Understanding U.S. Corporate Tax Losses

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October 6, 2008

Abstract

Recent data on corporate tax losses presents a puzzle this paper attempts to explain: the ratio of losses to positive income was much higher around the recession of 2001 than in earlier recessions, even those of greater severity. Using a comprehensive sample of U.S. corporation tax returns for the period 1982-2005, we explore a variety of potential explanations for this surge in tax losses, taking account of the significant use of executive compensation stock options beginning in the 1990s and recent temporary tax provisions that might have had important effects on taxable income.

We find that losses rose because the average rate of return of C corporations fell, rather than because of an increase in the dispersion of returns or an increase in the gap between corporate profits subject to tax and corporate profits as measured by the national income accounts. Our analysis also suggests that the increasing importance of S corporations may help explain the recent experience within the C corporate sector, as S corporations have exhibited a different pattern of losses in recent years. However, we can identify no simple explanation for the differing experience of C and S corporations. Our investigation concludes with some new puzzles: why did rates of return of C corporations fall so much early in the decade and why has the incidence of losses among C and S corporations diverged?

I. Introduction

The U.S. tax system, like other tax systems around the world, treats positive and negative income in an asymmetric manner. While positive income is subject to immediate taxation, losses do not qualify unconditionally for refunds. Under the U.S. corporation income tax, losses receive an immediate refund only to the extent that they can be "carried back" against amounts of income at least as high in absolute value, under current law from the previous two years. Otherwise, losses must be "carried forward," and may be deducted and hence generate a tax refund only when future income is sufficient to cover the deduction. Carrying losses forward reduces the value of eventual deductions, due to deferral without interest and possible expiration.

Different potential justifications exist for this and other asymmetries in the tax code. One is the prevention of fraud, the notion being that a "real" company experiencing losses should eventually generate positive income, so that forcing a deduction of losses against income is a mechanism for weeding out fraudulent losses. A related but distinct argument, which also arises in defense of provisions like the Alternative Minimum Tax, is that asymmetries limit the extent to which taxpayers can engage in "excessive" or in some other way unintended use of legal tax provisions to reduce tax liabilities. For example, if capital investment qualifies for accelerated depreciation allowances and nominal interest payments are tax deductible, then financing investment with a high fraction of debt may well generate tax losses, especially in the investment project's early years. Forcing losses to be carried forward might then be a tool for policy makers who view the combined tax benefits of accelerated depreciation and interest deductibility as too large.

While tax asymmetries have a policy rationale, they have other well-explored economic consequences as well, potentially discouraging risk taking, raising the cost of capital for some

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firms, and influencing the mix of investment choices that firms make. The importance of such economic costs depends on the pervasiveness and dynamic properties of tax losses. If few firms have tax losses at any given time, and if having tax losses is typically a very temporary phenomenon, then tax asymmetries are relatively unimportant; those few firms that are affected will be able to use carry-back and carry-forward provisions to get nearly full value from the deduction of losses. But as losses become more common and persistent, the costs of asymmetric treatment may rise, making this policy lever potentially less attractive at achieving its perceived ends. Thus, empirical evidence on the frequency and duration of corporate net operating losses is quite relevant for policy.

Empirical work from earlier periods, for example by Auerbach and Poterba (1987a) and Altshuler and Auerbach (1990), found that tax asymmetries were quantitatively important in the U.S. corporate sector. However, the recent behavior of tax losses, as documented in Auerbach (2007) and Cooper and Knittel (2006), suggests that tax losses may have become an even more important phenomenon in the U.S. corporate sector in recent years. Looking exclusively at non-financial corporations, for example, Auerbach found that the ratio of losses to positive income was much higher during the recession of 2001-2 than in earlier recessions, even in recessions of greater severity; Cooper and Knittel found that a significant share of these losses were not being utilized as deductions against other income in the short run. While losses have receded during the past few years, we lack a full understanding of why losses surged earlier in the decade and hence the extent to which they are likely to do so again.

There are several potential candidates to explain why losses increased. One is an increase in the dispersion of outcomes among corporations, i.e., that the lower tail of the corporate profits distribution determining the occurrence of tax losses has thickened. There is

evidence suggesting increased recent dispersion in growth rates among public corporations (e.g.,
Comin and Philippon 2005, Davis *et al.* 2006). If dispersion has increased, this could be due to a
shift in the composition of activity into more volatile sectors, an increase in overall volatility, or
perhaps a shift of less volatile activity away from public corporations and into alternative forms
of organization (or a shift of more volatile activities into public corporations).[1]

A second possible explanation for the increase in corporate losses is a decline in the rate
of profit, i.e., a downward shift in the distribution of corporate profits, which would push more
of the distribution below zero, even without an increase in dispersion. Although some evidence
on this hypothesis was presented by Auerbach (2007), we consider it further below. We also
consider the potential importance of a third explanation for increased losses, an increasing gap
between corporate profits as measured by the national income and product accounts (NIPA) and
corporate profits subject to tax, i.e., a decline in profits as measured by the tax code holding
"true" profits fixed. We look closely at the difference between corporate profits in the national
income accounts and income reported for tax purposes.

We also take into account the impact on corporate tax liabilities of the significant use of
stock options as a form of executive compensation during the late 1990s as well as the temporary
tax benefits enacted late in our sample period to spur domestic investment, specifically the bonus
depreciation provisions adopted in 2002 and expanded in 2003 and the one year dividend
repatriation tax holiday enacted with the American Jobs Creation Act of 2004. Then, we
consider changes in organizational form, in particular the rising importance of S corporations as
an alternative structure, asking whether the division of firms between the two sectors can help us
understand what has been happening among C corporations.

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[1] Some support for this last possibility comes from the finding of Davis *et al*. (2006) that dispersion of growth rates
has increased over time among public corporations, but not for the U.S. business sector as a whole.

These different possible explanations for the recent increase in corporate losses have different policy implications. An increase in overall volatility, for example, might lessen the attractiveness of using tax asymmetries to achieve other objectives; the same would be true for a decline in the overall rate of profit. If, however, observed changes are due to shifts between traditional corporations and other business sectors, then one should consider the potential effects of taxation on the choice of organizational form and the costs and benefits of having different tax rules applying to these different entity types. And, if losses are occurring because of a decline in the share of income declared for tax purposes, then tax asymmetries might simply be achieving the objective of limiting tax benefits.

In our analysis below, we address the relative importance of these different explanations for increasing corporate losses, using a comprehensive sample of the tax returns of U.S. corporations for the period 1982-2005. We find that making corrections for the surge in deductions of stock option expenses on corporate returns as well as the "excess" benefits of bonus depreciation and the repatriation tax holiday does explain part of the recent run-up in losses. Not surprisingly, these corrections have bigger impacts in some industries (Information, for example, which made heavy use of stock options) than in others. But even with these adjustments, there remains a substantial increase in tax losses earlier in this decade among C corporations to be explained. In mechanical terms, this surge can be attributed to a decline in the average rate of return as measured for tax purposes, rather than to an increase in the dispersion of rates of return among firms. The increasing importance of S corporations as alternatives to C corporations shows some potential to help explain the recent experience within the C corporate sector, because S corporations have exhibited a quite different pattern of losses in recent years.

But no simple explanation based on shifts between the C and S sectors seems adequate to explain why the experiences of C and S corporations have diverged.

The paper is organized as follows. We begin, in the next section, with a description of our data. This section also discusses the various statistical measures used in our analysis. We present our results for C corporations in Sections III and IV. We start in Section III by examining the trend in losses and the extent to which changes in the composition of C corporations explains the recent increase in losses. We then examine trends in the net rate of return on assets held in C corporations and the dispersion of returns in Section IV. We turn to an analysis of S corporations in Section V, consider and discard some further possible explanations in Section VI, and offer some concluding comments in Section VII.

II. Data and Analytic Measures

We use the IRS Statistics of Income (SOI) corporate tax return files for tax years 1982 to 2005 for our analysis. The SOI sample for each year is composed of approximately 100,000 to 140,000 firms that are sampled based on asset size and gross proceeds. The annual samples include traditional C corporations, as well as entities that pass earnings through to shareholders: S corporations, Regulated Investment Companies, such as mutual funds (RICs) and Real Estate Investment Trusts (REITs). Weights are used to make the sample representative of the corporate population.[2] The sampling weights differ by type of corporation but are equal to one for all filers with more than $10 million in assets in 2005, for example, i.e., all large corporations are included.

We divide the dataset into C and S corporation samples. Our C corporation file excludes RICs and REITs, which are not subject to the corporate tax and have very specific investment

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[2] The target population consists of all returns of active corporations organized for profit.

purposes. In some of our analysis, we focus on the population of nonfinancial C corporations (NFCs). This allows us to compare the aggregate net income and asset information from our file to data from NIPA and the Federal Reserve's Flow of Funds Accounts. We consider S corporations separately since they pay no Federal income taxes directly – they pass reported net income (and net losses) through to their shareholders. The S corporate form grew dramatically over our sample period with S corporations accounting for more than half of all returns filed from 1997 onward.

The data included in the SOI file for each firm-year is pulled from the firm's basic tax return, Form 1120. This form includes both income and tax information along with items from the firm's balance sheet. The data provided on the Form 1120 allow us to examine various groups of firms to see whether trends differ based on firm characteristics. In some of our analysis, we divide firms by either industry, net assets (expressed in real 2000 dollars using the GDP deflator), or age classifications. In addition, information on the Form 1120 allows us to divide firms by whether they have foreign operations and, further, by whether they are majority-owned by U.S. or foreign shareholders. With this information we can examine four groups of U.S. firms separately: U.S- controlled domestic corporations, U.S.-controlled multinational corporations, foreign-controlled domestic corporations, and foreign-controlled multinational corporations. As explained further below, the fourth group consists of foreign-controlled corporations operating in the United States that have their own foreign operations.[3]

Our focus is on corporate tax revenues and, in particular, the recent surge in net operating losses (NOLs). We use two key pieces of data from the tax returns to study trends in losses: net

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[3] Our breakdown of firms also includes a fifth category of firms, those that file the form 1120-F. The 1120-F is filed by foreign corporations with income effectively connected with a U.S. trade or business. These firms are distinct from foreign-owned U.S. corporations. There are many such firms in our sample, but they typically account for only around 2 percent of losses and less than 1 percent of positive income.

income and net assets. Gross income minus most deductions appears on line 28 of the 1120 form. To calculate taxable income, firms subtract from line 28 their net operating loss deduction (generated by losses carried forward from a previous year) and their partial dividends received deduction, provided to reduce the cascading effect of multiple layers of corporate taxation imposed on inter-corporate dividends. We define net income for the purpose of our study as line 28 minus the dividend received deduction. This measure reflects income minus deductions available to the firm before any losses are applied from previous years. For multinational corporations, this measure of income includes any foreign income or loss.

Net income reported by S corporations on their version of Form 1120, called Form 1120S, does not include portfolio and rental income. However, portfolio and rental income earned on the firm's assets is reported on a separate schedule (Schedule K) and can be added back to net income to obtain a measure of firm income that most closely corresponds to the income reported by C corporations.[4]

Net assets (end of year assets minus end of year liabilities) are reported on the balance sheet section of the 1120 form. Prior to using our sample, we used aggregate information from SOI to check the extent to which assets and income in our data covers the SOI universe. We find our aggregates are closely aligned with the published SOI aggregates for assets and income in every year.

We use three key measures to interpret these data. The simplest is the average rate of return, the ratio of net income to net assets weighted by net assets. Note that income is measured before deduction for past net operating losses, and so is income (possibly negative) from the current year's operations. Income is also measured before tax credits, such as the foreign tax

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[4] This information is only partially available before 1991 in our file, so S corporation measures for prior years – when S corporate activity was relatively insignificant in any event – should be regarded with some caution.

credits and (prior to 1986) the investment tax credit.   To measure the importance of losses, we

primarily use the ratio of losses (total net income for firms with negative income) to positive

income (which we simply call income) in the particular year for the group of firms considered.

We prefer this summary measure to one based on the share of firms experiencing a loss, because

it picks up the intensity of losses rather than just their existence. Finally, to measure dispersion

of outcomes, we use the mean absolute deviation in the rate of return among firms, again

weighted by net assets. We use the mean absolute deviation rather than the standard deviation or

variance because it limits the influence of extreme observations.[5]

Some firms report negative or zero net assets. While we include these firms in our

aggregate statistics, we set both net assets and net income for them to zero when constructing

measures of the rate of return, for which there is no meaning unless assets are positive. As we

discuss further in the next section, the pattern of losses over income over our sample period

remains the same when we exclude these firms from the analysis.

Our three measures, the mean rate of return, which we denote μ, the mean absolute

deviation (M) and the ratio of losses to positive income (L/I), are interrelated. A shift upward in

μ, holding M, constant, should move the distribution to the right and hence reduce L/I. An

increase in M, holding μ constant, should increase the share of the distribution of firms

experiencing losses and increase L/I. In fact, under reasonable assumptions, the ratio μ/M will

be a sufficient statistic for L/I. These assumptions, and the relationship between L/I and μ/M for

particular distributions of returns, are discussed in the Appendix.

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[5] Because of the noise in our measures of assets and income, there are some firms, particularly smaller firms, with
wild swings in measured rates of returns. Although these firms are not a significant share of the sample, as a share
of assets or income, they can have considerable influence on measured variance, which is based on squared
deviations, even when weighted by assets.

III. Basic Results for C Corporations

A useful place to start our analysis is Figure 1, which graphs the ratio of corporate tax revenues to GDP for fiscal years 1962-2007. After a prolonged drop over the first two decades, the ratio has fluctuated around 2 percent of GDP in the years since, falling in recessions and rising during booms as one would expect given the volatile procyclical nature of corporate profits.[6] Indeed during fiscal years 2006 and 2007, corporate profits tax collections reached their highest shares of GDP since the 1970s. Prior to this recent surge, however, were the recession of the early 1990s and a drop in corporate tax revenues. It is the behavior of tax losses, rather than just tax revenues, during this period that is of particular interest.

A. The Significance of Losses

We turn now to an analysis of tax losses, using our sample of individual corporate tax returns. Figure 2 shows the fraction of firms with negative net income divided by the fraction of firms with positive net income as well as the ratio L/I for all C corporations. The ratio of firms with losses to firms without losses varies from about .67 to more than .90 over the sample period.[7] This fraction decreases from the recession year of 1982, increases during the recession of 1990-1991, begins to rise again in 1999 and peaks in 2002. Losses over income, however, show a more dramatic increase beginning in 1998 with the run up being even more pronounced for NFCs, a puzzling development noted by Auerbach (1997) in his analysis based on publicly available data.

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[6] See Auerbach and Poterba (1987b) for a thorough analysis of declining in corporate tax revenues in the 1960s, 1970s and mid-1980s. Their results suggest that while legislative changes were important contributors to the fall in corporate tax revenues, they accounted for less than half of the change over this period. Reduced profitability, which shrunk the corporate tax base, was the single most important cause of declining corporate taxes.

[7] The corresponding series for NFCs is very similar.

What is puzzling is that the ratio of losses to income increased in the late 1990s when profits were healthy and that the ratio was so high earlier in this decade. The nature of this puzzle can be seen by comparing the *L/I* series with the series represented by the dotted line, based on the right axis, for the growth rate of real GDP. The series movements are negatively correlated, as one would expect, but the recent surge in *L/I* corresponds to no such sharp movement in the GDP growth rate; nor, for that matter, is there a surge in GDP growth to explain the equally precipitous drop in *L/I* that followed.

As mentioned above, some firms in our sample report negative or zero net assets. These firms are responsible for about 36 percent of losses (and less then 4 percent of gains) on average in each sample year. This fraction falls during periods of slow economic growth. For instance, in 1982 and 2001, losses associated with negative net asset firms made-up 28 percent and 26 percent, respectively, of total losses. The bottom line depicted in Figure 2 shows that excluding these firms from the analysis does not alter general pattern of losses over income for our time period.

B. Looking Beneath Aggregate Trends

There have been significant changes in the composition of the universe of C corporations since 1982. Might an explanation for the surge in the prevalence of losses be due to a shift toward sectors more prone to losses? We consider this issue, disaggregating firms according to a variety of criteria.

Industrial Composition

We start by considering whether changes in industrial composition could explain recent trends in losses. Some industries are more volatile than others, and some may be otherwise more prone to losses. Shifts in corporate activity toward industries more subject to losses might help

explain why aggregate losses rose in recent years. Figure 3 shows the ratio of losses to income since 1982 for the three industrial categories accounting for the largest share of net assets in 2005, Manufacturing, Finance, and Information. The ratio for Manufacturing resembles that for the corporate sector as a whole, in terms of its general level and its upward movement in 2001-2. Information exhibits a much stronger rise in losses during the same period, the dot-com bust having led to a situation in which losses far exceeded income in the industry. Finance, on the other hand, has experienced a strong decline in the ratio of losses to income early in the period and a generally declining ratio in the years that followed. While the Information industry has grown in importance since 1982 (from 6 percent of net assets to 10 percent in 2005), suggesting a reason why losses might have increased, so has Finance (from 21 percent of net assets in 1982 to 41 percent in 2005), which pushes in the other direction. On balance, it is difficult to determine the net effect of changes in industrial composition without considering other industries as well, which we will do shortly.

Multinational Activity

Over the years, the tax-related activities of multinational companies have received considerable scrutiny, with suggestions that multinationals operating within the United States may shift profits to lower-tax countries for tax purposes.[8] The growing importance of multinationals, therefore, might be suspected to have played a role in declining reported U.S. profits and increased U.S. losses.

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[8] Evidence of income shifting, captured by a strong negative relationship between profitability and local statutory tax rates, goes back a long way (see Grubert and Mutti 1991, Hines and Rice, 1994, among others). For a recent review of this literature and the literature on taxes and multinational corporations more generally, see Gordon and Hines (2002). More recently, Altshuler and Grubert (2006) provide evidence that income shifting has increased based on a comparison of Treasury data for U.S. manufacturing subsidiaries operating abroad in 1996 and 2000. For recent studies of the profitability of foreign-controlled and U.S.-controlled corporations see Grubert (2008) and GAO (2008).

Using information from corporate tax returns, we separate U.S. firms by whether they are U.S.- or foreign-controlled and whether they have operations abroad. We classify a firm as being U.S.-controlled if 50 percent or more of shareholders are U.S. citizens.[9] We identify multinational corporations by looking for the presence of income from foreign affiliates and other identifiers that would indicate foreign operations on the tax return. This leaves us with four mutually exclusive categories of U.S. firms (which, in combination with foreign firms filing form 1120-F, account for all the firms in our sample): U.S.-owned multinational firms, foreign-owned multinational firms, U.S.-owned domestic firms, and foreign-owned domestic firms. Foreign-owned multinationals are foreign controlled firms operating in the United States that we identify as having foreign operations through inspection of their 1120 form.

Net assets held in U.S. controlled multinationals increased from 47 percent of total assets in our sample in 1982 to more than 70 percent in 2005. Over the same period, net assets held in foreign-controlled multinationals increased from about 2 percent in 1982 to 10 percent in 2005 making the share of net assets held in multinationals 80 percent in 2005. The share of net assets held in foreign-controlled domestic firms was fairly stable over our sample period at about 4 percent. The same is not true for U.S.-controlled domestic corporations which fell in importance (as measured by net assets) from almost half of net assets (about 47 percent) in 1982 to less than 15 percent in 2005.

Figure 4 shows the loss/income ratio for U.S.- and foreign-controlled multinational and domestic firms since 1982.[10] Three patterns are clear. First, the loss-income ratio follows the

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[9] This information is available on Schedule K ("Other Information") of the 1120 form.

[10] For 1990 and 1991, we have information only on the domestic-multinational split, not on whether the firms are U.S.- or foreign controlled. For these two years, we impute the division of domestic and multinational income and assets into their two respective ownership categories using linear interpolation of income and asset shares between 1989 and 1992.

same pattern over time for all firms that we saw in Figure 2 (with the exception of foreign-controlled multinationals in 1991). Second, for both our domestic and multinational firm groupings, foreign-controlled firms have higher ratios of losses to income. Finally and most importantly, multinationals have much lower ratios of losses to income (again with the exception of foreign-controlled multinationals in 1991) than domestic corporations. Thus, although the growing importance of foreign control might help explain why losses rose in recent years, the growing importance of multinationals appears to work strongly in the opposite direction.

Firm Size and Age

Smaller firms may be less profitable or subject to more dispersion of outcomes than larger firms, the combination potentially leading to a higher ratio of losses to income. Indeed, the loss-income ratios shown in Figure 5 confirm this conjecture. The figure plots the ratios for firms broken down by the real ($2000) value of net assets. The relationship of size to the loss-income ratio is basically monotonic, with losses becoming less important as firm size grows, and all size categories have an otherwise similar pattern over time   Thus, even though all categories of firms experienced an increase in losses in 2001-2, a shift in composition to smaller firms might help explain the size of the observed surge in losses.

A related argument might apply to firm age, that younger firms are more likely to experience losses. Again, the data are consistent with this hypothesis, as shown in Figure 6, which breaks firms down by their age in a given year, based on their date of incorporation. The younger the class of firms, the higher is the ratio of losses to income. Again, the patterns are similar except for the differences in levels, so a recent shift in composition to younger firms could help explain the increase in losses.

Except for the breakdown by industry, our different decompositions have not uncovered differences in time patterns of the ratio of losses to income. This finding, in itself, is extremely interesting, because it suggests that whatever was driving the recent rise in losses was not related to firm size, firm age, or whether the firm is a multinational. Still, differences in the levels of the loss-income ratios mean that shifts in the composition of production might affect the aggregate trend and perhaps help explain the extent to which losses rose in recent years.

Figure 7 allows us to address this possibility. The heavy, solid line in the figure is the actual ratio of losses to income for our sample period. Each of the other lines shows what the ratio would have been had the composition of net assets remained as in 1982, according to each of the breakdowns we have just discussed, but with the ratio of losses to income in each category following its actual series. That is, each series tells us what the loss-income ratio would have been, *ceteris paribus*, had a particular change in asset composition not occurred. From the figure, we see that the net impact of the shifts to multinational activity and toward foreign ownership actually reduced the prevalence of losses, under the assumption that the loss-income ratios of the four categories of firms (U.S./foreign controlled by domestic/multinational) would have been the same as we observe even without the shifts of ownership and control. An even stronger shift in the "wrong" direction is attributable to shifts in firm size, because the trend in the C corporate sector has been toward larger firms, with lower ratios of losses to income. Industrial shifts show little net impact, the contribution of the Information industry, and other growing industries with high losses, being offset by the strong growth and low (and declining) losses of the Finance industry. Figure 7 reveals that the only change in the composition of assets that appears to help explain why losses have risen is by firm age. Holding other factors constant,

had the recent growth in the share of assets accounted for by new firms not occurred, then the surge in losses in 2001-2 might have been somewhat muted.[11] However, even this adjustment exerts a relatively small impact on the recent rise in losses.

C. Stock Options, Bonus Depreciation, and the Repatriation Tax Holiday

Summing up, there is little in the changing composition of the C corporate sector to help us understand why losses surged so much in 2001-2 and dropped so sharply thereafter. During this period, however, there were some important phenomena that may have affected net income reported on corporate tax returns by altering the timing and level of deductions for executive compensation, depreciation, and dividends received from foreign subsidiaries.

First, the use of stock options as a form of compensation surged in the 1990s. There are two types of stock options that can be granted to employees: incentive stock options (ISOs) and nonstatutory stock options (also referred to as nonqualified stock options, or NSOs). These two types of options have different tax consequences, but the treatment of nonqualified options is most relevant, because such options accounted for the vast majority of executive stock options during this period. For nonqualified options, there are no tax consequences until options are actually exercised, when individuals take into income the spread between market and strike prices times the number of shares purchased, and companies deduct the same amount. Thus, the tax treatment of options shifts the timing of compensation from the year of grant to the later year of exercise. Further, to the extent that the value of the spread, *ex post*, exceeds the expected value of the compensation at the time of the grant, the tax deduction may exceed the anticipated compensation.

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[11] Davis *et al.* (2006) attribute the increased dispersion in growth rates among public corporations to the rise in importance of younger firms.

The dramatic growth in stock options through the 1990s has been well documented by researchers. This form of compensation, while small relative to wages and salaries, can have a significant impact on corporate (and individual) tax liabilities. Jaquette, Knittel and Russo (2003), estimate that if fully utilized, spread income deductions reduced corporate tax liabilities by $17 billion in 1997, $24 billion in 1998, $36 billion in 1999, $44 billion in 2000 and $27 billon in 2001.[12] Following the methodology of Jaquette *et al*. we use information from corporate 10-K filings and annual reports from 1997 to 2004 to estimate spread income and then match this information to the tax return data.[13] To "correct" for the recent use of stock options, we add back spread income for the firms for which we have information. As discussed in Jaquette *et al*. adding back spread income to net income to determine the impact of stock options on losses, for example, overcorrects since we do not add back the value of the equivalent compensation as of the granting of options. That is, a full correction for options would replace reported option expense with the estimated value of the options at the time they were granted. Our approach, therefore, represents an upper bound for the impact of options in any given year.

We also take into consideration two temporary tax incentives that may explain part of the sharp increase in losses over income, as well as the subsequent drop, in the last part of our sample: bonus depreciation and the repatriation tax holiday. Bonus depreciation, a form of accelerated depreciation, was adopted in 2002 and expanded in 2003 before expiring at the end of 2004. For tax year 2002, firms could immediately deduct 30 percent of qualified investment expenses, writing off the remaining asset basis according to the previously specified depreciation

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[12] For overlapping years studied, our results are consistent with those of Mehran and Tracy (2001), once one takes account of differences in timing conventions.

[13] Our stock option sample was generally based on the financial filings of the S&P 500 and Nasdaq 100 and we estimate that these firms accounted for approximately 85-90 percent of all corporate non-qualified stock option deductions. We do not include any adjustment for the residual 10-15 percent that we think we do not capture.

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schedule. For 2003 and 2004, the fraction was increased to 50 percent. As a consequence, tax deductions (holding investment constant) increased in 2002 and decreased in 2005 (as a result of greater prior deductions for assets purchased during the period 2002-4), with offsetting effects in 2003 and 2004, when some assets would have received higher depreciation deductions and others (purchased in prior bonus depreciation years) receiving lower deductions. We "correct" for the acceleration of depreciation by adding to net income the difference in depreciation deductions between the amount specified by regular depreciation schedules and the amount actually claimed.[14]

Our final adjustment is for the temporary repatriation tax holiday enacted in the American Jobs Creation Act of 2004. To understand the benefits of the tax holiday it is necessary to understand the tax treatment of foreign profits. Under current U.S. tax law, both the domestic and foreign earnings of U.S. corporations are subject to U.S. taxation. If foreign operations are organized as subsidiaries (i.e., they are separately incorporated in the foreign country), then active business profits are not generally taxed until they are remitted to the U.S. parent corporation. To alleviate the double taxation of foreign source income, firms are allowed to claim credits for income taxes paid to foreign governments against U.S. tax liability on foreign source income. The credit is limited to the U.S. tax liability on the foreign source income. If a firm's foreign tax payments are less than the limitation, the firm pays a "repatriation tax" equal to the difference between the U.S. and the foreign tax on the income remitted.

AJCA included a provision that extended the dividends received deduction for intercorporate dividends to repatriated earnings, allowing firms to deduct 85 percent of qualified cash dividends received from foreign subsidiaries from U.S. taxation. This provision, which

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[14] The procedure not only computes the counterfactual for bonus depreciation claimed in the same year but also the effect on depreciation deductions for any bonus claimed in prior years.

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effectively reduced the repatriation tax by 85 percent, led to a surge in the repatriation of

earnings which might have increased reported earnings, particularly in 2005. To "correct" for

the surge in repatriations due to the tax holiday, we eliminated the remaining 15 percent of

qualifying dividends from net income.[15] This will represent an overcorrection if some of these

repatriations would have occurred anyway.

Figure 8 shows the impact of these three adjustments to income for all C corporations,

and for two groups of C corporations for which the net effects are particularly significant, those

in the Information industry and those aged 6-10 years. (The effects for other categories of firms

are shown in Figures A3-A6 in the Appendix, which correspond to Figures 3-6 in the paper.)

For each corporate category, the unadjusted series is depicted by a thick line and the adjusted

series by the corresponding thin line. The impact prior to 2002 is entirely due to the options

adjustment, which also became less significant as the other adjustments came into play. The

options adjustment reduces the growth in the loss-income ratio, helping to explain why losses

increased beginning in the late '90s as well as the spike the followed. The collapse of the stock

market early in this decade reduced the importance of stock option deductions, and by 2005 the

remaining adjustments, both reducing income, have a small impact. In summary, these three

corrections help explain why the loss-income ratio rose so much starting in the late 1990s, but

this is clearly only part of the story. Even the adjusted series leave us with a substantial puzzle,

and so we turn now to other potential factors.

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[15] That is, we took the total amount reported by firms on Schedule C, line 12 for 2005 (which is where qualified repatriated dividends were to be reported), multiplied that amount by 15 percent and then deducted that from net income. The residual 85 percent should already have been removed through the dividend received deduction which, as explained above, we include in our definition of net income.

IV. The Evolution and Dispersion of Profits Earned by C Corporations

As discussed above in section II, the ratio of losses to income can be related to the mean rate of return μ and the mean absolute deviation M, for any given distribution of returns We start by examining how the mean rate of return on net assets, μ, has changed over time.

Figure 9 shows the mean rate of return on assets for our C corporation sample with and without the adjustments for income just discussed (stock options, bonus depreciation and the repatriation tax holiday), the unadjusted series labeled "baseline" and the adjusted series labeled "Income Adjusted." The third series in the figure, denoted "Income and Assets Adjusted," includes a further adjustment, which we discuss below. The figure suggests that the increase in prevalence of losses is due at least in part to a drop in the rate of profit, as measured for tax purposes. The baseline mean rate of return on assets rises and falls with the economy but begins to decline more dramatically than in previous periods in the late 1990s. Although the economy picks up in the later years and the measured rate of return increases, the rate of return on assets between 2000 and 2004 was lower than it was in the trough of the earlier recession. Adjusting the rate of return for stock options, bonus depreciation, and the repatriation tax holiday reduces the drop off in profits in the late 1990s but still leaves us with a series that shows a dramatic decline in rates of return on corporate assets.

It is possible that losses have increased simply because rates of return have decreased, and not because of any increase in dispersion. Figure 10 shows our measure of dispersion, the mean absolute deviation, M. As in Figure 9 we show the baseline series along with the income adjusted series and the income and assets adjusted series discussed further below. The baseline mean absolute deviation series actually shows a relatively steady decline throughout almost the entire period with an upswing in the last year of the sample. Increased dispersion does not seem

to be the reason losses were so prominent early in the 2000s. Our income adjustments have some impact in the late 1990s, but do not change the story significantly.

A. Asset Measurement Issues

While using tax return data allows us to measure net operating losses, this data source is not ideal for measuring the rate of return on assets. As discussed above, our measure of μ shows sharp drops in 2001-2002 relative to any other year both with and without our "correction" for income measurement due to stock options, bonus depreciation, and the repatriation tax holiday. It is possible that the drop in the mean rate of return is overstated due to how firms are required to report their assets on tax returns

The book values of assets that are reported on the balance sheet section of the tax return (Schedule L of the Form 1120) are stated at historical and not current costs. This leads to an understatement of assets and hence an overstatement of rates of return, particularly during the early period of our sample when the inflation rate had recently been quite high. We do not have current cost values for firms but can make an adjustment using data from the Federal Reserve Board of Governors' Flow of Funds Accounts (FOFA). The FOFA produces estimates of end-of-year net worth (assets minus liabilities) measured at market value for various sectors, including NFCs.[16] There is no comparable measure for all corporations (i.e., including the financial corporations in our sample), and the FOFA measure covers both C and S corporations, rather than just C corporations. However, if we assume that the degree of mismeasurement is the same for all corporations as for NFCs, and that it is the same for C corporations as for C and S corporations together, then we can apply this estimate of mismeasurement to correct our measured assets for the C corporate sector.

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[16] There is no information provided among NFCs at a more disaggregate level.

Note further that, if we assume that this mismeasurement applies uniformly to all firms in a given year, then the mean absolute deviation will change by the same percentage as the average return. For example, if we determine that net assets are actually two times their reported book value for each firm, then each firm's estimated return will be halved, and so will the average return and the mean absolute deviation based on these adjusted returns. Note that when we calculate average returns, we use income measures that are already adjusted for stock options, bonus depreciation and the repatriation holiday.

Based on this methodology, we adjust the annual values of μ and M, with the resulting series denoted "Income and Assets Adjusted" in Figures 9 and 10, respectively. These asset-adjusted values of μ and M are lower throughout the period, because market values exceed book values, and fall less quickly, as we predicted based on the decreasing importance of the historic-cost understatement. While the asset-adjusted rate of return falls less dramatically in 2001 and 2002, the profit rate measured using the SOI data still shows a large drop in 2001-2, to a level much lower than during the recession of 1990-1 and even below the very serious recession year of 1982. Note that the mean absolute deviation, once corrected, no longer shows a declining trend and now looks relatively stable over time. There is even, perhaps, a small increase during the period leading up to 2000, although the values in 1992 and 2000 are roughly equal. Thus, taking the correction for asset mismeasurement into account, and considering our earlier discussion of possible changes in the distribution of returns, it appears that most of the sharp increase in losses in 2001-2 and the rise leading up to this period was due to a decline in the average rate of return on assets for C corporations, with perhaps a little due to an increase in the dispersion of rates of return.

B. *Profit Mismeasurement*

Why might the rate of return, as measured for tax purposes, decline by more than one might have predicted, based on macroeconomic factors alone? One possible explanation is an increase in the gap between profits as reported for tax purposes and those that more closely reflect the economic returns to firms. In making the conversion between income for tax purposes and its reported measure of corporate profits, the NIPA add adjustments for mismeasurement of depreciation (the CCA) and for the mismeasurement of inventory profits (the IVA). The depreciation correction undoes accelerated depreciation for tax purposes and thus increases earnings. Inventory costs are understated in the SOI data due to the use of historic cost accounting for tax purposes and so the inventory correction reduces earnings. Throughout our sample period until 2005 (when the effects of prior bonus depreciation led to a large negative value for the CCA) the net impact of two adjustments is positive, making NIPA earnings higher than earnings in the SOI data for many years. If these adjustments have increased in recent years as a share of assets, then the larger gap between income for tax purposes and NIPA income could help explain why the former measure appears very low.[17]

But this turns out not to be the case. Figure 11 shows the IVA and CCA for NFCs, relative to the FOFA net worth measure. The figure illustrates that neither the IVA nor the CCA has risen in the manner required. The IVA has little trend at all. The CCA was high in the 1980s, before the Tax Reform Act of 1986 decelerated depreciation allowances, and rose somewhat in connection with strong investment during the 1990s, fell with the drop in investment in 2001, and rose again in 2002, with the introduction of bonus depreciation.

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[17] Note that we have already taken that part of the CCA due to bonus depreciation into account in constructing our adjusted series above.

One final possible reason that income for tax purposes might have fallen is the deductibility of nominal interest payments, which overstate real interest costs by the inflation premium multiplied by the stock of outstanding debt. Adding these deductions back to taxable income provides a better measure of income after interest costs. However, this correction, also shown in Figure 11, is trendless as well, and so offers no help in explaining the recent behavior of the average rate of return.

C. Summary

We have seen that the sharp increase in the losses of C corporations earlier in this decade is not explained by any change in composition of firms but is traceable to a sharp general decline in the average rate of return, as measured for tax purposes. Correcting for biases in the measurement of assets and income leaves much of the basic story intact. Thus, the puzzle is why rates of return declined so much. In the remainder of the paper, we consider the possible role played by S corporations – entities that legally are corporations but that serve as pass-through entities for tax purposes. It is possible that changes in the division of production within the overall corporate sector, between C corporations and S corporations, could play a role in explaining why rates of return fell dramatically among C corporations beginning in the late 1990s.

V. Shifts between C and S Corporations

Over the period we are examining, there has been a very dramatic increase in the importance of S corporations within the U.S. corporate sector. Figure 12 shows the growth in

the share of net corporate income reported S corporations.[18] Between 1982 and 2001, the share

of net income in S corporations increased from 3 percent to more than 40 percent. This share has

fallen since the peak in 2001 but is still substantial. The growing importance of S corporations

for NFCs is particularly striking.

The rise in S corporations could potentially offer an explanation for the recent behavior

of profits within the C corporate sector. For example, if profitable firms were more likely to opt

for S-corporate status, then the remaining C corporations would exhibit a lower rate of return

than the corporate sector as a whole. In this section, we consider the characteristics of S

corporations and the extent to which what we observe among S corporations might help explain

the recent phenomena among C corporations.

We start by looking at the ratio of losses to income over the sample period for S

corporations. Figure 13 shows the trend in losses over income for S corporations, both adjusted

and unadjusted for income measurement problems. Note that only the adjustment for bonus

depreciation is relevant for S corporations. In contrast to the phenomena we see in C

corporations, there is no upward trend in losses for S corporations and only a small rise occurring

in 2001-3. The third series in Figure 13, labeled "adjusted, using C industry weights," is

discussed next.

A. Looking Beneath Aggregate Trends

Figure 14 compares the industrial composition of the C and S sectors, as measured by net

asset shares in 2005, the last year of our data. The figure shows that the two sectors concentrate

in different industries. As discussed above, Finance, Manufacturing and Information dominate

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[18] The share is relative to the income of C and S corporations; the denominator excludes income from other entities officially classified as corporations but less similar in form, e.g., RICs and REITs.

the C corporate sector. For S corporations, Finance and Manufacturing are still very important, but not as dominant, and the other important sectors, of roughly equal size, are Wholesale Trade, Retail Trade, Real Estate and Construction. If these latter industries have had different trends than those industries prominent among C corporations, this might help us understand the different recent trends.

We can calculate what the ratio of losses to income would have been among S corporations, had the S corporate sector had the same industrial composition as the C corporate sector in each year but otherwise the same experience within each industry as actually observed for S corporations. This is the final series shown in Figure 13. The series follows the unadjusted series fairly closely since 1991, with the adjustment imparting perhaps a small upward trend and making losses rise more in 2001-2. However, the impact is small relative to the differences between the unadjusted or adjusted series for S corporations and C corporations. Thus, differences in industrial composition at any given time, and differences in the time patterns of changes in industrial composition, explain little of the difference between C and S corporations with respect to patterns of losses.

B. Evolution and Dispersion of Rates of Return

It is possible that differences in the patterns of losses across S and C corporations are driven by differences in rates of return on assets across these two forms of business. Figure 15 shows the trends in the mean return and mean absolute deviation among S corporations. We show both series adjusted for bonus depreciation. Although the figure presents data since 1982, it is most useful to focus on the period since 1991. (As discussed above, the earlier period is subject to noisier data.) The year-to-year movements in the mean return make sense, dipping in the early '90s and again beginning in the recession year of 2001. But two very important facts

about this series are, first, that, even with the dip during 2001-3, the trend has generally been

upward since 1991, and, second, that the average return is extremely high, exceeding 20 percent

in most years since 1996. This latter characteristic suggests that assets may be significantly

understated, a serious possibility given the different manner in which assets are reported by S

corporations. This theory is further supported by the very high range in which the mean absolute

deviation falls, its values two to three times higher in recent years than those for C corporations.

If the assets of S corporations are generally understated, though, this simply means that

both the μ and M need to be shifted down by comparable adjustments, and leaves us with an

average return series trending generally upward and a mean absolute deviation series tracking the

average return fairly closely. From these series, it appears that at least some of the explanation

for the falling rate of profit for C corporations – and the rising incidence of losses among C

corporations – is the rising rate of profit for S corporations.

C. Losses over Income for the Entire Corporate Sector

Figure 16 shows the trend in losses over income for S corporations, C corporations and

the two sectors combined (shown as the series labeled "C+S"). All of the figures are adjusted

using our corrections for stock options, bonus depreciation, and the repatriation tax holiday.

While the addition of S corporations to the corporate universe does moderate the increase in the

ratio of losses to income during this period for the corporate sector as a whole, much remains left

to be explained as to why losses rose recently. Another thing revealed by Figure 16, and again

focusing on the period since 1991, is that the pattern of losses over gains for S corporations

appeared to track that for C corporations reasonably well until around 1996, staying slightly

higher during this period, a result one might have expected given that S corporations are

typically smaller and newer than C corporations. From 1996 onward, though, the two series

have diverged, with losses rising sharply for C corporations but having no clear trend for S corporations.[19]

In short, the growth in the S corporate sector as a whole, intriguing though it is for a variety of other reasons, offers only limited insight into the fall in the rate of profit and the rise in the ratio of losses to income among C corporations. While S corporations have become more profitable, this offsets only a small share of the falling return among C corporations. And there is little about the industrial mix or age structure of S corporations that reveals any pattern regarding the types of firms that might have switched status to become S corporations, or organized as S corporations rather than as C corporations. Although there are entity types other than S corporations that might serve as substitutes for firms wishing to avoid the corporate tax, these are either too small quantitatively at present (e.g., limited liability companies) or too different from C corporations in form to serve as a close substitute (e.g., partnerships) to add much to what has already been revealed by our look at S corporations.

VI. Further Possible Explanations

Before concluding, we touch briefly on two other potential explanations for the increasing incidence of losses among C corporations. The first involves capital gains. The period leading up to the 2001 recession was associated with an unusually large decline in equity values, given the mildness of the recession. To the extent that C corporations were shareholders themselves, this decline in asset values could have reduced measured rates of return, which

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[19] Given the timing of this divergence, one potential factor that could be related is the 1996 increase in limit on the number of shareholders of an S corporation from 35 to 75 (a number that increased again, to 100, in 2004). This change might potentially have made it easier for larger, more profitable companies to qualify for S corporation status. However, as of 2001, only 5 percent of assets of S corporations were held by corporations with more than 35 shareholders, so this constraint relaxation could not have played a major role in producing the observed pattern. Working in the other direction is the 1993 increase in the top-bracket individual income tax rates, which presumably made pass-through tax treatment less attractive for profitable companies.

include realized capital gains. To evaluate this factor, we recalculate income for each C corporation excluding capital gains, and compute loss-income ratios based on this new income measure. Figure 17 shows the impact of excluding capital gains in this manner. The bold line is the income-adjusted loss-income ratio for C corporations, repeated from Figure 16. The lighter solid line shows what this ratio would have been if all capital gains were excluded and the dotted line at the bottom shows the difference between these two series. As the figure shows, excluding capital gains increases the loss-income ratio, as one would expect given that capital gains are typically positive. However, this adjustment has little impact on the pattern of the loss-income ratio over time.

A second possible and as-yet unexplored explanation for the strong decline in the C corporate rate of return around the 2001 recession might be an increase in corporate leverage. The higher is leverage, the greater the impact of a decline in overall returns on the return to equity, since interest payments are fixed. To evaluate this hypothesis, we recalculate income by adding interest payments back in, and for consistency add the value of credit-market liabilities to the denominator when computing the value of the firm's assets. The resulting measure of the firm's income and rate of return neutralize the impact of any changes in leverage over time. Figure 18 shows the impact of this calculation on the income-adjusted loss-income ratio, focusing on nonfinancial corporations because the adjustment for financial liabilities makes little sense for companies that invest primarily in financial assets.[20] The figure shows the actual loss-income ratio for nonfinancial C corporations, repeated from Figure 2, what this series would have been with all borrowing and interest undone, and the ratio of these two series. Not surprisingly, the figure shows that losses would have been lower had firms not borrowed,

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[20] Because of a lack of data for earlier years, we perform this calculation beginning in 1988.

holding income before taxes and interest fixed. But, as was the case for capital gains, the adjustment provides no help in explaining the recent surge in losses, perhaps even deepening the puzzle in that the adjusted series exhibits an even more unusual pattern earlier in this decade.[21]

VII. Conclusions

We began with a question: why did the losses of C corporations rise so much earlier in the decade? We have partially answered that question. Losses went up because the average rate of return among these firms went down, and not because of an increase in the dispersion of returns or because of an increase in the gap between taxable income and a measure of income more useful for tracking economic returns. This leads to the question of why the rate of return fell, which we have been less successful in answering. Part of the fall is consistent with a shift of more profitable enterprises to the S corporate sector, but only a small part, and there are no trends evident among S corporations that tell us more about the types of firms that may have made this transition, and no obvious reason for the timing. Even though losses among C corporations have fallen considerably in very recent years, the persistent divergence between C and S corporations both before and after the surge in losses earlier in this decade suggests that there is more to be understood than a brief phenomenon.

In an earlier paper (Auerbach 2007), one of us argued that increasingly aggressive tax planning was a problematic explanation for increased losses, for generating losses provides no immediate tax benefit. However, as tax planning occurs before a firm knows what its income otherwise would be, optimal planning might still lead a firm to have losses in some states of the

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[21] This negative conclusion is reinforced if one looks at the impact of this adjustment on average returns and mean absolute deviations over time. The return to debt plus equity has a lower mean absolute deviation than the return to equity, of course, but the pattern over time is little changed. The average return to debt plus equity is less cyclically sensitive than the average return to debt, but the pattern over time is otherwise quite similar.

world; and a firm expecting profits in the future might still wish to generate losses at present to help offset future income. Thus, aggressive tax planning, perhaps reduced in recent years by the increased attention paid to corporate tax shelters, is one story consistent with what we have observed, but further research is needed to say more.[22]

We thus have replaced one question with several, in particular, why did rates of return of C corporations fall so much early in this decade and why has the incidence of losses among C and S corporations diverged during the last decade? Addressing these questions is important for understanding the effects of the corporate income tax, but likely will require investigations that go beyond the analysis of tax return data.

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[22] One possible element of tax planning might have included shifts in the timing of expenses or revenues. Because there was a temporary increase, for 2001 and 2002 only, in the number of tax years for which losses could be carried back to offset previous profits, firms anticipating losses, by deferring revenues out of 2001-2 or accelerating expenses into those tax years, might have been able to increase the deductibility of their losses. That is, losses in years after 2003 that would have had to be carried forward might have been accelerated into 2001 (2002) in order to be carried back against earnings for the period 1996-2000 (1997-2001). As the late 1990s was a period of generally strong profits, this might have been an attractive option for some firms, to the extent that they anticipated further losses and had the flexibility to alter the timing of revenues and expenses.

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Appendix

This appendix discusses the relationship between the mean rate of return, μ, the mean absolute deviation, M, and the ratio of losses to positive income, L/I. Let r be the rate of return and $f(\cdot)$ the corresponding probability density function, obtained by dividing the distribution of assets at each rate of return by total assets. That is, normalize total assets to 1 for simplicity. Then losses (defined to be positive) and positive income equal:

(A1) $L = -\int_{-\infty}^{0} rf(r)dr = -\int_{-\infty}^{\mu} rf(r)dr + \int_{0}^{\mu} rf(r)dr$; $I = \int_{0}^{\infty} rf(r)dr = \int_{\mu}^{\infty} rf(r)dr + \int_{0}^{\mu} rf(r)dr$

Note that

$$M = \int_{-\infty}^{\mu} (\mu - r)f(r)dr + \int_{\mu}^{\infty}(r - \mu)f(r)dr = \mu\left(\int_{-\infty}^{\mu} f(r)dr - \int_{\mu}^{\infty} f(r)dr\right) - \int_{-\infty}^{\mu} rf(r)dr + \int_{\mu}^{\infty} rf(r)dr$$

Assuming that the distribution $f(\cdot)$ is symmetric around μ, the term multiplying μ on the right-hand side of this expression equals zero, so we can simply write:

(A2) $M = -\int_{-\infty}^{\mu} rf(r)dr + \int_{\mu}^{\infty} rf(r)dr$

Combining terms for L and I from (A1), it may be shown that their ratio equals:

(A3) $L/I = \dfrac{M - \mu + 2\int_{0}^{\mu} rf(r)dr}{M + \mu + 2\int_{0}^{\mu} rf(r)dr}$,

It is not possible to simplify (A3) further without making further assumptions regarding distributions. For the uniform distribution, it can be shown that

$$(A4) \quad L/I = \left(\frac{1 - 1/2\,\dfrac{\mu}{M}}{1 + 1/2\,\dfrac{\mu}{M}} \right)^2$$

For the exponential distribution ($e^{-(\mu-r)}$ for $\mu > r$ and $e^{-(r-\mu)}$ for $\mu < r$),

$$(A5) \quad L/I = \frac{1}{1 + 2\,\dfrac{\mu}{M}\,e^{\frac{\mu}{M}}}$$

In both cases, the ratio of losses to income is decreasing in (μ/M), which is a sufficient statistic for the loss-income ratio. This sufficiency will hold for other two-parameter symmetric distributions (such as the normal distribution) as well. For such distributions, an increase in μ by a factor λ shifts the distribution $f(\cdot)$ to the right by $\lambda\mu$, and an increase in M by a factor λ widens the distribution uniformly by a factor λ. Hence, increasing both μ and M by the same factor λ results in a distribution for r such that the variable $r/(1+\lambda)$ has the original distribution $f(\cdot)$. It follows that L/I is unchanged, since both L and I are homogeneous of degree 1 in $(1+\lambda)$.

Figure A1 plots the functions for L/I in (A4) and (A5). These functions are quite similar, especially in the range of values of μ/M commonly observed in our data. For very high values of μ/M, the uniform distribution has lower ratios of losses to income. We can use these expressions to determine the extent to which observed changes in L/I reflect changes in μ and M as opposed to changes in the distributions themselves. The figure also plots the corresponding function for the normal distribution, based on numerical integration, showing that this function lies between those for the uniform and the exponential distributions.

Figure A2 shows the actual ratio of losses to income versus predicted ratios of losses to income using the uniform and exponential distributions. We include only those firms with positive net assets since, as mentioned above, the ratio of net income to zero or negative net assets is not meaningful. Recall from Figure 2 that the pattern of *L/I* remains the same when those firms with negative and zero net assets are removed from the analysis. Figure A2 suggests that the movements in the loss-income ratio throughout our sample period, including the recent increase and decline, can be explained reasonably well by changes in the mean and mean absolute deviation of returns. This exercise indicates that a change in the distribution of returns itself is not necessarily a key factor in explaining the trend.

Figure 1. Trends in U.S. Federal Corporate Income Tax Revenue
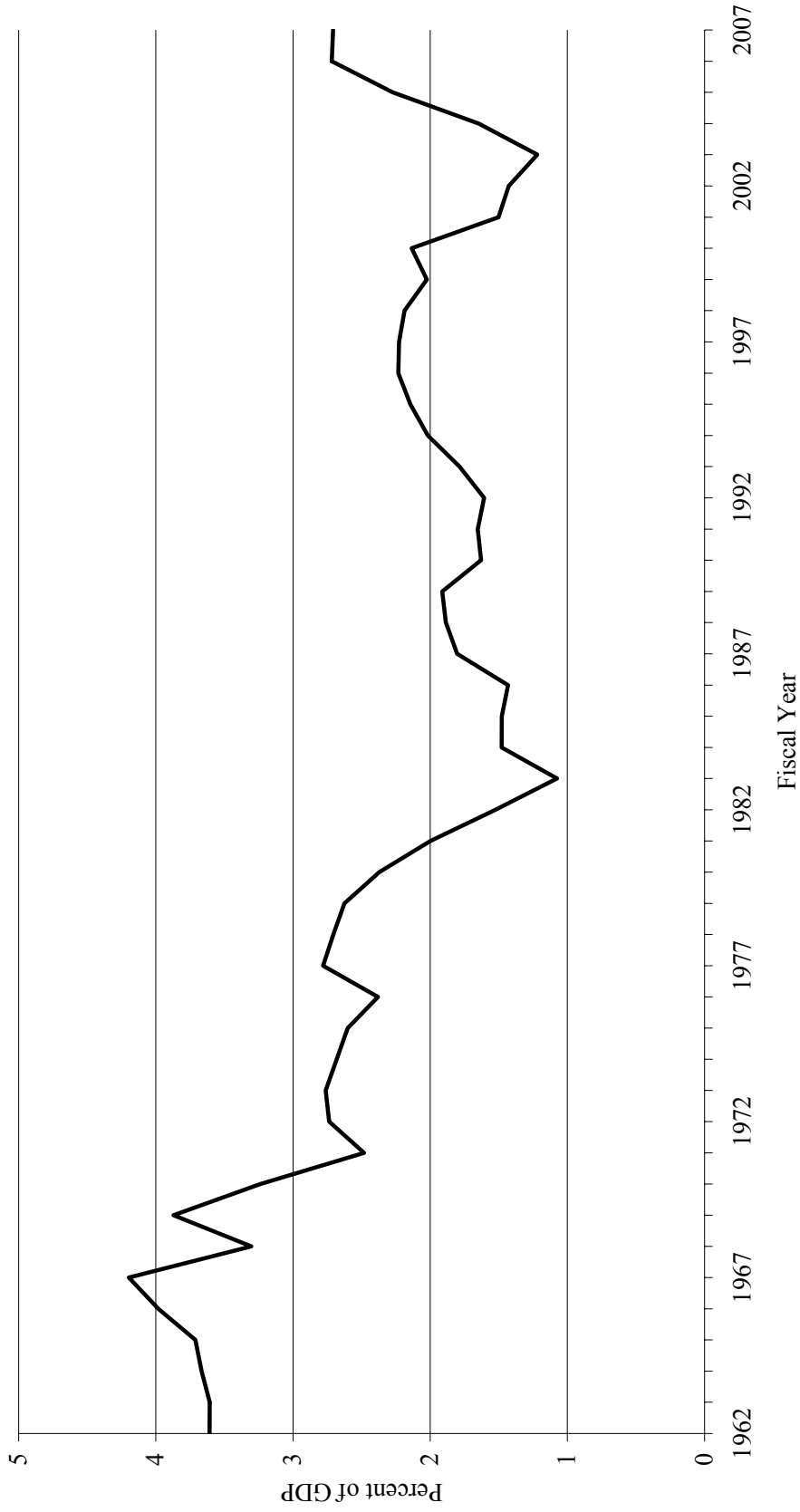
Figure 2. The Importance of Losses
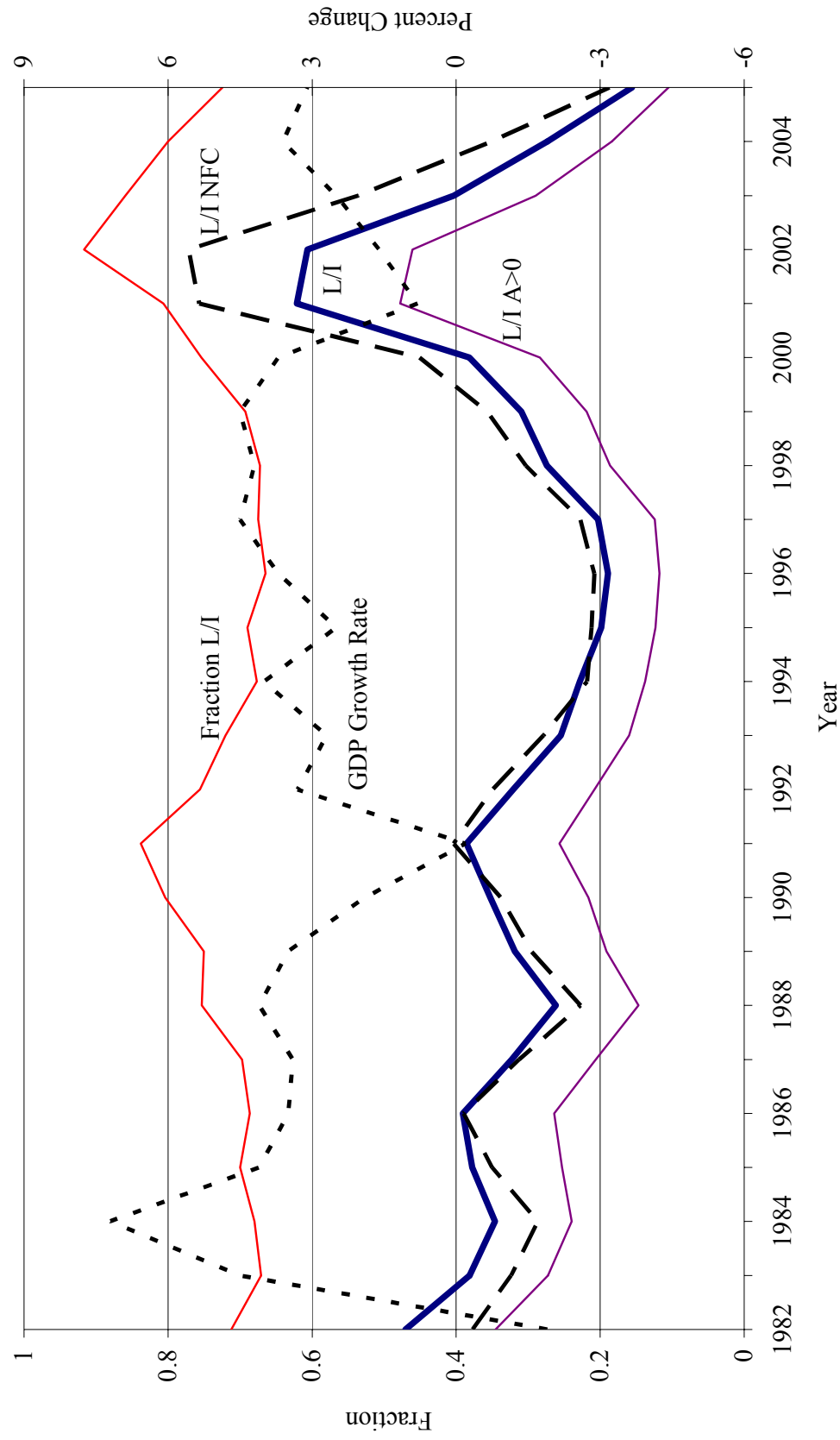
Notes: L/I is ratio of losses to income, shown in the figure for all firms, all nonfinancial firms (NFC), and all firms with positive net assets (A>0).

Fraction L/I is the ratio of the net assets of firms with losses to the net assets of firms with positive income.

Figure 3. Losses by Industrial Composition
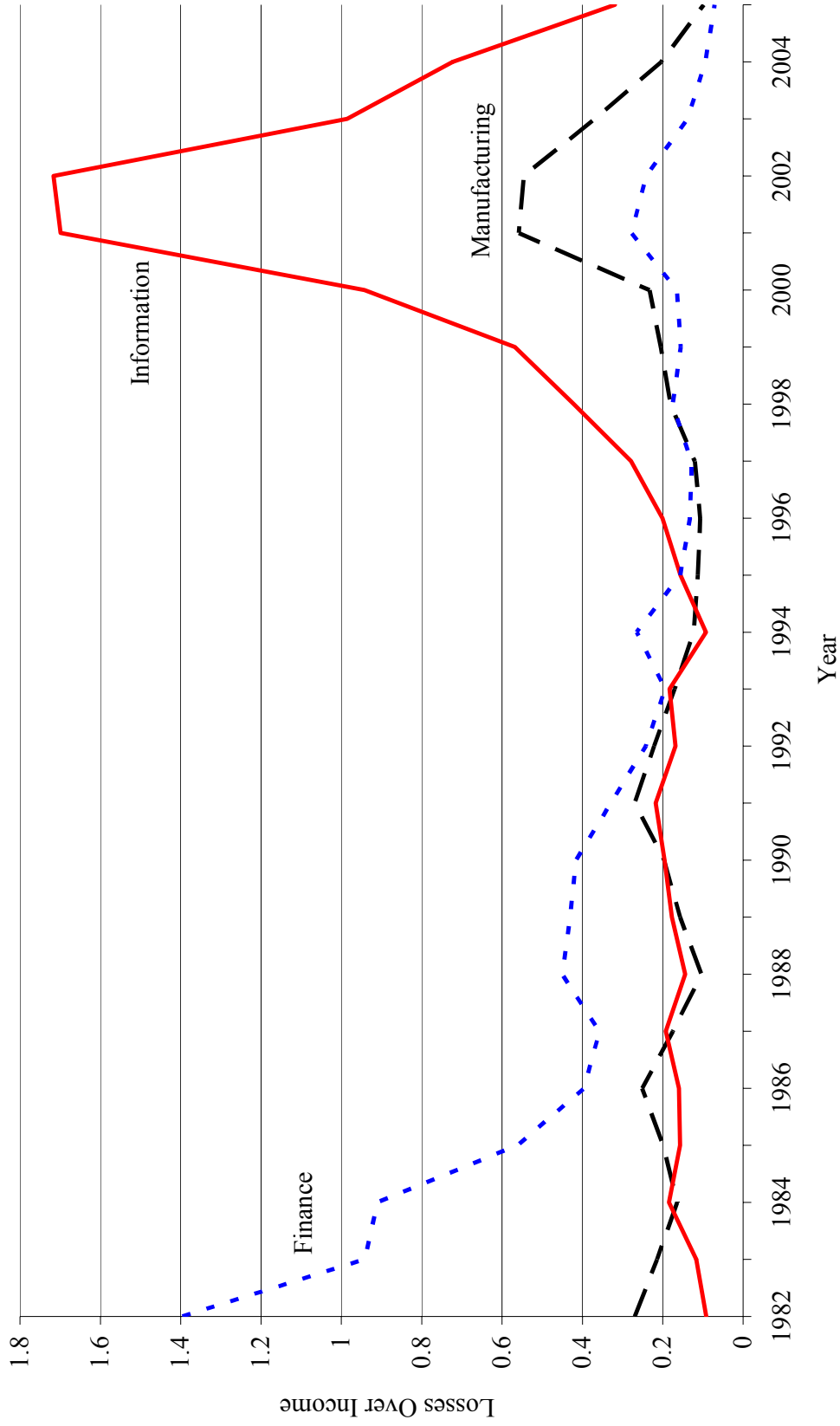
Figure 4. Losses among Multinationals and Domestic Firms
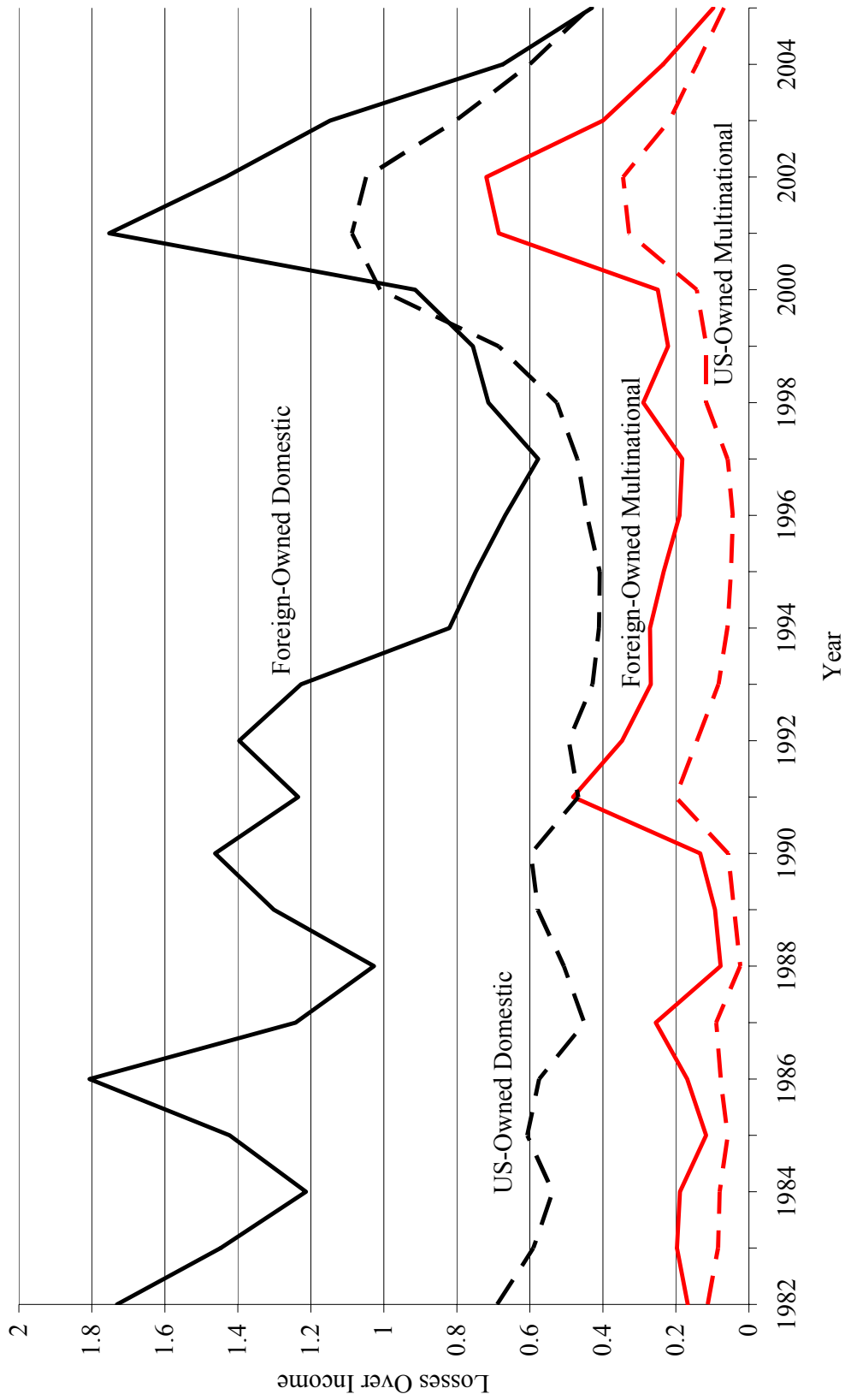
Figure 5. Losses by Real Net Firm Assets
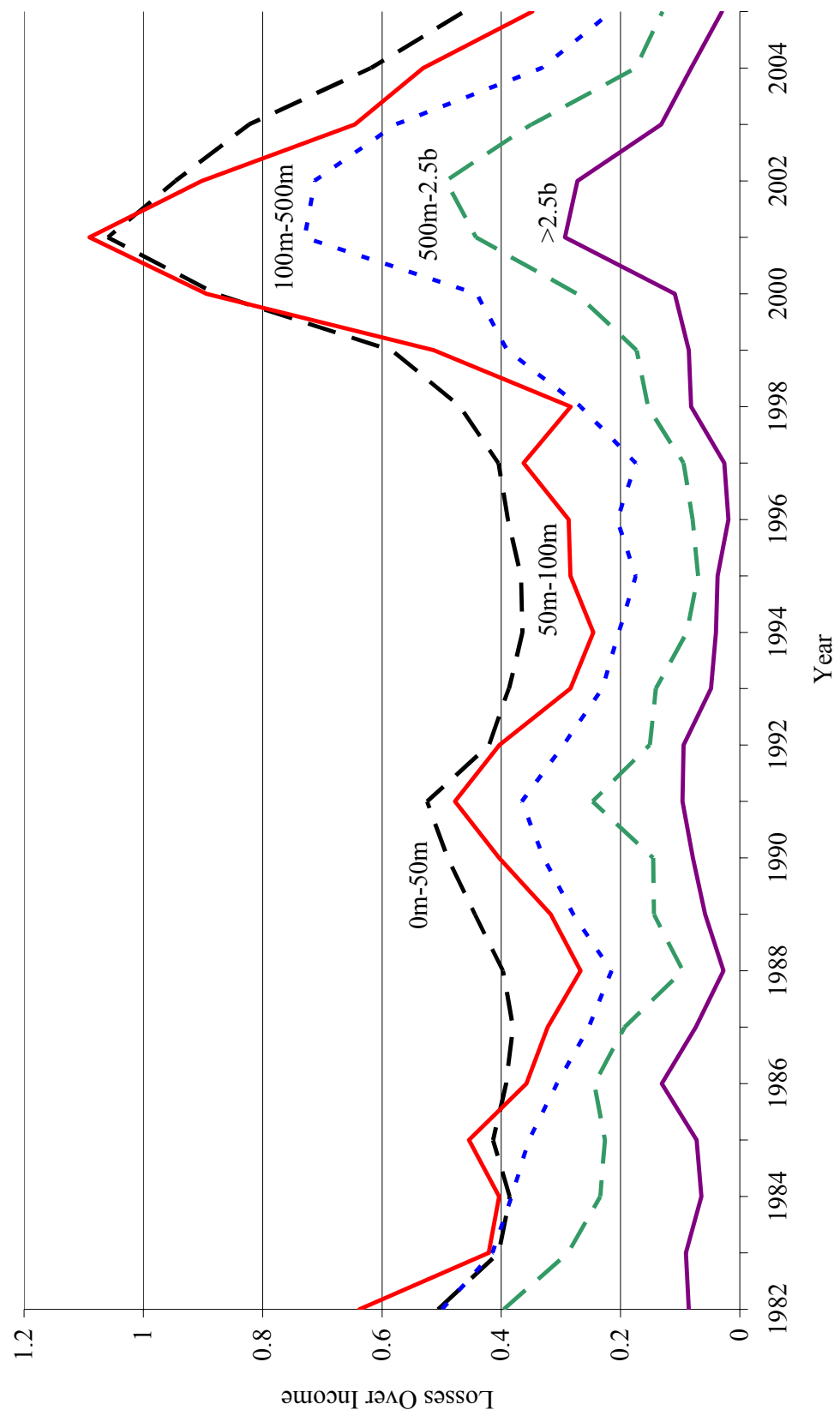
Figure 6. Losses by Firm Age
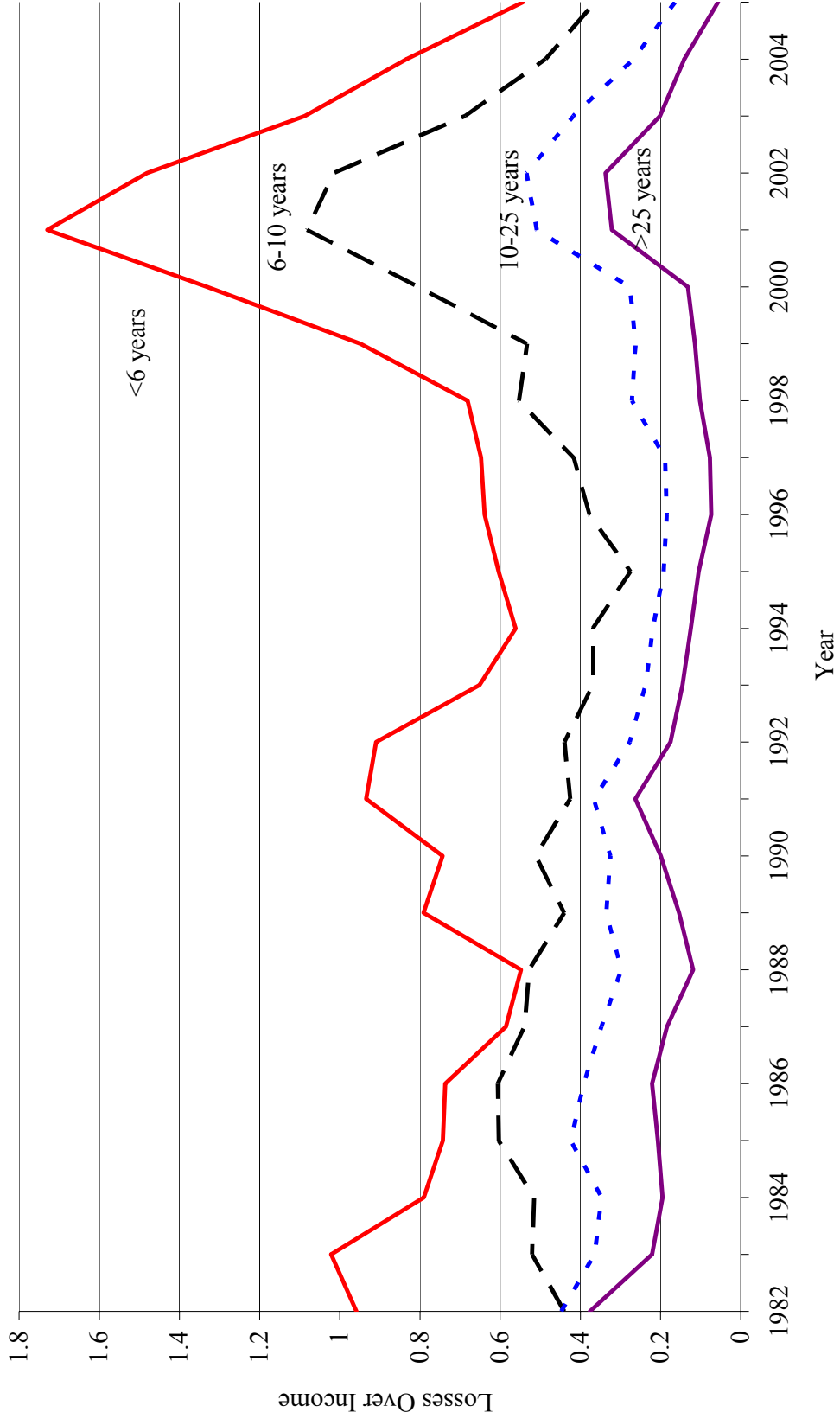
Figure 7. Losses with Constant Net Asset Shares
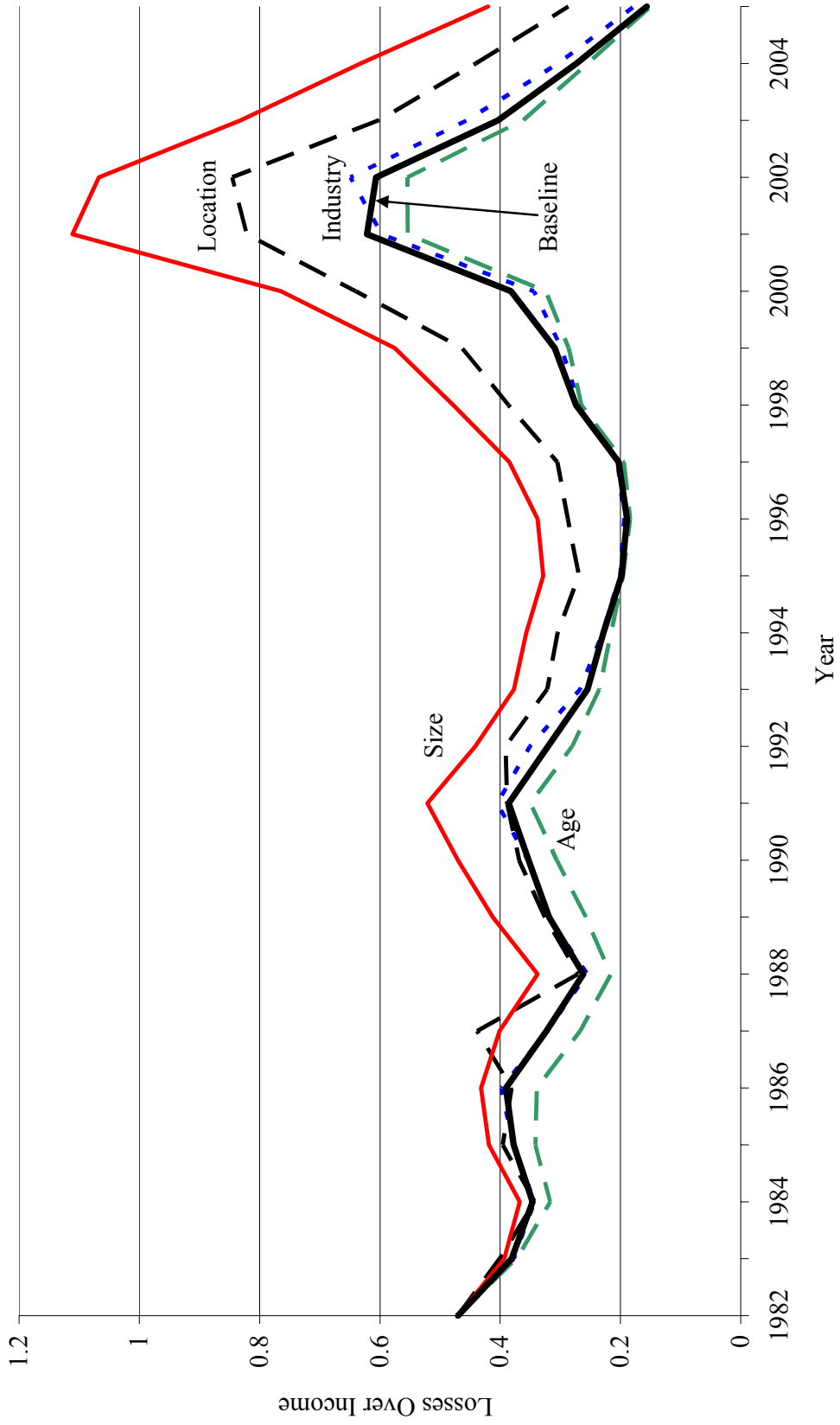
Figure 8. The Impact of Adjustments
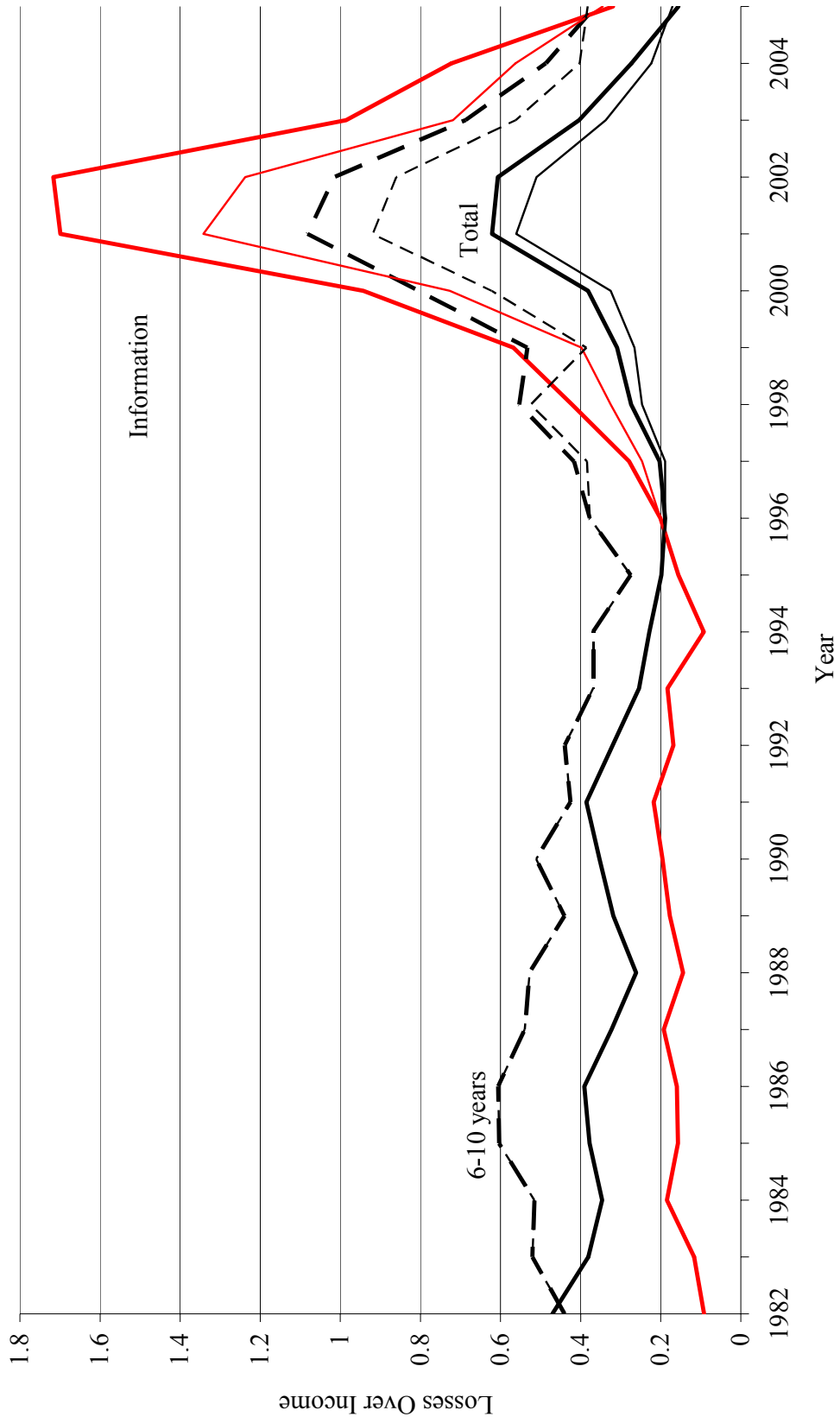
Figure 9. Mean Rate of Return on Assets, All C Corporations
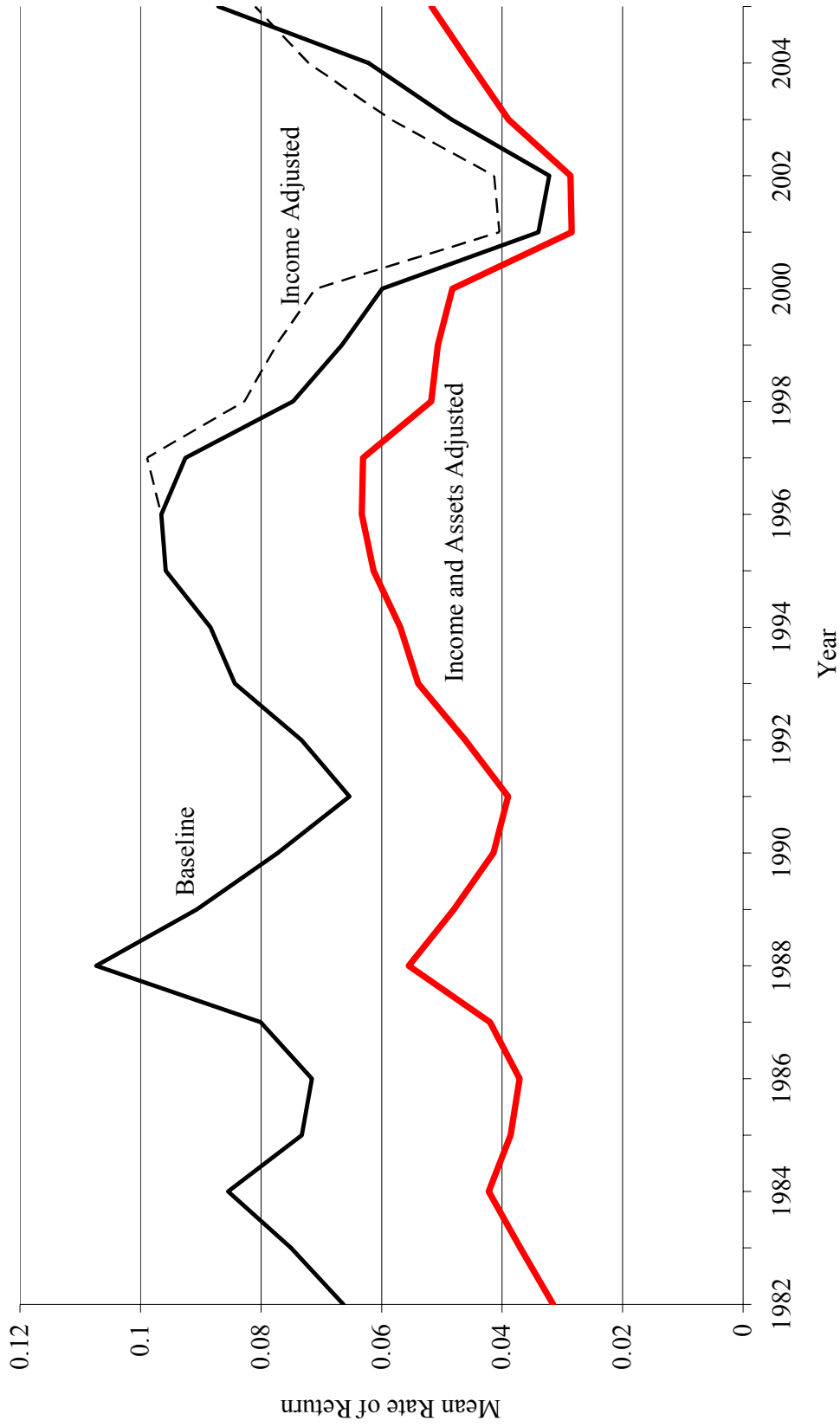
Figure 10. Mean Absolute Deviation, All C Corporations
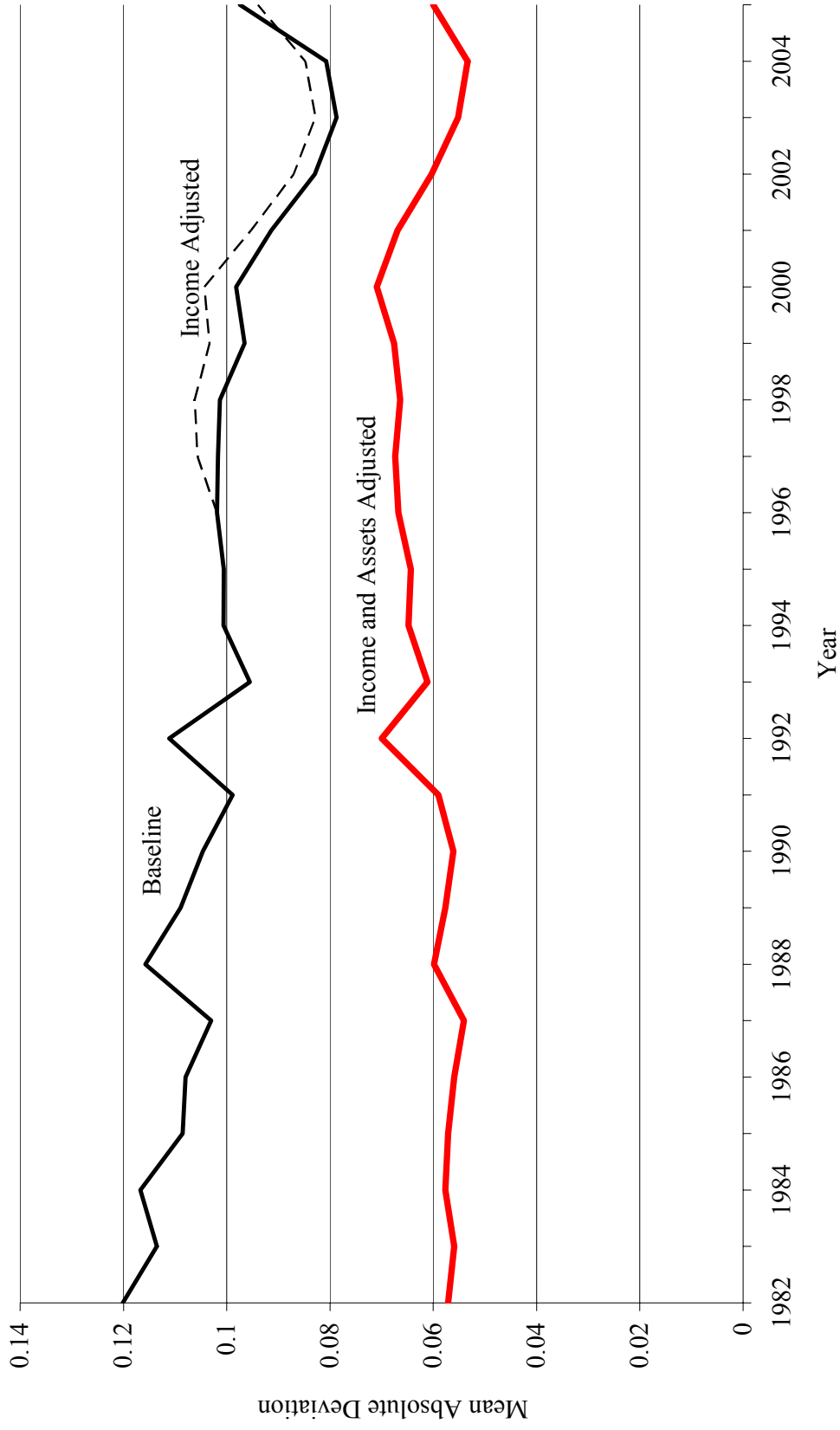
Figure 11. CCA, IVA, and Debt Gain Relative to Net Worth, NFCs
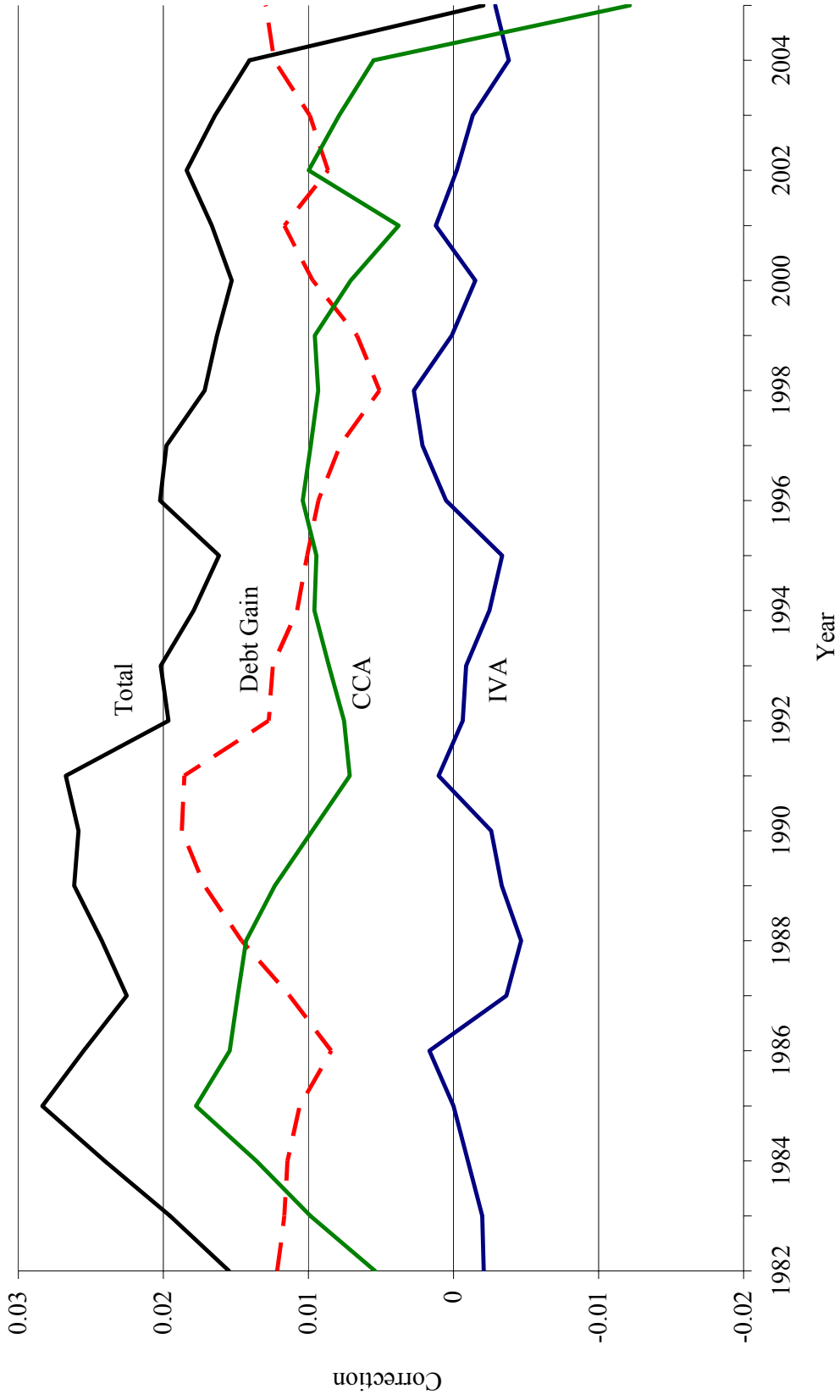
Notes: Debt Gain is the reduction in the real value of financial liabilities due to inflation.

CCA is the NIPA capital consumption adjustment.

IVA is the NIPA inventory valuation adjustment.

Figure 12. S Corporation Share of Net Corporate Income

Figure 13. Losses Over Income, S Corporations

Adjusted, using C Industry Weights

Unadjusted

Adjusted

Losses Over Income

Year
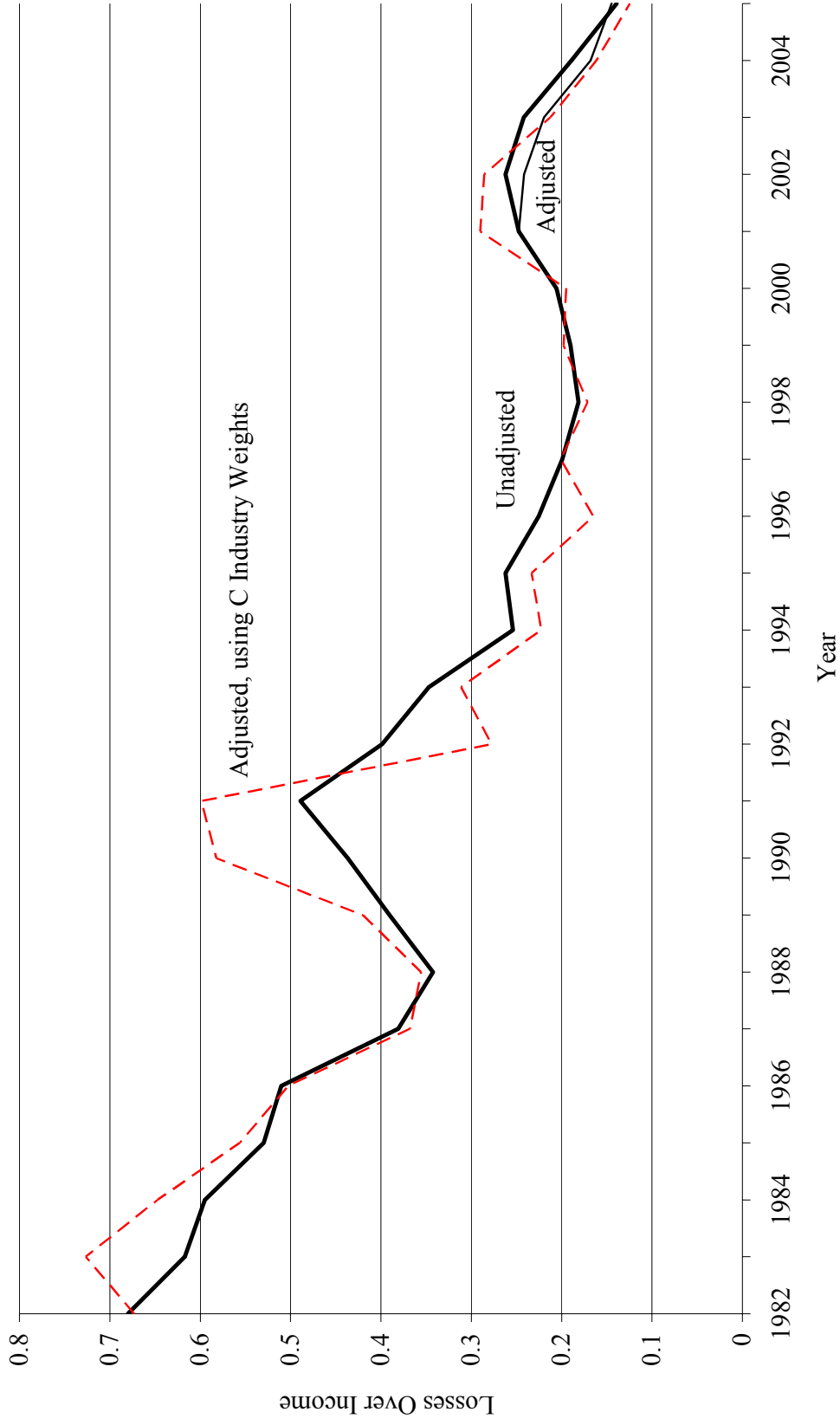
Figure 14. 2005 Asset Shares, C and S Corporations

C Corporation Shares
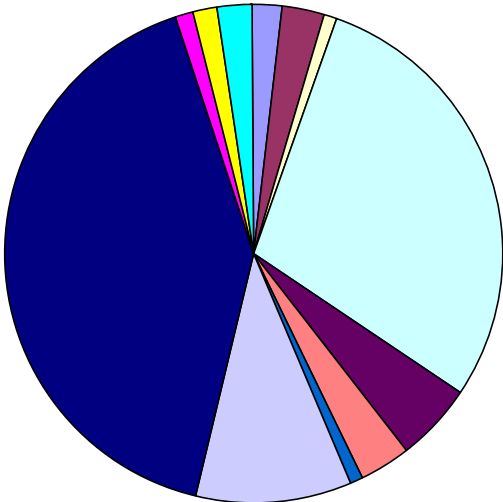
S Corporation Shares
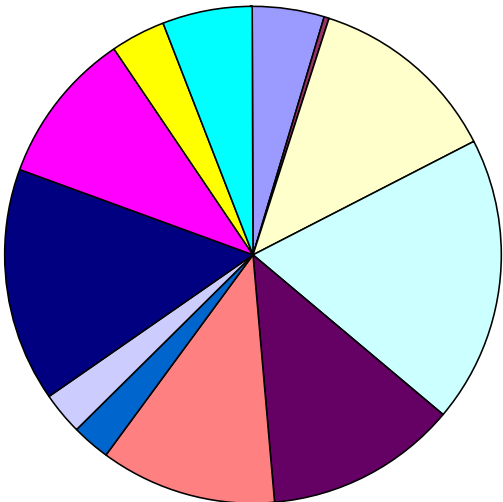
▫ Agriculture and Mining	▪ Utilities	▫ Construction	▫ Manufacturing
▪ Wholesale	▪ Retail	▪ Transportation	▫ Information
▪ Finance	▪ Real Estate	▪ Professional Services	▪ All Other Sevices

Figure 15. Mean and MAD, S Corporations (Adjusted)
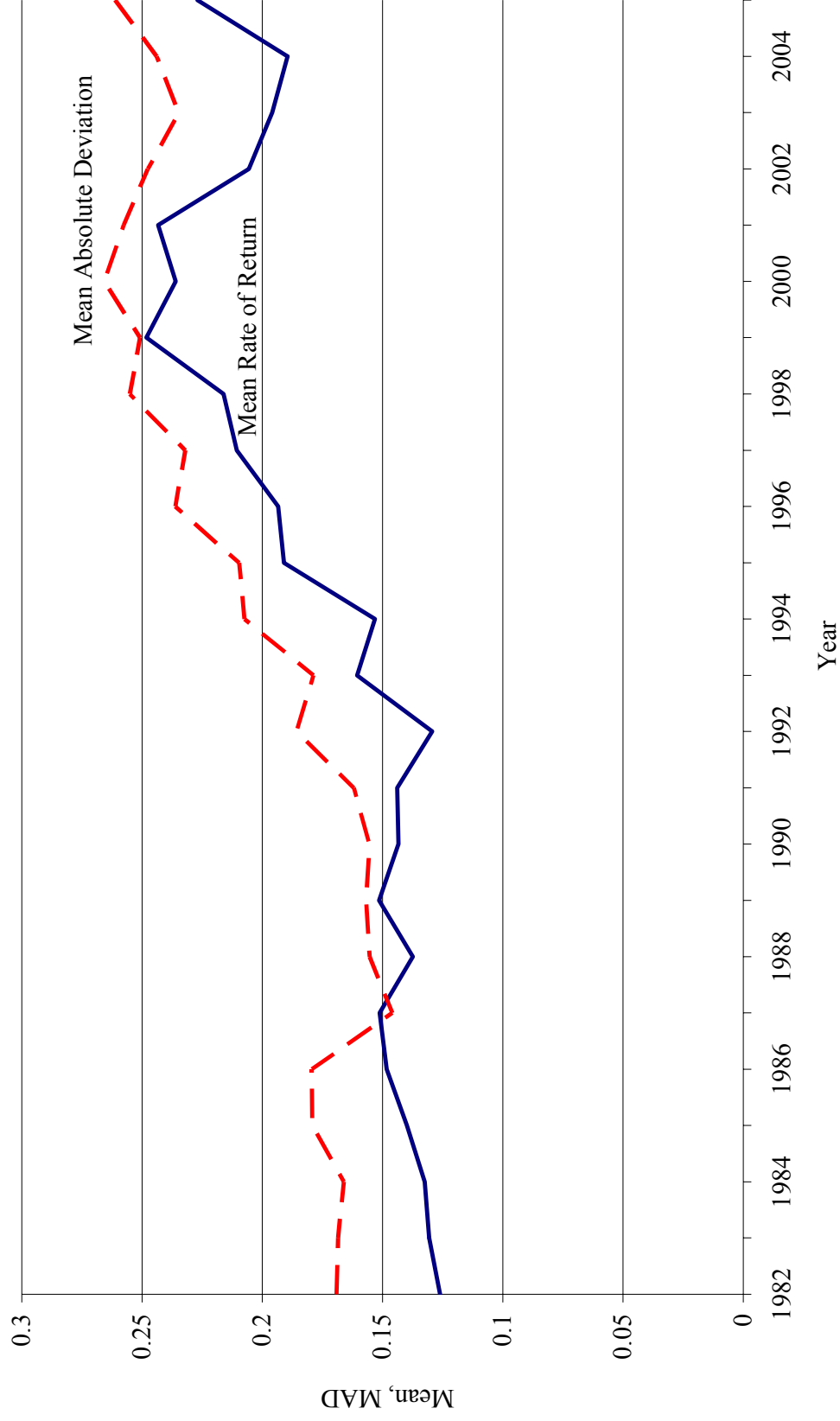
Figure 16. Losses Over Income, All Corporations (Adjusted)
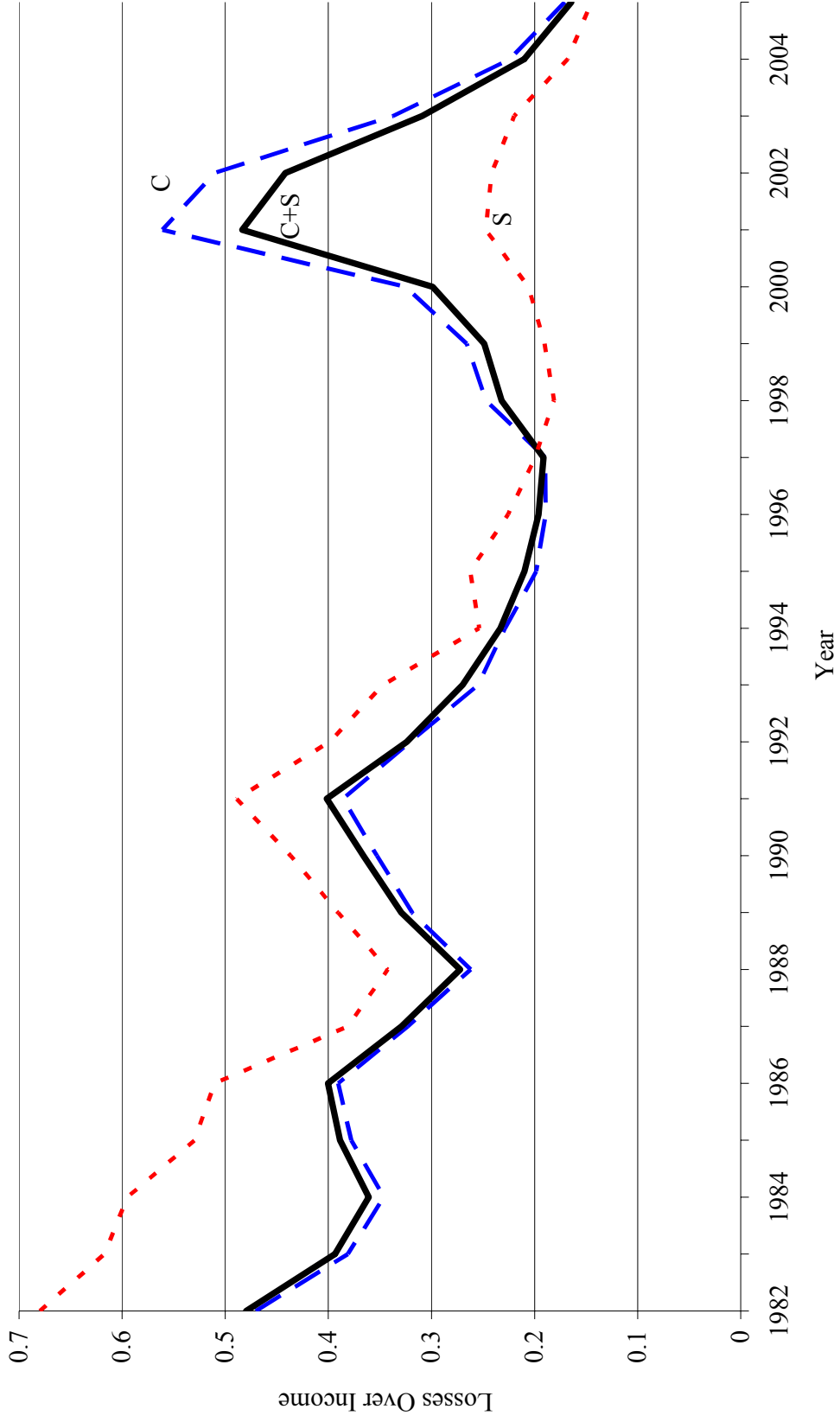
Figure 17. The Impact of Excluding Capital Gains
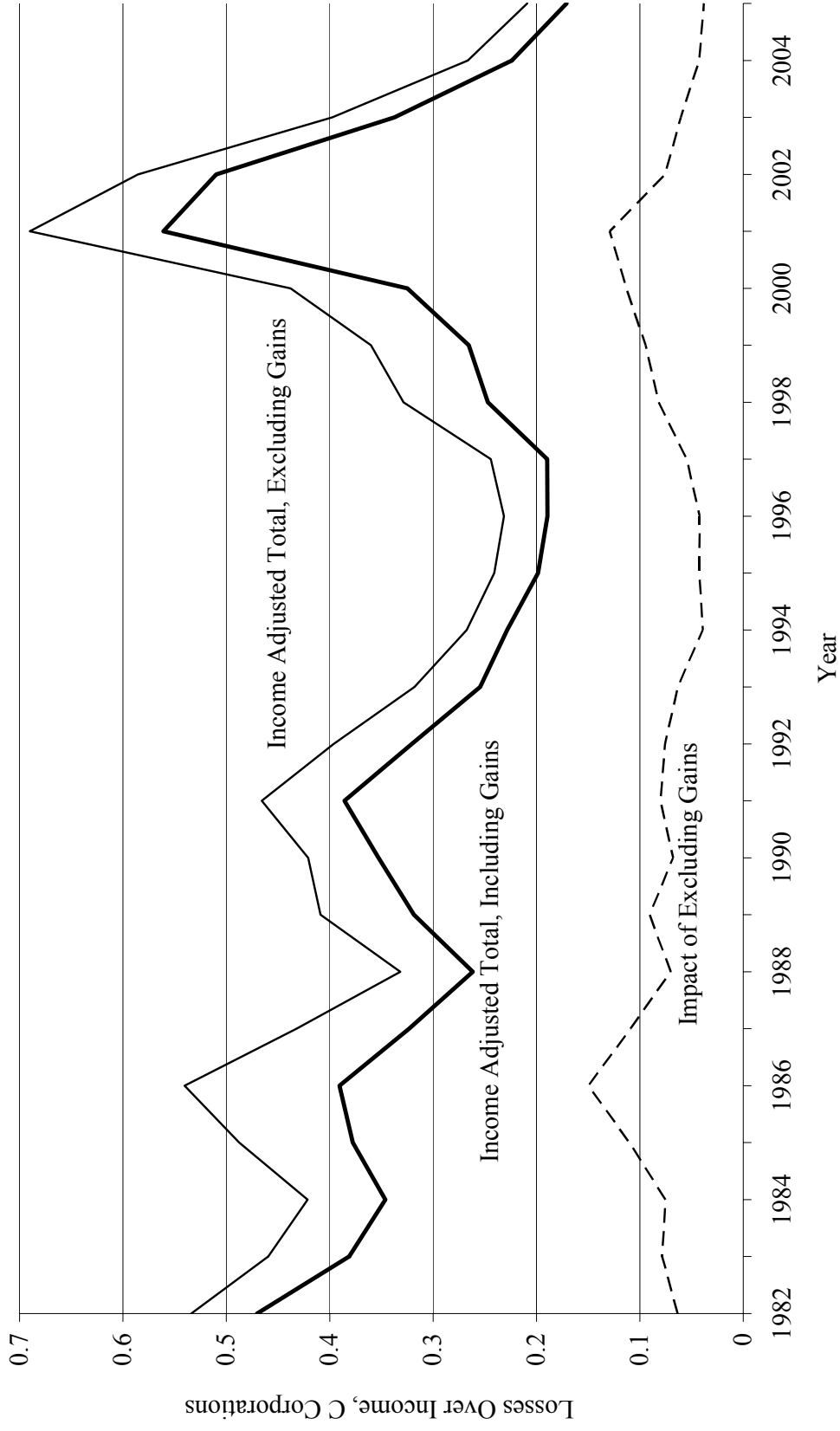
Figure 18. Losses Over Income, Nonfinancial C Corporations
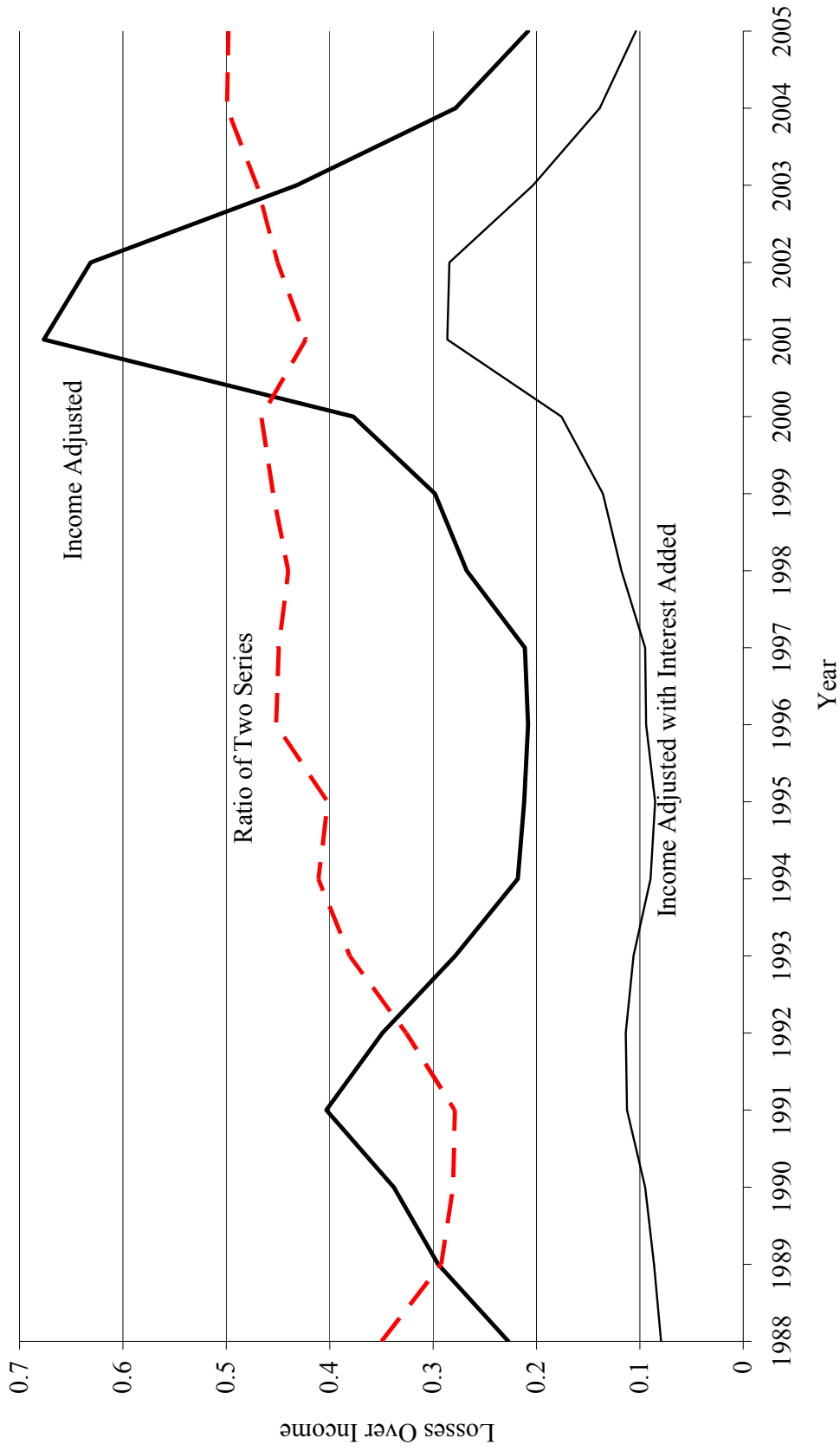
Figure A1. Losses/Income vs. Mean/MAD
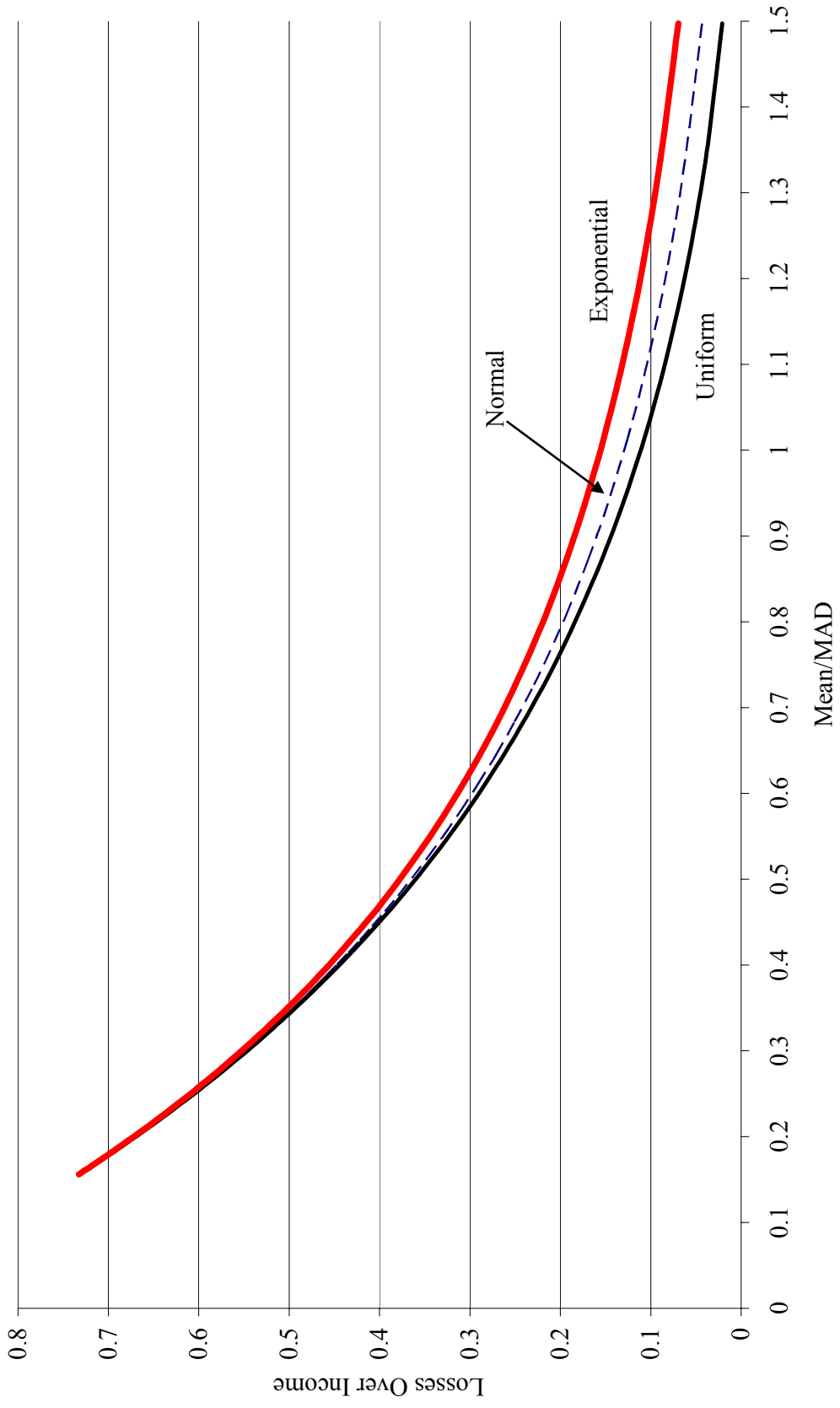
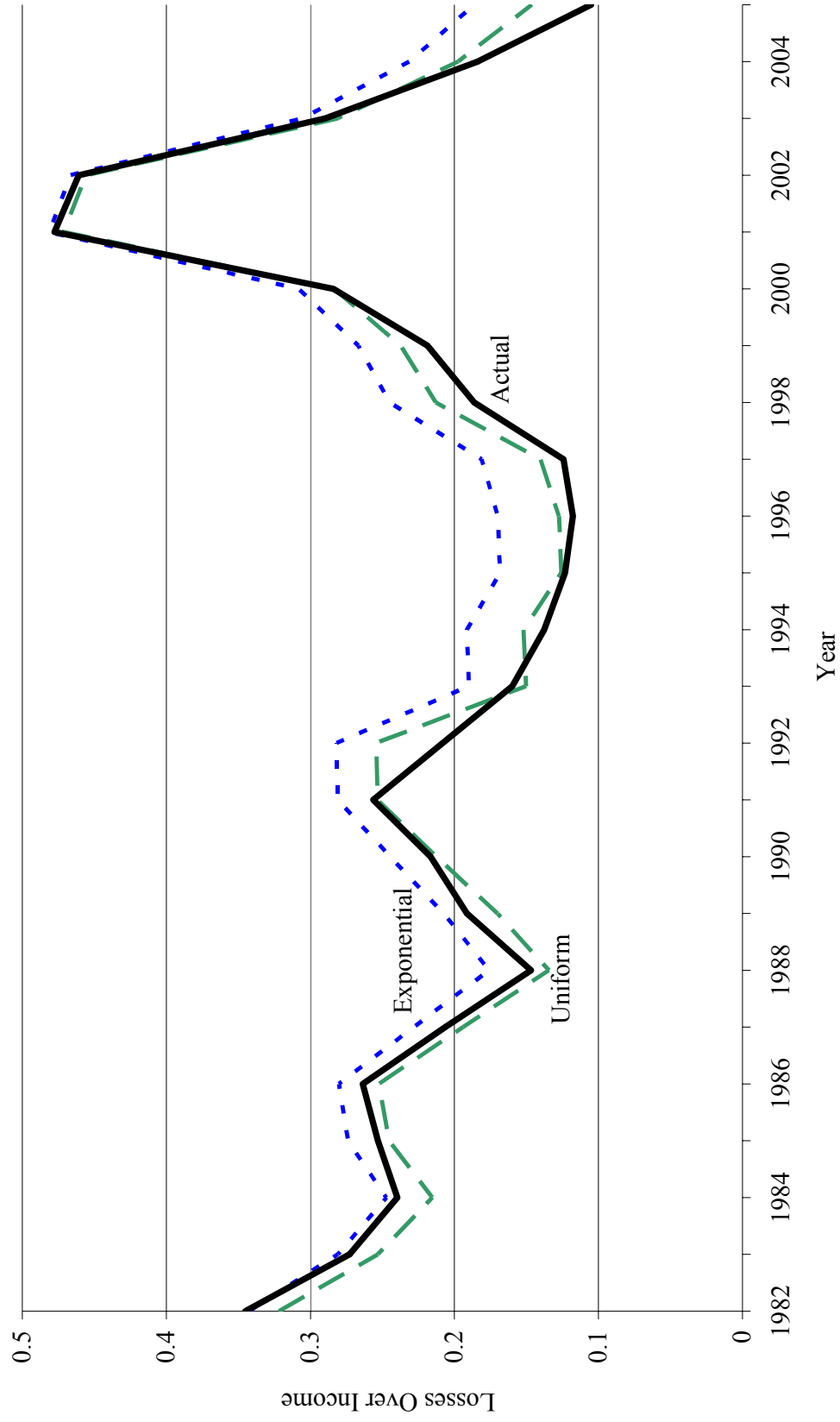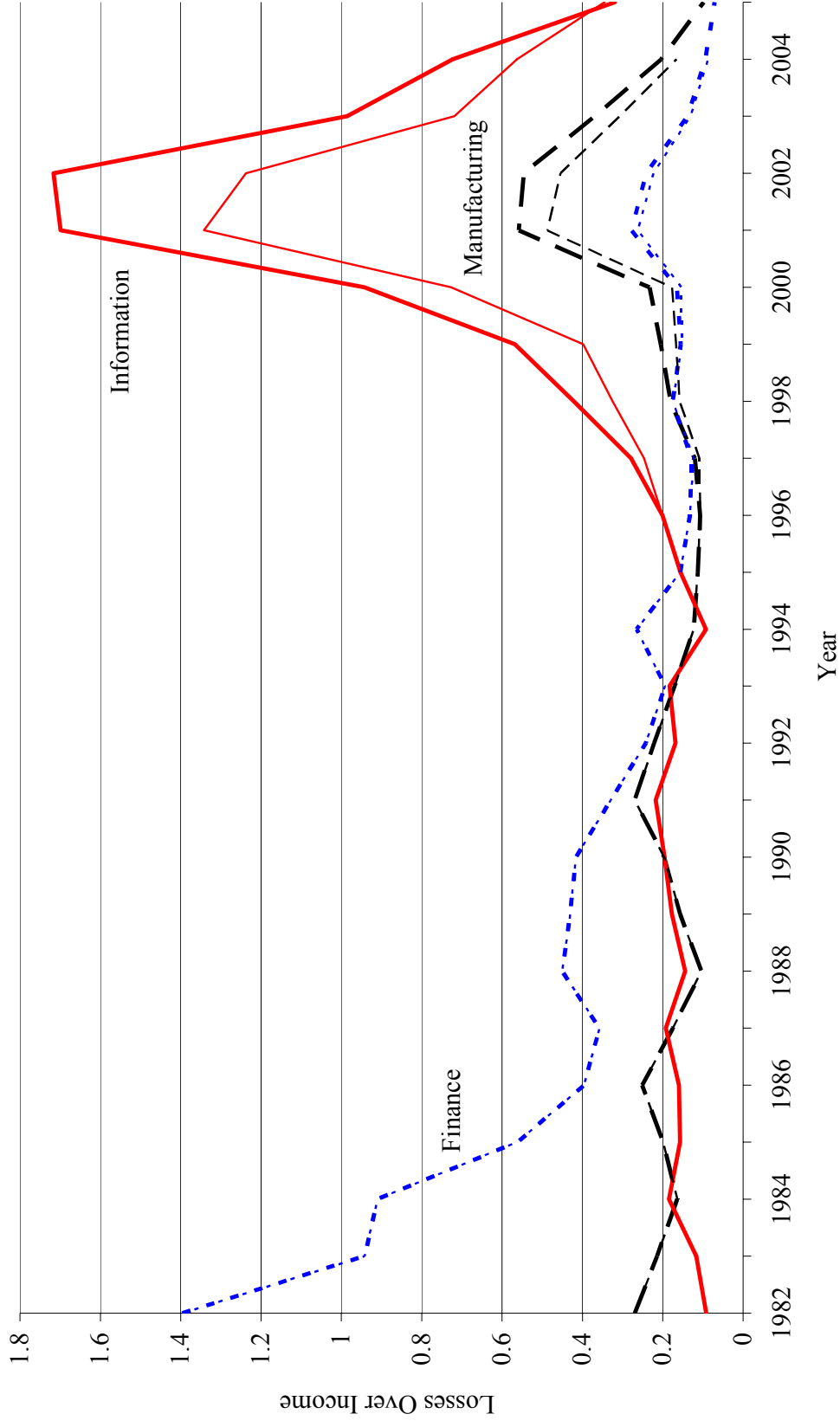Figure A2. Predicted and Actual L/I for C Corporations with Net Assets > 0

Figure A3. Losses by Industrial Composition: Impact of Income Adjustment

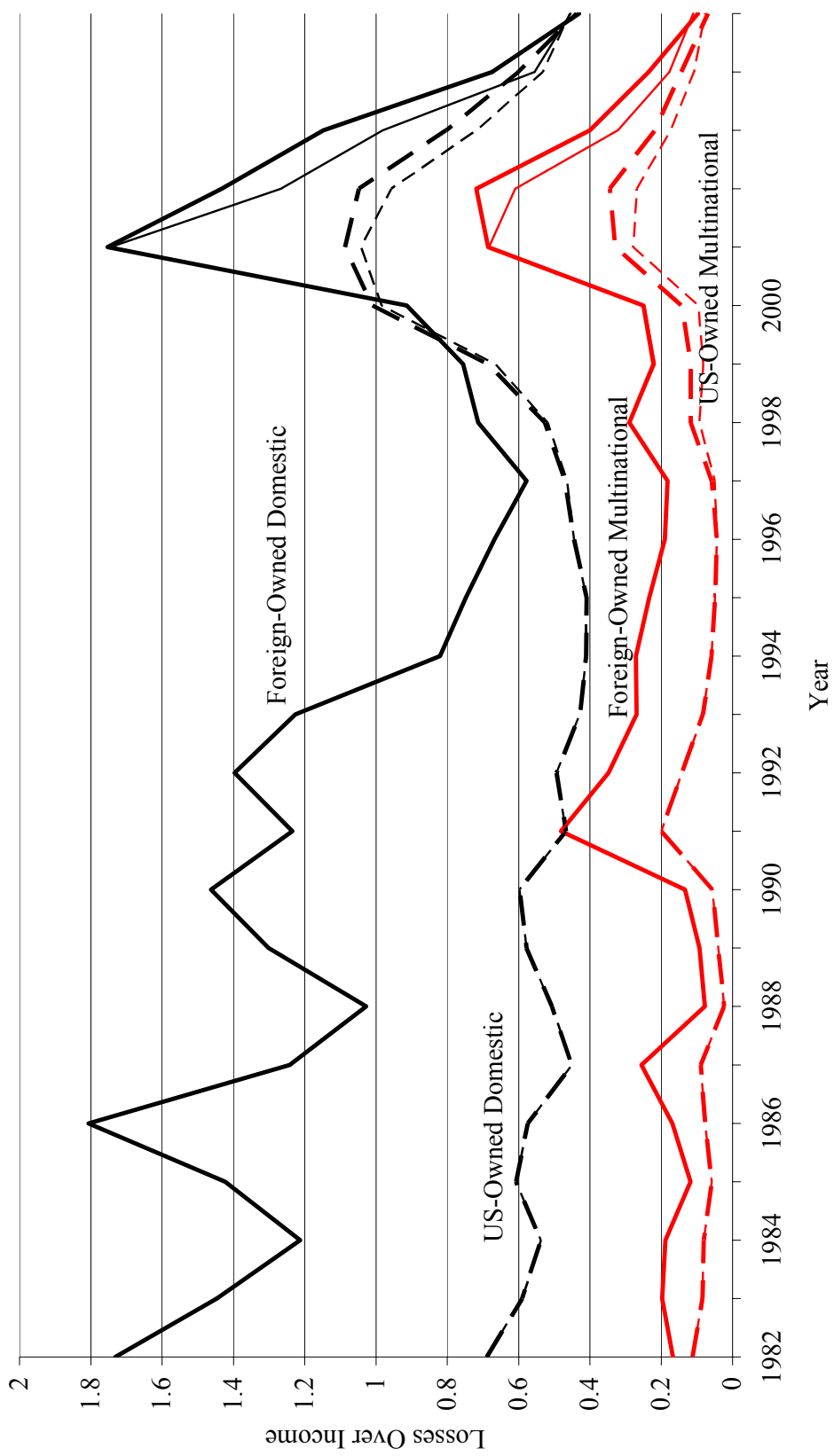**Figure A4. Losses among Multinationals and Domestic Firms: Impact of Income Adjustment**

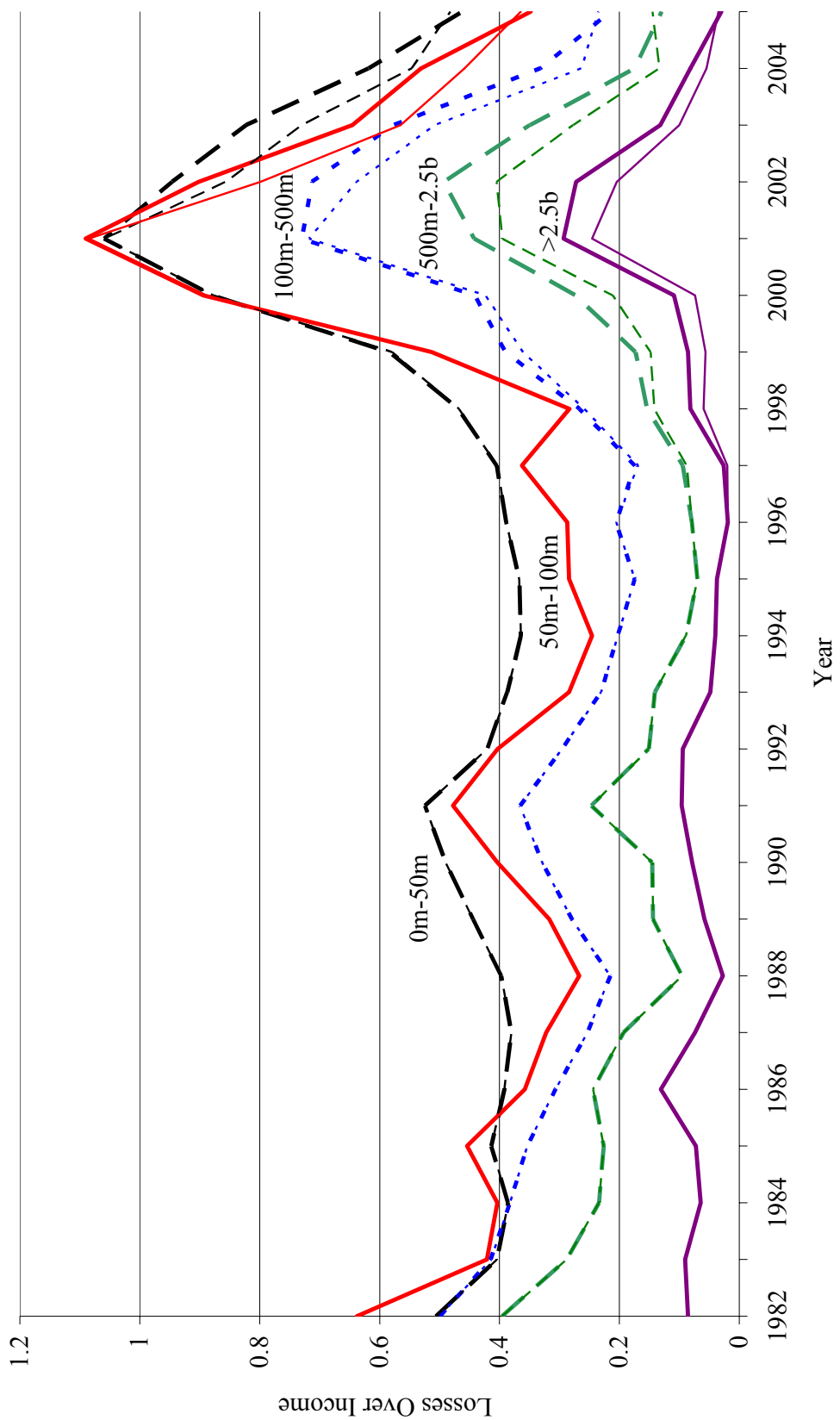Figure A5. Losses by Real Net Firm Assets: Impact of Income Adjustment

Figure A6. Losses by Firm Age: Impact of Income Adjustment