The Statistical Discrepancy

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The Statistical Discrepancy

The Bureau of Economic Analysis (BEA) features two measures of aggregate economic activity in the U.S. economy, gross domestic product (GDP) and gross domestic income (GDI). GDP measures activity as the sum of all final expenditures in the economy plus change in private inventories, and is detailed in the product side of the national income and product account. GDI measures the sum of all incomes generated in production, and is detailed in the income side of the national income and product account.[1]

GDP and GDI in principle give the same measure of economic activity but, because all of the transactions underlying them are not recorded, are different in practice; different and incomplete data sources underlie the estimates of the two measures. BEA uses a variety of surveys, censuses, and administrative records—all of which are imperfect—to compute the estimates. The GDP estimates (and most of GDI) are typically revised two times following the first estimates published after the end of each quarter, and are revised in each of the following three years as annual data become available to improve the estimates.[2] About every five years, BEA publishes comprehensive "benchmark" revisions that incorporate information from quinquennial economic censuses and other source data, use revised statistical methodologies, and include definitional changes that adapt the national income and product accounts to a changing economy.

Even after comprehensive benchmark revisions, the estimates of GDP and GDI are typically different. The difference is the statistical discrepancy. It is the net sum of the measurement errors in the components of both GDP and GDI (any errors that affect GDP and GDI identically offset one another). The differences are not just due to shortcomings in the source data. In addition, seasonal adjustments for the components of the two aggregates are not made in lock step and introduce differences. Further, different interpolation and extrapolation techniques produce differences. The use of annual-frequency data in most of this study eliminates differences due to seasonal adjustments, and mitigates the differences due to interpolation and extrapolation techniques. The sample period used, 1970-2004, means that all but the last two years' estimates have been through at least one comprehensive benchmark revision, and the estimates through 1997 are either for years for which quinquennial input-output estimates are available as benchmarks, or are interpolations between those years.

Both GDP and GDI are the sums of their respective components. At a rough level of disaggregation, GDP is made up of 7 major components—personal consumption expenditures (PCE), fixed nonresidential investment, residential investment, change in

[1] BEA also produces estimates of the sum of gross products by industry, and the sum of gross state products. These are controlled to current-dollar GDP, however, and do not provide independent estimates of aggregate economic activity. BEA also produces gross national product and gross national income, which differ from GDP and GDI by the net factor incomes from the rest of the world—profits, interest, and compensation—and also do not provide independent estimates of aggregate economic activity.

[2] In addition, a revised estimate of GDI, based on the quarterly census of employment and wages, is published at the time that the preliminary estimate of GDP for the next quarter is released.

private inventories, exports, imports, and government consumptions expenditures and gross investment. At a similar level of disaggregation, GDI is made up of 10 major components—compensation of employees, taxes on production and imports, subsidies, net interest and miscellaneous payments (domestic), business current transfer payments (net), proprietors' income with inventory valuation and capital consumption adjustments, rental income of persons with capital consumption adjustment, corporate profits with inventory valuation and capital consumption adjustments (domestic industries), current surplus of government enterprises, and consumption of fixed capital. By convention, the statistical discrepancy is equal to GDP less GDI; this convention reflects the belief of BEA that the source data underlying the GDP estimates are generally more reliable than those underlying the GDI estimates. The estimates of GDP and GDI are composed of estimates made at much finer levels of detail than those described here.

The identity for the statistical discrepancy is thus the sum of all of the product-side components less the sum of all of the income-side components. At the level described here, and ignoring time-subscripts, the identity is:

$$SD = \sum_{i=1}^{7} GDP_i - \sum_{j=1}^{10} GDI_j$$

Where SD is the statistical discrepancy
GDP_i is the ith component of GDP
GDI_j is the jth component of GDI

Each component of GDP is equal to the true value of the component plus a measurement error:

$$GDP_i = gdp_i + e_i$$

Where gdp_i is the true (unknown) value of the ith component, and
e_i is the measurement error of the ith component

And similarly for the estimated components of GDI, gdi_j+u_j.

If all components of GDP and GDI were measured with perfect accuracy, there would be no statistical discrepancy. Because they are not, the statistical discrepancy is the sum of the error terms for the product and income side components:

$$SD = \sum_{i=1}^{7} e_i - \sum_{j=1}^{10} u_j$$

One study, by Klein and Makino (2000) explained deviations from trends for the statistical discrepancy using deviations from trend for income and product side components as explanatory variables. They had good success explaining the discrepancy's ratio to either GDP or its trend in the period 1947Q1 to 1997Q4 using

corporate profits, proprietors' income, exports, and government expenditures as explanatory variables. The study, however, now holds few lessons for contemporary national income and product account (NIPA) estimates. Their five-decade sample period is so long that data sources, methodologies, and even definitions changed considerably over the period.[3] A redo of Klein and Makino by BEA, using the same functional form and variables, and the same vintage of estimates, found that the study's findings also worked well for a shorter sample period, 1978-94. A later BEA redo, however, using data that had been changed in the 1999 and 2003 comprehensive benchmark NIPA revisions, discovered that the study's results were vitiated.[4] The improvements introduced in the comprehensive benchmark revisions eliminated the relationships that Klein and Makino had found. The appendix contains a further discussion of the comprehensive benchmark revisions and their effects on the discrepancy,

A sample period of 1970-2004 is used in this study because it covers both the period in the 1970s with increasing, then high inflation, followed by a period when inflation returned to rates generally below 4 percent. As discussed below, the most interesting results are for the period beginning in 1984, following the return to lower inflation.

Most studies of GDP and GDI volatility and revisions have used percent-change formulations to measure them because this formulation eliminates the complications that arise because activity has grown strongly over time.[5] This formulation cannot be used with the statistical discrepancy, however, because it has both positive and negative values in the sample period, and percent changes are not always meaningful.

An alternative formulation makes the current-dollar values of the statistical discrepancy a linear function of GDP, GDI, or their components.[6] This implies that measurement errors are in proportion to the sizes of the levels of the economic activity measures. An initial experiment regresses the levels of the discrepancy on a constant term and the levels of individual income and product side components. The results for 1970-2004 are summarized in the first three columns of table 1. GDP and 12 components—some overlapping to show additional detail for selected components—are used as explanatory variables in separate regression equations. GDI and 14 components—again some overlapping—are also used as explanatory variables. Neither GDP, GDI, nor any of their components are statistically significant at $p \leq 0.05$.

If the sample period is broken into two sub-periods, the results are very different for the sub-periods. The sub-periods are chosen—somewhat arbitrarily—to be 1970-83 and 1984-2004. The earlier period is roughly the period of high inflation, and the later

[3] For example, investment in computers and computer programs—which account for more than one-seventh of all private fixed investment in 2005—is zero by assumption prior to 1959.
[4] This redo was done by Erick Sager, who was a BEA intern in the Joint Program in Statistical Methodology in the summer of 2004.
[5] Aggregate U.S. economic activity, in current dollars, grew by a factor of 16 from 1970 to 2004.
[6] There are no estimates of the real discrepancy because it is not possible to independently calculate real values for GDI and its components. The real GDI estimates in the NIPAs make use of the GDP price index, which is not invariant to the composition of GDP.

period the period of lower inflation. The GDP price index increases at a 6.9 percent average rate in 1970-83 and a 2.6 percent average rate in 1984-2004. In contrast, the average growth rates of real GDP in the two sub-periods are much closer, at 2.8 and 3.5 percent, respectively.[7] In addition to lower inflation, the second sub-period also roughly coincides with an era of lower GDP volatility, as indicated by some analysts (see, e.g., McConnell and Perez-Quiros, 2000, and Stiroh, 2005).

In the 1970-83 period, coefficients for GDP, GDI, and 21 of 26 income and product-side components are statistically significant at the $p \leq .05$ level. In contrast, in the 1984-2004 period, coefficients of only 3 components are statistically significant at the $p \leq .05$ level. Only one component, fixed nonresidential investment is significant in both periods, and its coefficients switch sign between the two periods.

The large number of statistically significant components in the 1970-83 period suggest that the significance results may be due to trends in the size of the current-dollar measures of the economy that result primarily from high inflation. To examine this possibility, three trended variables are also tried as explanatory variables for the discrepancy. The first is a "year" variable, in which the value in each year was assigned to be the year's value—that is, for example, the value for year in 1970 is set equal to 1970. The second is a "trend" activity variable that is a Hodrick-Prescott filtered average of GDP and GDI, using a λ penalty parameter of 100. The third measure is the sum of GDP and GDI. Each of these three measures are chosen to contain minimal information about the statistical discrepancy. Even so, all three measures are statistically significant at the $p \leq .05$ level in the 1970-83 period, and not significant in either the 1984-2004 period or the full, 1970-2004 period. The coefficients are all significantly positive in the 1970-83 period and insignificantly negative in the 1984-2004 period. The results are consistent with the hypothesis that high inflation drives the apparent relationships in the earlier period, but not in the later period.

To avoid inflation-driven results, in the following estimates the statistical discrepancy is scaled as a ratio to the Hodrick-Prescott-filtered trend economic activity estimates. Chart 1 shows the ratio of the statistical discrepancy to the trend, expressed in percentage terms. The ratio has an average of 0.76 percent, a variance of 0.59 percent, a high value of 2.12 percent in 1993, and a low value of -1.29 percent in 2000. In contrast to GDP and GDI estimates, the ratio has grown somewhat more volatile since the mid-1980s.[8]

The scaling to the trend also has the effect of mitigating severe multicollinearity problems encountered in estimating the relationship of the levels of the discrepancy to various income and product side components. Disaggregating GDP into the seven major components detailed above, and excluding change in private inventories, the average absolute correlations among the components are 0.943 in the 1970-83 period, and 0.956

[7] Attempts to insert inflation, or inflation volatility as an additional explanatory variable in equations of the form of those in table 1 were not successful. They were never statistically significant in the alternative equations.

[8] The variance of the ratio is 0.17 in 1970-83 and .78 in 1984-2004.

in the 1984-2004 period. In comparison, the average absolute correlation of the discrepancy with the components is 0.630 in the earlier period and 0.291 in the later period. In contrast, after scaling to the trend, the average absolute correlation among the product side components is 0.436 in the earlier period and 0.398 in the later period. The average absolute correlation of the discrepancy to trend with the de-trended product-side components is 0.229 and 0.393 in the two periods, respectively. Thus, although the problem of multicollinearity is mitigated, it is far from eliminated.

Similar relationships (not shown) hold for the income-side components and the discrepancy.

Table 2 shows regression equations explaining the de-trended statistical discrepancy for the full 1970-2004 period, and for the two sub-periods, 1970-83 and 1984-2004. The same levels of disaggregation as shown in table 1 are shown for the components of GDP and GDI. In contrast to the full-period estimates reported for the level-specification equations, 9 components have statistically significant coefficients, with $p \leq 0.05$. Also in contrast, only 2 of the coefficients of the components are statistically significant in the earlier period, with $p \leq 0.05$. In the later period, 11 components and GDI are statistically significant.

Looking at the results presented in the two tables, several themes appear. The first is that the determinants of the statistical discrepancy since 1984 are different from those between 1970 and the early 1980s. In 1970-83 and using level specifications, trend growth of the current-dollar economy appears to drive the apparent relationships between the discrepancy and income and product side components, and nearly all of the estimated relationships—including those like "year" that have little or no economic content—are significant. In 1984-2004, there are few significant relationships between the level of the discrepancy and the levels of income and product side components. For the full 1970-2004 period, there is only one weakly statistically significant estimate (with $p \leq 0.10$), fewer than might be expected by chance.

With the de-trended formulations, in 1970-83 there are no statistically significant relationships between the statistical discrepancy and product-side components, and only a modest number between the discrepancy and income-side components. In 1984-2004, there appear to be statistically significant relationships between the discrepancy and durable personal consumption expenditures, information processing equipment and software investment (IPES), residential investment, and imports. The statistical significance of the coefficients of personal consumption expenditures (PCE) for durables and IPES is puzzling because the estimates appear to be well measured in economic censuses and annual economic surveys. The statistical significance of total PCE and fixed nonresidential investment reflect the significance of PCE for durables and IPES. The statistical significance of residential investment may reflect the use of phasing patterns for housing construction following starts that may not match what actually happened in any given year.

In addition to GDI, 5 income side components are statistically significant in 1984-2004. None of the product or income-side components are statistically significant in both periods. Rest-of-world corporate profits, and their separate outflows are significant in the earlier period. Anecdotal evidence suggests that multinational corporations tend to record profits in countries in ways that may reduce their exposure to taxation. This could lead to measured profits that are weakly linked to production and economic conditions in the U.S. The capital consumption adjustment is weakly statistically significant in both periods, with $0.05 < p \leq 0.10$, and with estimated coefficients that are not statistically significantly different from one another. The statistical significance of proprietors' income in 1984-2004 may reflect the difficulties of obtaining accurate information from available source data.

With the de-trended specifications, the 9 components that are statistically significant for 1970-2004 reflect the statistical significance of the components in 1984-2004. None of the components are statistically significant in both earlier and later periods. Most components that are statistically significant for the whole period have p values that are larger than those for the components in the later period. Thus, the quantitative results for the de-trended discrepancy and the de-trended components do not strongly identify any components as being sources of the discrepancy in the earlier period. Two income-side components, taxes on production and imports and business current transfer payments, have estimated coefficients for the later period that are 4 or more standard deviations larger than 1.0, a result that seems incompatible with any measurement error formulation of causation for the statistical discrepancy. These high coefficients are best regarded as statistical accidents.

Despite the problems of multicollinearity, it is possible to further examine the statistical discrepancy's relationship to more than one component in the same equation. Table 3 shows, for the 1984-2004 period, equations explaining the de-trended statistical discrepancy by multiple de-trended components. All of the components included have p-values in 1984-2004 of less than .01 in equations shown in table 2 (for consumption of fixed capital, a p-value of less than .01 for the full 1970-2004 period). The first line of each equation shows the estimated coefficients, and the second line shows the coefficients' p-values.

The first 4 equations use the three most significant product-side components in varying combinations. PCE for durables and IPES together yield an R-bar-square of slightly less than .67. The other combinations are less successful, and imports are not statistically significant whenever they are combined with IPES. The fifth equation adds GDI as an explanatory variable and finds that it is statistically significant, and the equation has an R-bar-square of more than .75.

Equations 6 to 11 contain various combinations of the income-side components that were significant in the equations reported in table 2. Compensation—which makes up more than half of GDI—is always statistically significant. Proprietors' income is also statistically significant. The capital consumption adjustment and consumption of fixed

capital are statistically significant in some equations, depending on which income-side components are included.

The last 4 equations combine two product-side components—PCE for durables, and IPES—with the successful income-side components. The most successful equation contains compensation and the two product-side components, and yields an R-bar-square of slightly less than .78. The capital consumption adjustment is not significant.

The results of the quantitative estimates are thus mixed in the 1984-2004 period. A simple hypothesis of measurement error in proportion to sizes of components results in nearly half of the de-trended components being statistically significantly related to the statistical discrepancy.[9] Equations that explain up to four-fifths of the variance of the de-trended discrepancy can be estimated. Nevertheless, the set of widespread statistically significant estimates mean that no small set of components can be identified as likely sources of the statistical discrepancy. There are too many significant relationships; some results may be the proxying for the effects of other economic measures. Also, some apparently well-measured components, such as IPES are robust contributors in the multivariate equations explaining the discrepancy. In contrast, some hard-to-measure components—like proprietors' income—are also robust contributors.

Summary and Conclusions

The difference between gross domestic product (GDP) and gross domestic income (GDI), which is called the statistical discrepancy, represents net sum of all of the measurement errors in estimating the their respective components. The vintage of the estimates makes a difference as to the empirical relationships between the statistical discrepancy and the components. BEA's redo of an earlier study by Klein and Makino (op. cit) that used data available prior to the 1999 comprehensive benchmark revision found that there were statistically significant relationships that disappear if the latest-available estimates are used in equations explaining the discrepancy. One interpretation of this finding is that improvements to the NIPA estimates in the 1999 and 2003 comprehensive benchmark revisions may have eliminated some previously-existing net measurement errors.

Many components of both GDP and GDI have contributed to the movements in the statistical discrepancy in the last two decades. It is not possible, however, to identify specific components as contributing to the discrepancy, or even whether the same components are contributing in different years or multi-year periods. Multivariate regression equations explain most of the variance of the discrepancy but do not provide not strong evidence that the components used in the equations were of premier importance. High correlations among the components appear to drive the results and the estimates of coefficients are to an unknown extent due to multicollinearity. Further, in the period from 1970 to 2004, there do not appear to be many significant contributors that can be identified using the methodology employed in the current study. Thus, based on

[9] Excluding the details of rest-of-world corporate profits.

the study, there is nothing that can be done to consistently reduce the size of the statistical discrepancy.

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Appendix—Comprehensive Benchmark Revisions and the Statistical Discrepancy

The December 2003 comprehensive bencchmark NIPA revision made large revisions to the statistical discrepancy at least as far back as the late 1980s. An informal review of the preceding four comprehensive revisions found that they also made large revisions to the discrepancy. This appendix looks at quarterly estimates.

Earlier, unpublished work on NIPA revisions found that, in the 2003 comprehensive revision mean absolute revisions to GDP prior to the mid-1970s were much smaller than those in more recent years. This apparently is the result of how the comprehensive revisions are made. Although definitional revisions are usually carried all the way back to the earliest observations affected by the definitional changes, methodological revisions typically are carried back only about 2 ½ decades. Further, although definitional changes carefully match their effects on the income and product sides of the NIP account, this is not so for methodological changes. Thus, in the 2003 comprehensive revision the methodological changes affected the discrepancy as far back as they are made—even prior to the previous benchmark year (1992). However, revisions to the discrepancy were modest prior to 1987, and substantial thereafter (chart A1).

Quarterly-frequency regression equations were estimated to evaluate the relationship of the post-2003 comprehensive revision statistical discrepancy estimates to the estimates prior to the comprehensive revision. The regression equations used the functional form

$$F(SD_{new})_t = a_0 + a_1 * F(SD_{old})_t ,$$

and the functional form F was taken to be either levels or first differences. Because the discrepancy estimates may have both positive and negative values, they are measured in dollars rather than the percent change form used in most NIPA revisions studies. As a result, the standard errors of the equations and the standard deviations of the dependent variable (the discrepancy) are in billions of dollars.

In the 2003 comprehensive revision, there was a sharp break between the results for 1976 and earlier years and those for 1977 and later years. In the first set of equations, the dependent variable is the December 2003 estimates of the statistical discrepancy and the explanatory variable is the estimates available as of November 2003, immediately prior to the comprehensive revision. Table A1 summarizes the results of these regressions. The estimates are made using ordinary least squares, and corrections for serial correlation are not made in order to ease the comparisons between functional forms and sample periods. Estimated coefficients are not shown; the a_1 values cluster around 1.0, and their p-values are all less than .0001. The standard errors of the equations and the standard deviations of the statistical discrepancy (new) are shown in order to facilitate comparisons.

The level and first difference equations for the period 1977Q1-2003Q4, although highly statistically significant, have modest fits as indicated by adjusted R-squares. The standard errors—at $34 and $19 billion for levels and first differences, respectively—are somewhat more than half the standard deviations of the discrepancy estimates. Thus, although there is a statistically significant relationship between the pre-and post-comprehensive revision estimates of the statistical discrepancy, it is not a particularly close one.

The level and first-difference equations for the period 1950Q1-76Q4 indicate dramatically closer fits to the post-revision discrepancy estimates. The adjusted R-squares are more than .99 for the level equation and .97 for the first difference equation. Standard errors are roughly $1/2 billion, much smaller than the standard deviations of nearly $7 and $4 billion. Thus, prior to 1977 there is a very close relationship between the pre- and post-revision estimates of the statistical discrepancy.

Table A1. Equations Explaining the Post-2003 Comprehensive Benchmark Estimates of the Statistical Discrepancy

Sample period, measure	Level specification	First-difference specification
1977Q1-2002Q4		
R-bar-square	.733	.620
Standard error	33.613	19.218
Standard deviation	65.049	31.174
1950Q1-1976Q4		
R-bar-square	.994	.974
Standard error	0.527	0.615
Standard deviation	6.577	3.825

It is useful to examine whether the modest relationship between pre-and post-benchmark estimates of the statistical discrepancy has existed for other comprehensive revisions. TableA2 repeats the regression experiments using the discrepancy estimates available immediately before and following the October 1999 comprehensive revision. The sample period again begins with 1977Q1, but ends with 1998Q4. The functional forms are the same as those for the regressions presented in Table A1.

Table A2. Equations Explaining the Post-1999 Comprehensive Benchmark Estimates of the Statistical Discrepancy

Sample period, measure	Level specification	First-difference specification
1977Q1-1998Q4		
R-bar-square	.439	.608
Standard error	22.522	13.067
Standard deviation	30.077	20.864

The qualitative results for the 1999 revision are generally similar to those from the 2003 revision.[10] The adjusted R-squares indicate only modest, but statistically significant fits. Again, the standard errors of the equations are more than half as large as the standard errors of the dependent variables.

Thus, based on the two most recent comprehensive NIPA revisions, the estimates of the statistical discrepancy following the revision can be expected to be only modestly related to the estimates prior to the comprehensive revision for the two decades leading up to the year a comprehensive benchmark revision is made.

Revisions to the statistical discrepancy can also be compared to revisions in the estimates of GDI and GDP. Equations explaining the post-2003-comprehensive-revision estimates and using the pre-revision estimates as explanatory variables can be estimated using the same functional forms as are used for the discrepancy. These are summarized in table A3.

Table A3. Equations Explaining the Post-2003 Comprehensive Benchmark Estimates of GDP and GDI;
1977Q1 to 2002Q4

Measure	Level specification	First-difference specification
GDP:		
R-bar-square	1.000	.843
Standard error	17.815	14.891
Standard deviation	2551.324	37.639
GDI:		
R-bar-square	1.000	.892
Standard error	26.432	14.223
Standard deviation	2567.640	43.194

The level and first difference equations for GDP and for GDI yield roughly similar in results, with R-bar-squares of 1.0 for levels and somewhat more than 0.8 for first differences. The standard errors for both the level of GDP and the first differences of both GDP and GDI are similar, but the standard error for the level of GDI is quite a bit larger than the other standard errors. The standard deviations for the levels of GDI and GDP are very large because the measures trend strongly over the sample period. However, the standard deviations of the first differences are very roughly three times the sizes of the standard deviations. The p-values for the estimated explanatory variable coefficients are all less than .00005.

In comparison to the equations for the statistical discrepancy in the 1977-2002 period, the R-bar-squares are substantially higher, and the standard errors are lower. Adding the old statistical discrepancy to the four equations as an additional explanatory variable, in either level or first difference form, does not improve fits and the discrepancy's coefficients are never statistically significant (not shown).

[10] The equations for the 2003 benchmark were also estimated over the shorter, 1977-1998 time period. The quantitative results are roughly similar to those shown in the upper panels of table A1.

In sum, in the period since 1977 there have been only modest, but statistically significant relationships between estimates of the statistical discrepancy immediately prior to and following both the 1999 and 2003 comprehensive revisions of the NIPAs. There have been noticeably closer and significant relationships between pre and post-revision estimates of GDP and GDI

Chart A1.--2003 Comprehensive Revisions to GDP, GDI, and the Statistical Discrepancy

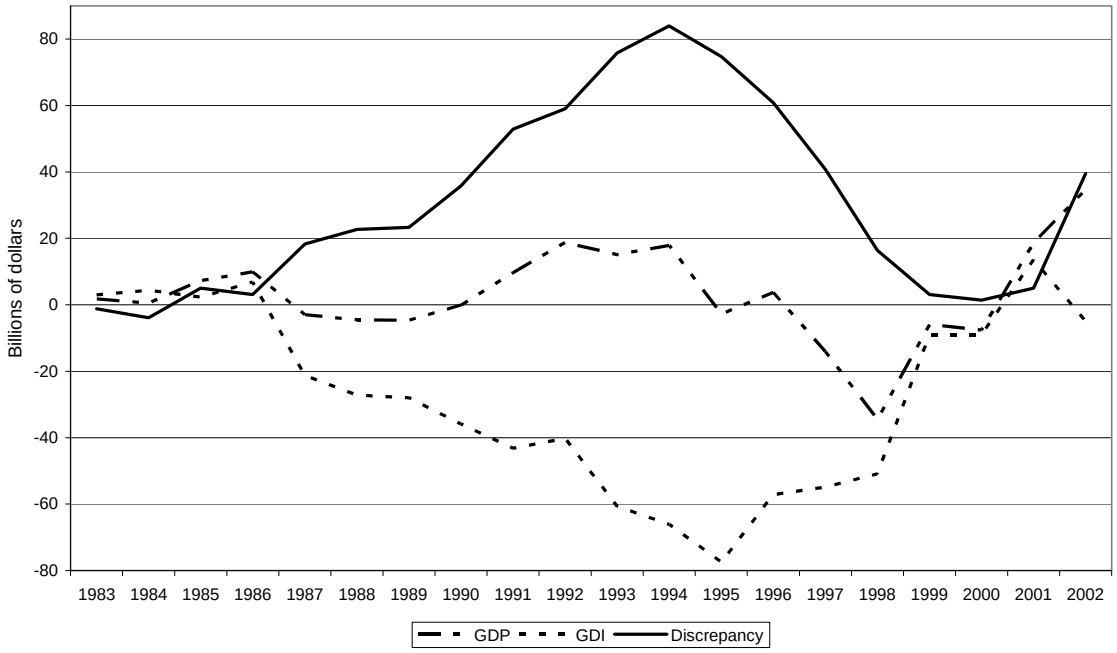

Chart 1--Ratio of the Statistical Discrepancy to Trend Economic Activity

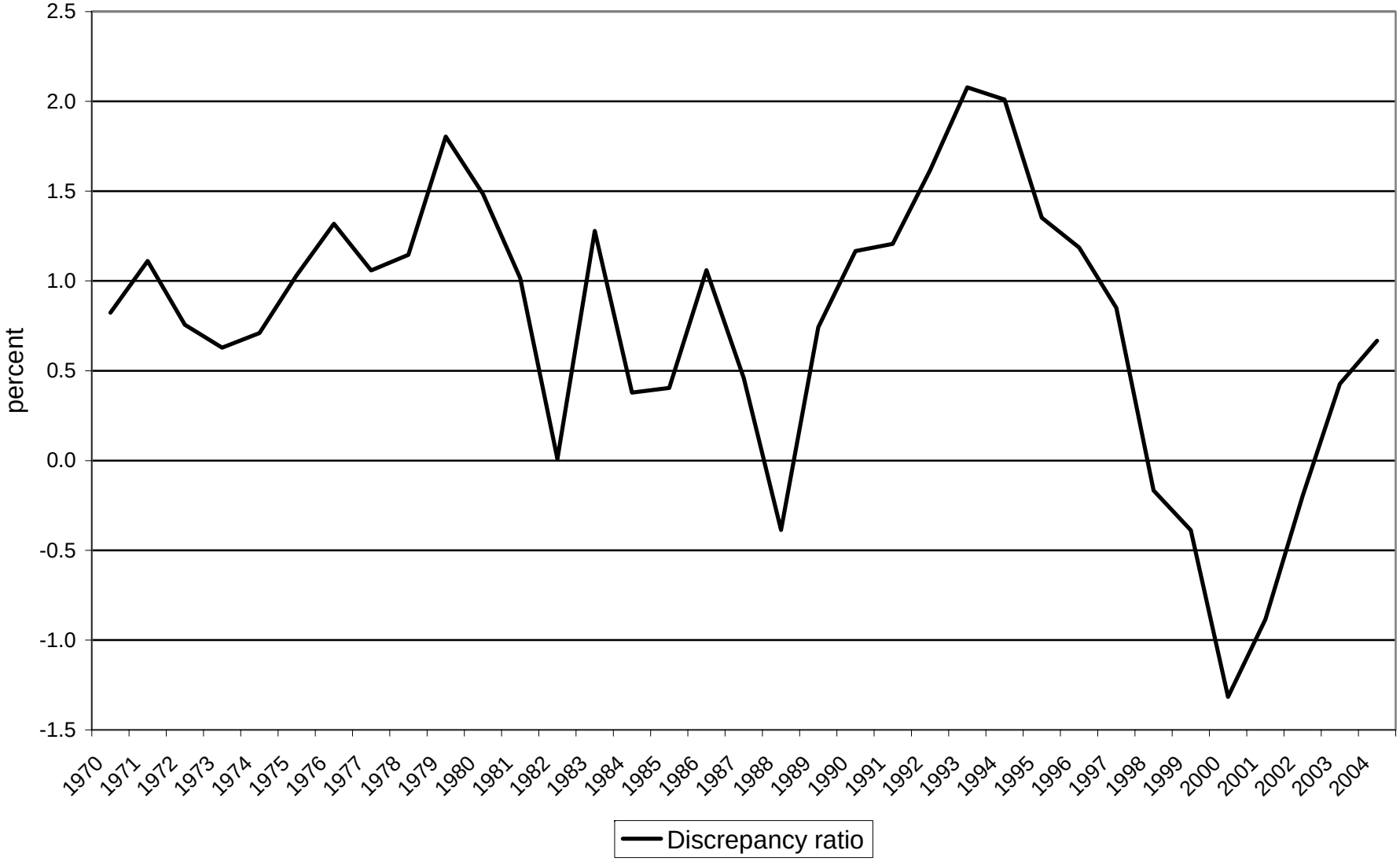

Table 1.--Equations Explaining the Statistical Discrepancy to GDP, GDI and Their Components

Functional form: $SD = a + b^* X_i$

Explanatory Variable	1970-2004			1970-1983			1984-2004		
	Coefficient	p-value	R-bar-square	Coefficient	p-value	R-bar-square	Coefficient	p-value	R-bar-square
Gross domestic product	0.000	0.882	-0.030	0.011	0.024	0.305	-0.008	0.255	0.019
PCE	-0.001	0.840	-0.029	0.016	0.025	0.298	-0.010	0.251	0.020
durables	-0.015	0.652	-0.024	0.162	0.010	0.387	-0.113	0.127	0.072
nondurables	-0.001	0.940	-0.030	0.046	0.024	0.305	-0.039	0.278	0.012
services	-0.001	0.836	-0.029	0.030	0.033	0.271	0.016	0.271	0.014
Fixed nonresidential investment	-0.019	0.473	-0.014	0.071	0.032	0.273	-0.115	0.048	0.148
information processing equipment & software	-0.059	0.370	-0.005	0.292	0.040	0.250	-0.245	0.054	0.139
other	-0.029	0.701	-0.026	0.222	0.009	0.396	-0.254	0.126	0.072
Residential investment	-0.023	0.698	-0.026	0.075	0.001	0.594	-0.142	0.221	0.029
Change in private inventories	0.239	0.528	-0.018	0.168	0.601	-0.058	0.145	0.806	-0.049
Exports	-0.004	0.878	-0.030	0.104	0.019	0.326	-0.056	0.312	0.004
Imports	-0.011	0.555	-0.019	0.096	0.013	0.366	-0.054	0.148	0.060
Government	0.001	0.939	-0.030	0.051	0.035	0.264	-0.037	0.363	-0.007
Gross domestic income	-0.001	0.807	-0.028	0.011	0.027	0.290	-0.008	0.207	0.034
Compensation of employees	-0.001	0.786	-0.028	0.018	0.027	0.293	-0.015	0.194	0.039
Taxes on production and imports	-0.001	0.985	-0.030	0.151	0.037	0.256	-0.088	0.347	-0.004
Subsidies	-0.194	0.764	-0.027	1.404	0.097	0.147	-3.129	0.075	0.113
Net interest and miscellaneous payments	-0.023	0.618	-0.022	0.085	0.087	0.160	-0.348	0.010	0.263
Business current transfer payments	-0.356	0.308	0.002	1.335	0.054	0.216	-1.595	0.024	0.199
Proprietors' income with IVA & CCAdj	-0.018	0.656	-0.024	0.266	0.005	0.447	-0.106	0.183	0.044
Rental income …	-0.087	0.646	-0.024	0.518	0.430	-0.026	-0.355	0.290	0.009
Corporate profits with IVA and Ccadj	0.010	0.796	-0.028	0.225	0.004	0.476	-0.036	0.647	-0.041
rest of world	-0.011	0.556	-0.019	0.987	0.006	0.432	-0.462	0.172	0.048
outflows	-0.029	0.936	-0.030	5.236	0.000	0.679	-0.220	0.676	-0.043
inflows	-0.055	0.665	-0.024	0.872	0.003	0.499	-0.226	0.299	0.007
Current surplus of government enterprises	3.050	0.090	0.057	-4.568	0.046	0.233	4.555	0.155	0.056
Consumption of fixed capital	-0.006	0.802	-0.028	0.071	0.039	0.253	-0.067	0.208	0.034
Capital consumption adjustment	-0.110	0.433	-0.011	-0.178	0.534	-0.048	-0.377	0.145	0.062
Addenda:									
Year	0.194	0.836	-0.029	2.198	0.019	0.327	-2.384	0.355	-0.005
Trend activity	0.003	0.909	-0.030	0.010	0.024	0.302	-0.007	0.278	0.012
GDP+GDI	0.000	0.844	-0.029	0.005	0.025	0.298	-0.004	0.230	0.026

Coefficients in grey cells indicate statistical significance at the 5 percent level.

Table 2.--Equations Explaining the Ratio of the Statistical Discrepancy to Trend Economic Activity by the Ratios of GDP, GDI and Their Components to Trend Economic Activity

Functional form: SD / Trend = a + b* X_i / Trend

Explanatory Variable	1970-2004			1970-1983			1984-2004		
	Coefficient	p-value	R-bar-square	Coefficient	p-value	R-bar-square	Coefficient	p-value	R-bar-square
Gross domestic product	-0.015	0.677	-0.025	-0.007	0.746	-0.073	-0.210	0.223	0.028
PCE	-0.087	0.033	0.104	-0.014	0.715	-0.071	-0.231	0.047	0.149
durables	0.538	0.022	0.124	0.034	0.850	-0.080	-1.427	0.001	0.448
nondurables	0.077	0.133	0.039	-0.028	0.675	-0.067	0.142	0.462	-0.222
services	-0.057	0.042	-0.096	-0.022	0.752	-0.074	-0.096	0.256	0.018
Fixed nonresidential investment	-0.197	0.104	0.050	0.025	0.819	-0.078	-0.523	0.006	0.300
information processing equipment & software	-0.423	0.003	0.218	0.075	0.795	-0.077	-1.092	0.002	0.390
other	-0.476	0.353	-0.005	0.392	0.220	0.049	0.203	0.320	0.001
Residential investment	0.136	0.506	-0.016	0.180	0.234	0.042	-0.757	0.041	0.160
Change in private inventories	0.109	0.697	-0.026	0.098	0.644	-0.063	0.056	0.913	-0.052
Exports	-0.073	0.403	-0.008	0.095	0.329	0.003	-0.045	0.783	-0.048
Imports	-0.130	0.012	0.151	0.092	0.235	0.042	-0.294	0.010	0.264
Government	0.100	0.184	0.024	-0.055	0.418	-0.023	0.181	0.224	0.028
Gross domestic income	-0.056	0.111	0.047	-0.013	0.563	-0.052	-0.393	0.000	0.512
Compensation of employees	-0.052	0.334	-0.001	-0.017	0.615	-0.060	-0.536	0.001	0.404
Taxes on production and imports	0.148	0.448	-0.012	-0.013	0.316	0.007	4.546	0.001	0.427
Subsidies	-1.462	0.281	0.006	-0.739	0.504	-0.042	-0.475	0.872	-0.051
Net interest and misc. payments	-0.114	0.199	0.021	-0.025	0.778	-0.076	-0.086	0.612	-0.381
Business current transfer payments	-2.988	0.001	0.285	-0.281	0.869	-0.081	-7.150	0.000	0.509
Proprietors' income with IVA & CCAdj	-0.221	0.219	0.017	-0.012	0.922	-0.082	-1.082	0.009	0.269
Rental income …	-0.164	0.622	-0.023	-0.333	0.190	0.067	-0.210	0.730	-0.046
Corporate profits with IVA and Ccadj	0.064	0.654	-0.024	0.062	0.587	-0.056	0.043	0.860	-0.051
rest of world	-1.087	0.041	0.094	0.861	0.026	0.057	-1.592	0.075	0.113
outflows	-0.948	0.123	0.042	6.095	0.001	0.557	-0.882	0.264	0.160
inflows	-0.666	0.039	0.097	0.982	0.073	0.180	-0.798	0.097	0.092
Current surplus of government enterprises	-0.479	0.728	-0.026	-1.659	0.371	-0.011	6.103	0.055	0.137
Consumption of fixed capital	-0.339	0.094	0.055	0.001	0.997	-0.083	-1.877	0.005	0.308
Capital consumption adjustment	-0.424	0.004	0.223	-0.338	0.081	0.169	-0.643	0.058	0.133

Coefficients in grey cells indicate statistical significance at the 5 percent level.

Table 3.--Equations Explaining the Ratio of the Statistical Discrepancy to Trend Economic Activity Using the Ratios of GDP, GDI and Their Components to Trend Economic Activity; 1984-2004

	PCE durables	IPES	Imports	GDI	Compensation	Prop. Income	CCAdj	CFC	R-bar-square	F-test p values
1	-1.137	-0.828							0.665	0.000
	0.001	0.002								
2	-1.201		-0.205						0.567	0.000
	0.001		0.023							
3	-1.148	-1.010	0.068						0.650	0.000
	0.001	0.035	0.633							
4		-1.151	0.022						0.357	0.007
		0.069	0.910							
5	-0.578	-0.761		-0.224					0.755	0.000
	0.082	0.001		0.013						
6					-0.472	-0.885			0.591	0.001
					0.001	0.006				
7					-0.483		-0.209		0.387	0.005
					0.008		0.501			
8					-0.395			-0.813	0.409	0.003
					0.055			0.297		
9						-1.379			0.296	0.016
						0.005				
10						-1.017	-0.572		0.383	0.005
						0.009	0.048			
11						-0.743		-1.391	0.405	0.004
						0.059		0.015		
12	-0.619	-0.858			-0.340				0.779	0.000
	0.040	0.000			0.005					
13	-0.898	-0.902					-0.210		0.652	0.000
	0.081	0.003					0.550			
14	-0.608	-0.891			-0.331				0.765	0.000
	0.067	0.051			0.042					
15	-0.434	-0.917			-0.337		-0.167		0.770	0.000
	0.318	0.001			0.007		0.561			