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Recent Revisions to Corporate Profits: What We Know and When We Knew It

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Initial estimates in the National Income and Product Accounts significantly overstated U.S. corporate profits for the 1998-2000 period. Subsequent revisions reveal that the profitability of the nation's corporate sector in the late 1990s was substantially weaker than "real-time" data indicated. An unexpected surge in employee stock options exercised—and perhaps, in some sectors, firms' inflated statements of profit—may help explain the large downward revisions.

Recently revised estimates of aggregate corporate profits show that U.S. corporations were far less profitable at the end of the 1990s than previously thought. Back in July 2000, the Bureau of Economic Analysis (BEA), in its *Survey of Current Business*, estimated that aggregate after-tax corporate profits had totaled $513.6 billion for 1998 and $567.1 billion for 1999. In July 2002, however, the BEA revised these numbers downward by $31 billion and $52.8 billion, respectively. Profits for 2000, too, were revised downward, from $574 billion to $523 billion. As of July 2002, the cumulative downward profit revisions for the years 1998, 1999, and 2000 totaled 11.0 percent, 9.3 percent, and 8.9 percent, respectively.

These large downward revisions raise significant questions about the U.S. economy's recent performance. Corporate profits provide the single best "bottom line" assessment of the current health and future prospects of the corporate sector. Indeed, corporate profits play a central role in determining the attractiveness of business expenditures on fixed capital, research and development, and employee development.

Profits also provide important information to capital markets. In equity markets, for example, information about profits helps investors forecast future dividends and determine the price they are willing to pay for equity. Similarly, in debt markets, profits determine a borrower's ability to repay the borrowed funds and thus the amount of credit that lenders are willing to extend.

Although the BEA is not the primary source of profit data for managers and markets, the magnitude of the BEA revisions nevertheless reveals how difficult it can be to obtain precise "real-time" measures of corporate profitability.

In this edition of *Current Issues*, we examine the magnitude and causes of the BEA's latest revisions to corporate profits in the National Income and Product Accounts (NIPA) for the 1998-2000 period. We find that these same revisions are among the largest of the past forty years. Although the revisions' origins are difficult to identify

precisely, we show that the unanticipated surge in the exercising of employee stock options over this period is a large part of the story. In some industries, this unexpected surge is large enough to explain the full extent of the revisions. In other industries, it is clear that other factors—including the widely publicized accounting scandals of recent years—played a partial role.

Measuring Corporate Profits: Conceptual and Practical Considerations

Conceptually, the definition of corporate profits is straightforward; converting this definition into practice, however, is not. The goal in the National Income and Product Accounts is to measure income generated by the *current production* of goods and services, and that requires a definition different from the one used in conventional financial accounting. For example, items such as capital gains are included as profits under conventional financial accounting, but because they do not represent income from currently produced goods and services, they are not included in the NIPA definition (Petrick 2001). We refer to the difference between NIPA profits and financial accounting profits as the "NIPA–financial gap."

To balance timeliness with accuracy, the BEA publishes a series of corporate profit estimates, then recalculates each successive estimate more accurately as more complete data become available. Financial statement data from the filings of large public corporations are generally available on a quarterly basis, but these same data are not available for the vast majority of small, privately owned corporations. Tax filings, by contrast, provide exhaustive coverage of *all* corporations and are a source of data not available from financial statements. The problem with tax filings, however, is timeliness: Initial data are not available to the BEA until about a year after a calendar year-end. Thus, before the tax filings become available, the BEA is forced to rely on a variety of publicly available sources to estimate corporate profits.[1]

On an annual basis, the BEA's July release includes an estimate of annual profits for the most recently completed calendar year—a release known as the "first July" estimate.[2] This estimate, based mainly on the financial statement data of publicly traded firms, is revised with lags of one and two years in what are known, respectively, as the "second July" and "third July" estimates. The second and third July estimates are based on tax filings with the Internal Revenue Service (IRS) and therefore reflect information on hundreds of thousands of additional firms that is not available for the first July estimates.

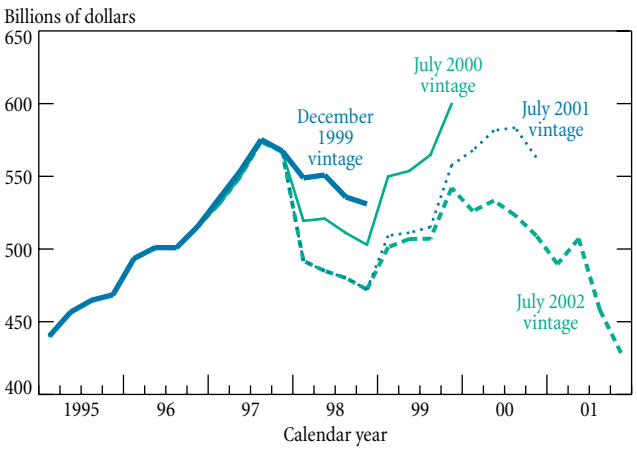
In addition, tax filings provide valuable information to the BEA even for publicly traded companies because the NIPA definition of profits is closer to the tax definition than to the financial definition. These annual July revisions to corporate profit estimates therefore reflect not only the larger number of firms sampled, but also *unexpected* changes in the definitional gap between financial profits and tax profits.

In addition to this regular schedule of initial and revised profit estimates, the BEA issues a set of *comprehensive* revisions about every five years. The comprehensive revisions include 1) definitional and classification changes, which allow for a more accurate depiction of the U.S. economy; 2) statistical changes, which use improved methodologies and incorporate better data; and 3) presentational changes, which incorporate the former two changes and render the tables more informative.

Recent Revisions to NIPA Corporate Profits

The recent pattern of downward revisions is obvious in plots of the corporate profit data. Chart 1 plots four successive "vintages," from 1999 to 2002, of quarterly after-tax corporate profits for the 1995-2001 period.[3] (Because of comprehensive revisions, the annual estimates for 1999 were released in December rather than July.) Each line, or vintage, represents the real-time perspective on the historical time series—in other words, it shows each time series as it would have appeared to an observer on that vintage date. According to the chart, the revisions were negative in each of the annual releases from 2000 to 2002. These data are reported in Panel A

Chart 1
Corporate Profits by Vintage
Quarterly Observations, Reported at an Annualized Rate



Source: U.S. Department of Commerce, Bureau of Economic Analysis.

Note: Corporate profits are reported after tax and without capital consumption adjustment (CCA) and inventory valuation adjustment (IVA).

of Table 1, where each column represents a data vintage and each row represents the calendar year for which the BEA was estimating profits.

To minimize the effect that definitional changes can have on levels, we also examine the impact of revisions on the estimated growth rate of profits. Panel B of Table 1 shows the decline in the BEA's estimates of annual growth in corporate profits implied by the revisions over the past few years. In the July data releases of 2000, 2001, and 2002, the revisions to growth rates in corporate profits for calendar years 1998, 1999, and 2000 were consistently negative. The December 1999 release indicated a -2.9 percent growth rate of corporate profits for 1998; this estimate was lowered to -7.5 percent in July 2000 and down still further to -13.1 percent in July 2001. Similarly, the original estimate of corporate profits growth for 1999 was 10.4 percent, but was subsequently lowered to 8.5 percent in July 2001 and down further to 6.6 percent in July 2002. Finally, the original estimate of year 2000 corporate profits growth, released in July 2001, was 9.7 percent, subsequently revised down to 1.7 percent in July 2002.

To put these revisions into historical perspective, we use data available from the Federal Reserve Bank of Philadelphia's real-time data set, which contains each vintage of data for aggregate after-tax corporate profits.[4] Chart 2 plots the total revision (that is, from the first July estimate to the third July estimate) to the one-year growth rates of NIPA corporate after-tax profits from 1966 to 2000. (The final bar shows only the revision implied by the second July estimate because the final revision for 2001 is not yet available.)

Table 1
Corporate Profits

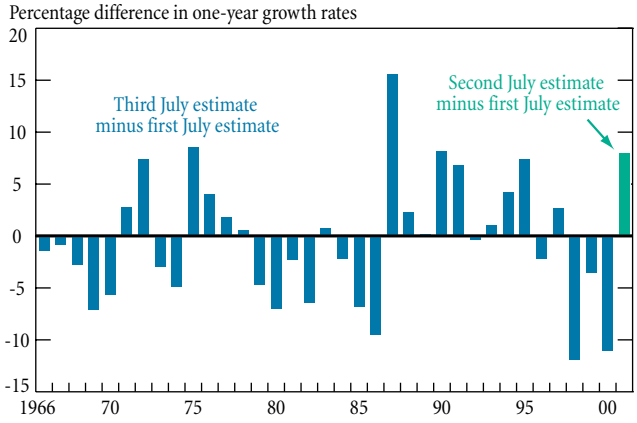
	Data Vintage				
	Dec 99[a]	Jul 00	Jul 01	Jul 02	Dec 03[a]
Panel A: Corporate Profits (Billions of Dollars, Nominal)					
1996	502.7	502.7	502.7	502.7	501.4
1997	557.6	555.2	555.2	555.2	552.1
1998	541.7	513.6	482.3	482.3	470.0
1999	—	567.1	523.3	514.3	517.2
2000	—	—	574.0	523.0	508.2
2001	—	—	—	470.9	495.6
2002	—	—	—	—	549.9
Panel B: Estimates of One-Year Growth Rates in Corporate Profits (Percent)					
1997	10.9	10.4	10.4	10.4	10.1
1998	-2.9	-7.5	-13.1	-13.1	-14.9
1999	—	10.4	8.5	6.6	10.0
2000	—	—	9.7	1.7	-1.7
2001	—	—	—	-10.0	-2.5
2002	—	—	—	—	11.0

Sources: U.S. Department of Commerce, Bureau of Economic Analysis; authors' calculations.

Note: Corporate profits are reported after tax and without capital consumption adjustment (CCA) and inventory valuation adjustment (IVA).

[a] There were no July revisions for 1999 or for 2003 because comprehensive revisions were released in these years.

Chart 2
Revision to One-Year Growth Rate of Annual Corporate Profits



Sources: Federal Reserve Bank of Philadelphia, real-time data set; authors' calculations.

Note: Corporate profits are reported after tax and without capital consumption adjustment (CCA) and inventory valuation adjustment (IVA).

The recent downward revisions to the *growth rate* of corporate profits are the largest in our historical sample (which begins in 1966) and represent a sharp departure from a recent trend of upward revisions. In the eleven years preceding 1998, the total revision to the one-year growth rate for profits was positive for nine years, averaging 4.1 percent. By contrast, the downward revisions of 12.0 percent and 11.4 percent for 1998 and 2000 represent the largest and second-largest negative revisions, respectively, to one-year growth rates in our sample.

Why Were the Recent Revisions So Large?

The revisions to corporate profits over the years 1998-2000 raise an obvious question: Why were they so unusually large and negative, especially given the long sequence of largely positive revisions that preceded them? Perhaps the financial corporate profit data used in the first July estimates have become a less reliable predictor of final NIPA data—in other words, perhaps the NIPA–financial gap widened unexpectedly. Two recent studies (Manzon and Plesko 2002; Mills, Newberry, and Trautman 2002) document a breakdown of

the historical relationship between financial accounting profits and NIPA profits.

Our calculations using annual data confirm their findings. We find that a rolling ten-year correlation between the growth rate of S&P 500 earnings (which reflect financial accounting profits) and NIPA profits ranged from 0.85 to 0.95 in the period from the 1950s through the 1980s. This correlation, however, fell throughout the 1990s to a low of about 0.35 for the decade. This result suggests that the data available for the BEA's first July estimate of corporate profits, which is based primarily on financial accounting profits, have become a less reliable predictor of the final estimate of NIPA profits.

What is causing this divergence between financial profits and the final NIPA numbers? We consider two possibilities. The first is an increased use of employee stock options. The expense associated with stock options can be accurately assessed by the BEA only at the time of the second- or third-round profit estimates. The second possible cause is the reported increase in "aggressive accounting"—accounting choices designed to artificially inflate profits—especially among publicly traded corporations whose management has an incentive to report to shareholders growing profit figures.

Do Recent Revisions Reflect an Unexpected Surge in Exercised Stock Options?

One reason for the widening NIPA-financial gap may be the rapid growth of employee stock options. When exercised, stock options are treated as an employee compensation expense, both in tax profits and in NIPA profits. However, stock options are generally not treated as an expense in financial profits. In addition, corporations disclose the value of options exercised on an annual basis, not on a typical quarterly filing schedule. Therefore, when the BEA calculates its first-round corporate profit figures, it must estimate the magnitude of stock options exercised. For the latter-round profit estimates, however, the BEA has access to firms' tax filings and can revise its first-round profit estimate to reflect the realized value of the stock options exercised.

The BEA itself suggests that recent revisions to NIPA profit estimates were caused in part by an unexpected surge in the value of stock options exercised by employees. Seskin and McCulla (2002, p. 25) of the BEA contend that "the large downward revisions to profits for 1999 and 2000 may reflect the fact that the employee stock options that many high-tech companies, such as Internet firms, began providing in the mid-1990s became fully vested, and the employees started to exercise their options." Consistent with this claim, estimates by Mills, Newberry, and Trautman (2002) indicate that employee stock options account for as much as half the difference between tax and financial income in the 1990s.

How much of the recent revisions to corporate profits can be attributed to the growth in exercised stock options? To answer this question, we estimate the growth of stock options exercised for the 1996-2001 period and ask 1) whether it is large enough to explain the extent of the revisions to aggregate corporate profits data and 2) whether it can account for the pattern of revisions across industries.

To construct aggregate and sector-level data on the exercised employee stock options, we segment the universe of firms in Standard and Poor's Compustat database by BEA sector. For each year in each sector, we sort firms by asset size and select enough of the largest firms (in descending order) to cover at least 40 percent of assets. We then examine the Securities and Exchange Commission (SEC) 10-K filings to determine the value of employee stock options exercised. We measure this value as the number of options exercised times the difference between the stock price and the exercise price. This measure corresponds to the BEA's definition of employee stock options exercised. Finally, to estimate the aggregate value of employee stock options exercised for each industry sector, we divide the aggregate estimate in our sample by the fraction of assets of the sector covered by our sample. This scaling assumes that the sample is representative of the sector in terms of employee stock options exercised as a fraction of firm assets.

Our findings, summarized in Table 2, indicate that the aggregate value of stock options exercised has swelled in recent years. The value exercised increased from $68.6 billion

Table 2
Employee Stock Options Exercised
Billions of Dollars

	Calendar Year			
Sector	1997	1998	1999	2000
Services	8.93	20.57	47.57	78.09
Communications	3.35	9.74	9.90	6.63
Durables	14.05	19.44	32.56	55.89
Finance, insurance, and real estate	23.08	22.23	22.61	24.50
Trade	3.98	4.94	5.14	7.92
Nondurables	12.70	21.13	19.82	21.88
Agriculture and mining	1.24	0.34	0.28	0.99
Utilities	0.86	0.88	0.72	0.69
Transportation	0.35	0.67	0.61	0.69
Construction	0.09	0.13	0.07	0.09
Total	68.61	100.08	139.29	197.37

Sources: Standard and Poor's Execucomp; authors' calculations.

in 1997 to $100.1 billion in 1998, to $139.3 billion in 1999, and to $197.4 billion in 2000, nearly tripling in three years. The two sectors that experienced the most significant increases in employee stock options exercised over the 1997-2000 period were durables (from $14 billion to $56 billion) and services (from $9 billion to $78 billion). If we assume that the two-year change in these stock options exercised is a reasonable approximation of the two-year "surprise" in stock options exercised, these data show that the biggest surprises from 1998 to 2000 came in services (up from $20 billion to $78 billion) and durable goods (up from $20 billion to $56 billion).

We then consider whether the sector-specific increases in stock options exercised can explain the pattern of profit revisions across sectors. First, we break out the corporate profit revisions by sector (Chart 3 and Table 3). Then, in Chart 4, we plot the revisions against option exercise for each sector, using the data in Table 3. As the chart shows, the two sectors with the largest changes in employee stock options exercised—durables and services—experienced similarly large downward revisions to profits. This result is consistent with the view that unanticipated increases in the exercise of employee stock options have contributed significantly to profit revisions.

One exception to this finding, however, is the communications sector. This sector had the second-largest downward revision to profits despite a slight *decline* in employee stock options exercised. So although we conclude that the unexpected rise in employee stock options exercised can explain most of the profit revision, it is obvious that in some industries other factors were at work.

Table 3

Aggregate Changes in Employee Stock Options Exercised and Aggregate Corporate Profit Revisions, 1999-2000

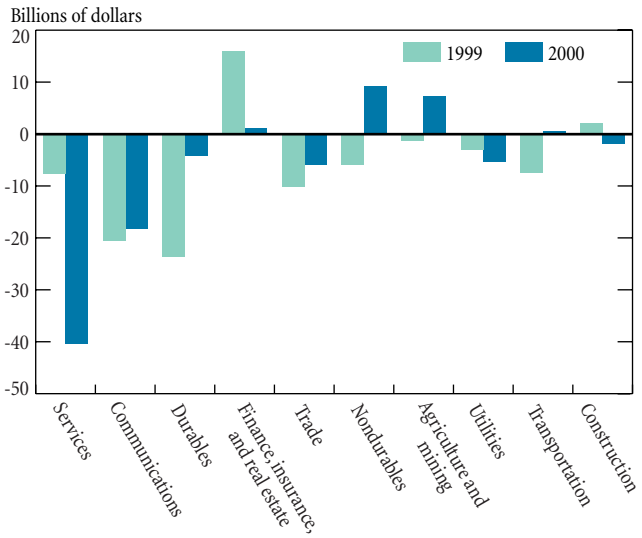
Billions of Dollars

Sector	Revisions to Corporate Profits	Changes in Employee Stock Options Exercised
Services	-47.8	57.52
Communications	-38.8	-3.11
Durables	-27.7	36.46
Finance, insurance, and real estate	16.9	2.27
Trade	-16.0	2.97
Nondurables	3.2	0.75
Agriculture and mining	6.0	0.64
Utilities	-8.3	-0.19
Transportation	-6.9	0.02
Construction	0.3	-0.04
Total	-119.14	97.29

Sources: U.S. Department of Commerce, Bureau of Economic Analysis; Standard and Poor's Execucomp; authors' calculations.

Chart 3

Revisions to Corporate Profits for Calendar Years 1999 and 2000



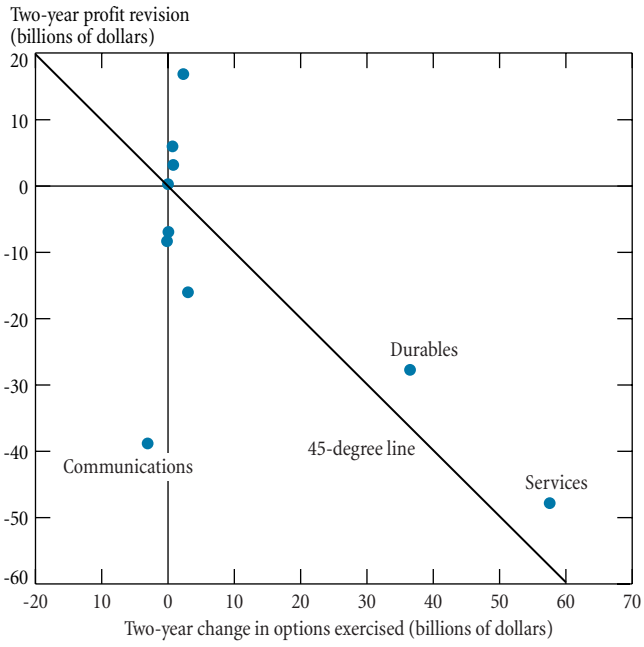
Sources: U.S. Department of Commerce, Bureau of Economic Analysis; authors' calculations.

Note: Corporate profits are reported after tax and without capital consumption adjustment (CCA) and inventory valuation adjustment (IVA).

Chart 4

Profit Revisions versus Change in Options Exercised, by Sector

1999-2000



Sources: U.S. Department of Commerce, Bureau of Economic Analysis; Standard and Poor's Execucomp; authors' calculations.

Do Recent Revisions Reflect More Aggressive Accounting?

Anecdotal evidence in the form of highly publicized accounting scandals and earnings restatements suggests that during 1999 and 2000, financial accounting for profits may have become more aggressive, leading to inflated statements of corporate profits. Earnings restatements must be filed with the SEC if companies find that they have significantly misreported their profits. Studies by the U.S. General Accounting Office (2002) and Moriarty and Livingston (2001) find that the total number of financial accounting restatements increased dramatically in the latter half of the 1990s. The evidence presented in these two studies suggests that corporations over this period were increasingly aggressive in their financial accounting statements, especially in recognizing revenues earlier than allowed by generally accepted accounting principles.

Is it possible that the deteriorating quality of the financial accounting data used to construct the preliminary estimates is responsible for recent profit revisions? Aggressive accounting per se does not necessarily result in profit revisions if firms overstate financial profits and tax profits by similar amounts. But suppose firms overstated profits on the financial statements the BEA used to construct the first July estimates. If those firms also filed amended tax returns before the third July estimates, then the restated profits data would lead to a revision of NIPA profits.

This explanation is theoretically possible, but the magnitude of the accounting restatements is large enough to explain only a modest portion of the recent NIPA profit revisions. We collected data on earnings restatements from SEC filings (8-K, 10-K, and 10-Q filings) and press reports dating back to 1999. These data reveal that restatements in the communications industry over the 1999-2000 period totaled less than $5 billion. The actual impact is smaller still because restatements cause profit revisions only to the extent that the restated earnings numbers subsequently appear on amended tax returns. Thus, even in the communications industry, where accounting scandals were highly publicized, the direct distortion due to earnings restatements obviously falls far short of the $38.8 billion NIPA revision reported in Table 3.

There are other possible causes for the profit revisions in the communications industry. In the first July estimates, extrapolations from data from publicly traded corporations are used to estimate profits for private corporations. In the late 1990s, the communications industry witnessed the entry of a large number of new firms that were, on the whole, unprofitable (see, for example, Brookings Institution [2002]). Since most of these new entrants were private companies, the extent of their financial losses was not known until their tax returns became available.[5] In addition, if publicly traded corporations were overstating profits more aggressively than privately held firms over this period, then subsequent use of tax data on private companies in place of these extrapolations would lead to additional downward revisions in the third July estimate.

Consider how this last factor might affect the calculation of profits in the communications industry. It now appears that WorldCom and Qwest overstated earnings for 1999 and 2000 by roughly $4 billion. Assuming that these two companies account for roughly 10 percent of profits for publicly traded firms in the industry, their earnings overstatements would imply $40 billion in overstatements by publicly held firms.[6] If this magnitude of overstated profits was extrapolated to *privately* held firms, and if private firms were 20 percent of industry profits (a high estimate), then this would cause the BEA to overstate private sector profits by $10 billion. This figure would be corrected in the final BEA calculations, based on IRS data, and would therefore cause a downward revision of $10 billion. Accordingly, even in this worst-case scenario, the magnitude of the accounting restatements is still not large enough to account for the $38.8 billion in revisions reported for the communications industry (Table 3).

A final possibility is that, during 1999 and 2000, firms increasingly reported to shareholders income that was sheltered for tax purposes. Desai (2002) infers the growth of tax shelters by adjusting for all other observable discrepancies between financial profits and tax profits, including the exercise of employee stock options. He concludes that the use of tax shelters has grown substantially in recent years. This explanation is consistent with the timing of recent profit revisions: Initial profit estimates, based on financial statements, were revised when the tax-based data became available. Without access to firms' confidential tax filings, however, the magnitude of this effect cannot be estimated reliably.

Conclusion

We have shown that revisions to corporate profits for the 1998-2000 period were unusually large and negative. The size of these revisions suggests that real-time data may have led markets and policymakers into thinking that corporate profitability was higher than subsequent data have revealed it to be. To the extent that corporate profitability helps determine stock prices and corporate investment, the overstatement of profits may have caused investors and corporate managers to misallocate funds over this period.

Reviewing possible explanations for these revisions, we conclude that, for some industries, the unexpected surge in the value of stock options exercised during 1999 and 2000 played the major role. In other industries, notably communications, the evidence suggests that increasingly aggressive accounting, though harder to quantify, may have been a contributing factor.

We also conclude that the growth of stock options and aggressive accounting during the last half of the 1990s made it increasingly difficult for the BEA to calculate preliminary profit estimates. These problems seem to mirror those faced by markets and policymakers during the same period, underscoring the importance of recent reforms aimed at improving the measurement of corporate profits.[7]

Notes

1. Petrick (2002) provides a detailed breakdown of estimate sources. For year 2000 data, the sources were the U.S. Census Bureau's Quarterly Financial Reports on Manufacturing, Wholesale and Retail; Securities and Exchange Commission (SEC) filings of public corporations; required filings for firms in various regulated industries; and a range of miscellaneous sources.

2. On a quarterly basis, the BEA also releases preliminary estimates of corporate profits, then releases revised estimates one month later.

3. Owing to the availability of historical data, we focus on revisions to after-tax profits without adjustments to inventory valuation and capital consumption. Adjustments to those two items (which reconcile the different treatment of gains or losses on inventories and depreciation) have little impact on the relative sizes of revisions for most years.

4. For more information on the Federal Reserve Bank of Philadelphia's real-time data set, go to <http://www.phil.frb.org/econ/forecast/reaindex.html>.

5. We thank Ken Petrick of the BEA for suggesting a link between the losses of the privately held communications firms and the downward revisions of profits.

6. In 2002, based on SEC filings, WorldCom and Qwest restated earnings down by $3.1 billion and $0.8 billion, respectively, for the 1999-2000 period. To obtain an estimate of $40 billion in overstatements at the industry level, we use the fact that, during this period, those two companies accounted for roughly 10 percent of profits for publicly traded firms in the industry. We also require an estimate of the extent to which firms that have not publicly restated earnings may have nevertheless been overreporting. To illustrate a scenario in which the magnitude of this bias is large, we assume that all publicly traded firms in the communications industry were overstating earnings by proportional amounts.

7. The BEA has recently improved its adjustment for exercised stock options. See Moylan and Robinson (2003, p. 24).

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