It is critical to maintain the clean surplus relation when deriving earnings. Accordingly, I obtain nominal and inflation-adjusted Retained Earnings Excluding Other Comprehensive Income. The inflation-adjusted amount is required because *IAEarnings* is derived using the two-period difference in inflation-adjusted *ReExOCI*. The nominal amount is used to derive *O* (per A.5.) as follows: *ReExOCI* = Retained Earnings (Compustat: RE) – Accumulated Other Comprehensive Income (Compustat: ACOMINC). The inflation-adjusted *ReExOCI* as of year t, $adjReExOCI_t$, is derived by using the relation that total assets equal total liabilities plus shareholders' equity, and by stating all balance sheets amounts in constant dollars, where monetary (nonmonetary) items are not (are) adjusted: $adjReExOCI_t = adjINV_t + adjNetPPE_t + adjIntangibles_t + OA_t - adjE_{t-1} - adjNewIssues_t - O_t - TotalLiabilities_t$. (Where, as above, $adjE_{t-1} = [CommonStock + PreferredStock + CapitalSurplus]_{t-1} \cdot CPI_t / CPI_{t-1}$.) Total liabilities are treated as monetary. I treat as monetary other assets (*OA*) that are not directly adjusted, and derive them as a residual value, using the relation that total assets equal total liabilities plus shareholders' equity, as follows: $OA_t = TotalAssets_t - INV_t - NetPPE_t - Intangibles_t$.

A.7. Other Comprehensive Income and Other Items Affecting Retained Earnings without Directly Affecting Net Income (*OtherInReExOCI*): This item is used in the equation that derives *IAEarnings*. Two types of exclusions are subtle, yet necessary for the accounting identities to hold and thus for the accuracy of the algorithm. First, because *IAEarnings* is obtained using the two-period difference in *adjReExOCI*, dividends must be included in the adjustment. Second, all transactions that are neither part of Other Comprehensive Income nor part of Net Income need to be excluded (e.g., Net Issues of Common Stock under Employee Plans; Purchases and Sales of Treasury Stocks under Employee Plans). Because these exclusions are the result of transactions occurring at the year-end, I treat them as monetary. These amounts are calculated as: $OtherInReExOCI_t = ReExOCI_t - ReExOCI_{t-1} - NetIncome_t + CommonDividends_t + PreferredDividends_t$.

A.8. Dividends: Because dividends are usually paid quarterly, the adjusted common and preferred dividends, *adjCommonDividends* and *adjPreferredDividends*, are adjusted assuming these payments are distributed uniformly over the year.

B. Step 2: Treatment of Monetary Items

Monetary assets and liabilities are measured on the basis of a fixed number of dollars required for their settlement. Thus, nominal monetary amounts are already stated in terms of constant purchasing power and, accordingly, I treat monetary items as equal to their recognized nominal amounts. The following are considered monetary: Cash, Short-Term Investments, Total Receivables, Total Liabilities, and assets not directly treated as nonmonetary assets (*OA*). The inclusion of *OA* implicitly treats unconsolidated but wholly-owned subsidiaries as monetary, consistent with Bernard and Hayn (1986).

C. Final Step: Derivation of Inflation-Adjusted Earnings

Inflation-adjusted earnings, *IAEarnings*, are calculated as follows:

$$IAEarnings_t = [adjReExOCI_t - adjReExOCI_{t-1}] + adjCommonDividends_t + adjPreferredDividends_t - OtherInReExOCI_t - adjExtraordinaryItems_t.$$

I obtain $adjReExOCI_{t-1}$ analogously to $adjReExOCI_t$ (see A.6. above), except that in this case (1) I adjust the accounting amounts reported for year t–1 to the purchasing power as of t year-end, and (2) I do not subtract $adjNewIssues_{t-1}$ because it is already part of $adjE_{t-1}$ as the new issues during t–1 are part of the t–1 equity amount.[8,9] To reduce measurement error from the adjustment procedure, I delete observations each year in the top and bottom percentiles of the MVE_{t-1}-deflated difference between *IAEarnings* and *NominalEarnings*. Because I investigate the behavior of *IAEarnings* versus *NominalEarnings* and because *NominalEarnings* refers to Net Income Excluding Extraordinary Items, I exclude extraordinary items when deriving *IAEarnings* to make the two earnings measures comparable. I assume that extraordinary items, if any occur, are distributed uniformly over the year and thus are adjusted using one-half year's change in the price index; these items are denoted as $adjExtraordinaryItems_t$. I then examine the valuation of stocks for portfolios based on the bottom-line accounting performance from the nominal reporting regime (*NominalEarnings*) versus from a regime that considers inflation effects (*IAEarnings*).[10,11] This examination allows understanding how a macroeconomic construct of

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[8] Specifically, $adjReExOCI_{t-1} = adjINV_{t-1} + adjNetPPE_{t-1} + adjIntangibles_{t-1} + adjOA_{t-1} - adjE_{t-1} - adjO_{t-1} - adjTotalLiabilities_{t-1}$, where: $adjINV_{t-1} = INV_{t-1} \cdot CPI_t / CPI_{t-1-\kappa(t-1)}$; $adjNetPPE_{t-1} = NetPPE_{t-1} \cdot CPI_t / CPI_{t-1-\tau(t-1)}$; $adjIntangibles_{t-1} = Intangibles_{t-1} \cdot CPI_t / CPI_{t-1-\omega(t-1)}$; $adjOA_{t-1} = OA_{t-1} \cdot CPI_t / CPI_{t-1}$; $adjO_{t-1} = O_{t-1} \cdot CPI_t / CPI_{t-1}$; as above, $adjE_{t-1} = [CommonStock + PreferredStock + CapitalSurplus]_{t-1} \cdot CPI_t / CPI_{t-1}$; $adjTotalLiabilities_{t-1} = TotalLiabilities_{t-1} \cdot CPI_t / CPI_{t-1}$; and $\kappa(t-1)$, $\tau(t-1)$, and $\omega(t-1)$ refer to the period (stated in years) from which the lagged nonmonetary assets *INV*, *NetPPE*, and *Intangibles*, respectively, are adjusted.

[9] It is worth noting two points with respect to the relation of the adjustment procedure to U.S. inflationary GAAP, which is no longer effective and has included six inflation-adjusted earnings measures. First, because the algorithm preserves the historical cost measurement attribute, three current cost measures are not related to the inflation-adjusted earnings measure used in this study, *IAEarnings*. Second, because the algorithm is consistent with inflationary GAAP, *IAEarnings* includes income from continuing operations plus the total effects of inflation on monetary and nonmonetary items on a constant dollar basis.

[10] For more detailed information on this asset pricing procedure, see Konchitchki (2011), Konchitchki and O'Leary (2011), Barth et al. (2013), and DeFond et al. (2013).

[11] With respect to the derivation of *IGL*, there is a normalization based on a reference point underlying the adjustment procedure. Specifically, accounting amounts can be adjusted to be stated based on either constant dollars to maintain transactions in purchasing power, or current dollars to maintain transactions in consumption units. In the

inflation interacts with the financial reporting system that produces accounting amounts for U.S. corporations.[12]

External Validation of the Algorithm

To provide evidence on the external validity of the algorithm, I test the algorithm on a sample of Israeli firms. Until 2003 Israeli firms were required to recognize financial statements in inflation-adjusted terms and disclose in footnotes the same financial statements in nominal terms, and similar to the U.S., the inflation rate in Israel over the past decade was relatively low. In the validation analysis, I examine the extent to which nominal earnings derived by the algorithm, $NominalEarnings^{Model}$, approximates disclosed nominal earnings, $NominalEarnings^{Actual}$, by estimating the equation: $NominalEarnings^{Model} = \alpha + \beta \cdot NominalEarnings^{Actual} + \varepsilon$. If the algorithm does a good job translating earnings from one measurement basis into the other, I predict the intercept to be equal to zero and the slope to be equal to one. Thus, I conduct the tests: $H_0^{\alpha}: \alpha = 0$ against $H_1^{\alpha}: \alpha \neq 0$, and $H_0^{\beta}: \beta = 1$ against $H_1^{\beta}: \beta \neq 1$. To do so, I hand collect data from Israeli firms' annual nominal and inflation-adjusted financial statements over the 1995-2003 period for 81 randomly selected firms listed on the Tel-Aviv 100 index. This index comprises the 100 firms with the highest *MVE* and accounts for more than 80 percent of the total market's capitalization. The 81 firms that I sample account for 86.63 percent of this index's total market capitalization as of December 21, 2005.

After implementing the algorithm and requiring the same restrictions as with the U.S. data, the inflation-adjusted Israeli sample includes 503 firm-year observations. Also, because footnotes are not always attached to the financial statements, causing nominal footnote

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cross-section, the variation in *IGL*, rather than its level, is informative for explaining variation across firms, and the two approaches are equivalent when intercepts are added to the tests. I choose to adjust for constant dollars, leading *IGL* to be more frequently negative. Alternatively, *IGL* can be adjusted such that it is more frequently positive but the variation across firms and over time is unchanged. Accordingly, if the prediction model is $CF_{t+1} = a + b \cdot IGL_t + X_t + \eta_{t+1}$, where X is a vector of additional explanatory variables (conditioned on the time t information set), analyses throughout the study pertain to the parameter b, which is invariant to the reference point underlying the measurement system. The intercept, a, varies with the measurement system but is not a parameter of interest in my prediction analyses. Accordingly, the research design throughout my study includes intercepts in all cross-sectional tests and focuses on the coefficient on *IGL*.

[12] For more on this growing interdisciplinary research front linking accounting information and the macroeconomy, see, e.g., Konchitchki (2013, 2015); Konchitchki and Patatoukas (2014a, 2014b, 2015); Konchitchki et al. (2016).

disclosures to not always be available, I randomly select 50 firms and gather nominal information, when such footnotes are available. Monthly CPI and exchange rate data are obtained from the Israeli Central Bureau of Statistics. The Israeli sample reflects a median firm size of $220 million. The mean and median values of the difference between actual (i.e., reported) inflation-adjusted earnings and nominal earnings, IGL^{Actual}, are –0.02 and –0.01, with a standard deviation of 0.07. This suggests a difference of about one to two percent of firms' size, with large variation between the two measures.[13]

The results reveal that the null hypotheses of $\alpha = 0$ (p = 0.609) and $\beta = 1$ (p = 0.240) cannot be rejected, with point estimates of $\alpha = 0.01$ and $\beta = 0.8$.[14] Overall, although the adjustment procedure does not use data about the timing and amounts of all of the firms' transactions over the life of the firms until the reporting date (which are needed for complete inflation adjustment), the findings reveal that the algorithm provides a reasonable and unbiased proxy for the effects of inflation.

[13] The validation analysis requires that several obstacles be overcome. First, because the requisite Israeli data are not available in organized format, I hand collect firms' annual data, as described above. Second, because Israeli GAAP requires footnote disclosure of selected nominal data, considerably more data are reported on an inflation-adjusted basis. Thus, I use an inverted algorithm that maps from inflation-adjusted to nominal amounts, and use as input the Israeli inflation-adjusted data. Third, there are cases where the same accounting item is named differently, an item is named in a different level of detail, or the translated accounting item does not have an equivalent in Compustat (e.g., "Cost of Goods and Services Sold" in the Israeli data versus "Cost of Goods Sold" in Compustat). Thus, I create a translation dictionary that classifies different terms with the same content under a specific term and matches each Israeli data item to the equivalent Compustat data item. This procedure results in Israeli firm-year observations with a format similar to that of U.S. companies in Compustat.

[14] I conduct further checks on the algorithm's accuracy. First, I form a statistic based on the mean difference between reported nominal earnings and earnings obtained from the algorithm, denoted as μ_x, and test H_0: $\mu_x = 0$ against H_1: $\mu_x \neq 0$. The results show that the null cannot be rejected (p $= 0.744$), which suggests the algorithm provides a reasonable estimate of the effects of inflation. Second, the algorithm uses computations that interact accounting items with monthly CPI values. To investigate whether these computations introduce measurement error, I derive *IAEarnings* after injecting a constant zero inflation rate into the system. This check results in *IAEarnings* being equal to *NominalEarnings*, consistent with zero inflation and zero measurement error from CPI computations. Third, I derive *NominalEarnings* using the algorithm and compare it to the Compustat amount. The results show the same earnings amount in all observations except those with missing values because of unavailable data.

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APPENDIX TABLE
Example

Panel A: Nominal Balance Sheets

	Cash Firm					Land Firm			
	Assets		Liabilities + Equity			Assets		Liabilities + Equity	
Year 0:	Cash	100.00	Liabilities	30.00	Year 0:	Cash	0.00	Liabilities	30.00
			Equity	70.00		Land	100.00	Equity	70.00
Year 1:	Cash	120.00	Liabilities	30.00	Year 1:	Cash	20.00	Liabilities	30.00
			Equity	90.00		Land	100.00	Equity	90.00
Year 2:	Cash	140.00	Liabilities	30.00	Year 2:	Cash	40.00	Liabilities	30.00
			Equity	110.00		Land	100.00	Equity	110.00
Year 3:	Cash	160.00	Liabilities	30.00	Year 3:	Cash	60.00	Liabilities	30.00
			Equity	130.00		Land	100.00	Equity	130.00

Panel B: Inflation-Adjusted Balance Sheets. Constant Dollars as of Each Period Year-End

As of Period 1 Year-End (constant dollars as of the end of Year 1)

	Cash Firm					Land Firm			
	Assets		Liabilities + Equity			Assets		Liabilities + Equity	
Year 0:	Cash	104.00	Liabilities	31.20	Year 0:	Cash	0.00	Liabilities	31.20
			Equity	72.80		Land	104.00	Equity	72.80
Year 1:	Cash	120.00	Liabilities	30.00	Year 1:	Cash	20.00	Liabilities	30.00
			Equity	90.00		Land	104.00	Equity	94.00

As of Period 2 Year-End (constant dollars as of the end of Year 2)

	Cash Firm					Land Firm			
	Assets		Liabilities + Equity			Assets		Liabilities + Equity	
Year 1:	Cash	124.80	Liabilities	31.20	Year 1:	Cash	20.80	Liabilities	31.20
			Equity	93.60		Land	108.16	Equity	97.76
Year 2:	Cash	140.00	Liabilities	30.00	Year 2:	Cash	40.00	Liabilities	30.00
			Equity	110.00		Land	108.16	Equity	118.16

Panel C: Inflation-Adjusted and Nominal Earnings for the Three Periods

	Cash Firm		Land Firm	
	Period 1	Period 2	Period 1	Period 2
Nominal Earnings (*NominalEarnings*)	20.0	20.0	20.0	20.0
Inflation-Adjusted Earnings (*IAEarnings*)	17.2	16.4	21.2	20.4
Inflation-Adjusted Minus Nominal (*IGL*)	–2.8	–3.6	1.2	0.4

The table presents inflation-adjusted and nominal financial statements for the example described in the Extended Appendix.