The anatomy of the underground economy

EDGAR FEIGE

1. INTRODUCTION

When physicists conjecture the existence of a heretofore unobserved particle or energy force whose presence would challenge some current interpretations of natural laws, such claims are rightfully met with both excitement and skepticism. The excitement is engendered by the possibility that observed anomalies might be reconciled within a broader conceptual framework. The skepticism is motivated by the lack of precision which characterizes most novel rudimentary ideas and by the absence of reliable empirical observations for verification.

Economists have responded in like manner to the challenges generated by the 'unobserved income hypothesis' (UIH). During the past five years, a growing amount of professional attention has been focused on the conjecture that there exists a significant and growing 'underground economy' that has eluded the observational domain of professional economists. If that conjecture is correct, it requires a rewriting of recent economic history in order to correct the biases introduced into our key economic indicators. Hopefully, such modification of the economic 'facts' will help to resolve some of the macroeconomic anomalies of the 1970's wich are acknowledged to have thrown our profession into a state of crisis. The hypothesis, furthermore, encourages a thoroughgoing reexamination of theories entertained to explain such key issues as the decline in economic growth rates, high levels of unemployment, the productivity slowdown and growing government deficits (2).

At its core, the UIH challenges the veracity of the fundamental data base that macroeconomics relies on for the formulation of theories and tests of prevailing hypotheses. It is therefore not surprising that the issue of the 'underground economy' has provoked considerable academic controversy and a strong reaction from the traditional custodians of the economic information system. Governmental agencies responsible for the production of national income accounts, census information, labor market indicators and tax records have been challenged to reexamine and appropriately revise the basic statistics upon which policy makers and academics rely.

Those of us who have been troubled by the malaise which has characterized our discipline during the past decade,

have embraced the notion that the existence of a growing 'underground economy' might shed new light on the current controversies in macroeconomics and public finance (3). In our enthusiasm to pursue a new line of thinking, we have perhaps both overstated the promise of the idea and placed too much confidence in the valiant, albeit rudimentary, efforts to measure the 'underground economy'. The skeptics have rightly pressed for a more precise definition of the phenomenon and a more rigorous derivation of its conjectural implications. Most prominently, they have challenged the methods proposed for its measurement.

Concern with the implications of the 'underground economy' has raised a new set of questions for investigation:

(1) How are we to define the 'underground economy' and how can we measure its size and growth?
(2) How will a growing 'underground economy' affect traditional measures of economic growth, prices, unemployment, productivity, and budget deficits?
(3) What are the causes of a growing 'underground economy' and what are its implications for stabilization policies, economic efficiency, the distribution of income, taxation and expenditure policy and general economic welfare?

Now that the ideas of 'underground economists' have permeated the consciousness of the academies and governmental agencies, their usefulness and truth value is being more seriously investigated. Sufficient time and energy has been expended by both enthusiasts and critics alike, to warrant a fresh assessment of the state of the art. This paper addresses two issues which are prerequisites to such an assessment. The first is to explicate a more precise taxonomic framework for describing the phenomenon in question. The second is a more technical examination of some of the empirical measures which have been proposed to measure the size and growth of the 'underground economy'.

Unfortunately, the term 'underground' has been used by different investigators to mean quite different things. These unresolved questions of definition introduce considerable confusion in the literature. Theoretical and empirical research require a finer set of conceptual distinctions to clarify both the differences and the interconnections among the variety of descriptive terms presently employed by 'underground economists'. To this end, I wish to put forward a taxonomic framework which differentiates economic, fiscal, and social concepts of income. The first section of this paper elaborates these income concepts and establishes their interrelationships.

The second section discusses the empirical counterparts to the conceptual definitions developed in section I, and reviews some of the recent contributions of government agencies in the United States to estimating the size and growth of the 'underground economy'. Extensive efforts have been undertaken by the Internal Revenue Service (IRS) to measure the degree of non-compliance with existing tax codes. These

results, in turn, have led the Bureau of Economic Analysis (BEA) to undertake significant revisions in the U.S. National Income and Product Accounts (NIPA). These new results are of considerable importance since they go well beyond earlier government admissions of data base deficiencies and represent the first steps in the process of historical revision. Although there are still significant differences between conceptually comparable estimates of the 'underground economy', these recent government findings lend greater scientific credence to the proposition that the 'underground economy' is a vital area of investigation whose full fruits have yet to be harvested.

The third section utilizes both the IRS findings and the transaction method results to estimate 'tax gaps', namely, the shortfall in tax revenues which results from non-compliance with the tax codes. The tax gap estimates in turn enable us to estimate the 'full compliance deficit' for the years 1979 and 1980.

The final section contains a summary and conclusions.

1. ALTERNATIVE CONCEPTS OF 'INCOME' AND THEIR RELEVANCE TO ECONOMIC INQUIRY

The burgeoning literature produced by 'underground economists' has generated a plethora of vague and evocative terms (underground, subterranean, informal, hidden, parallel, black, clandestine, second, etc.) which have served to confuse rather than to clarify the important substantive issues raised by the discovery that potentially significant segments of economic activity may be imperfectly accounted for in the conventional data bases forming the very foundation of empirical inquiry in economics.

Alternative measures of the size of the 'underground economy' have revealed a wide range of estimates of its magnitude. These apparent inconsistencies suggest not only the difficulty of attempting to estimate a phenomenon whose raison d'être is to defy detection, but more importantly, the fact that the different measures are incommensurable since they are estimates of different conceptual entities. To date, little effort has been devoted to the elaboration of useful conceptual distinctions of different notions of 'underground income' and to the reconciliation of diverse empirical measures. What is required is a taxonomic framework that discriminates among different aspects of the phenomenon and provides empirical links between the various theoretical constructs and their real-world counterparts. One of the key ambiguities which plagues the literature on the underground economy is the repeated confusion between economic and fiscal concepts of income. All too often, the underrecording of income in the National Income and Product Accounts (NIPA) has been erroneously identified with the issue of tax evasion.

1.1. Total economic income

Macroeconomic theory defines income as the maximum amount of consumption which can be undertaken in a given period without altering the stock of wealth. In principle, this broad notion of total economic income makes no distinction between market and non-market consumption. Conceptually, consumption of goods and services includes all items which have positive market or shadow prices due to their relative scarcity. In practice, however, empirical measures of economic income are limited to the consumption of legally produced market goods and services (produced by labor, capital and property) supplied by residents of a given country during a specified time period. The conventional macroeconomic accounting practices which are embodied in the National Income and Product Accounts (NIPA) thus necessarily sacrifice conceptual completeness in order to reduce the cost and error of quantification. If we define recorded income as that component of total economic income which is empirically captured in the NIPA statistics, then unrecorded income can be seen to consist of:

1) income produced in economic activities socially deemed 'illegal'
2) income produced in non-market (bartered) legal activities
3) income produced in legal market activities (monetary) which, for various reasons, escape NIPA measurement.

A simple taxonomic framework for Total Economic Income and its components is displayed in Table 1.

In principle, total economic income includes all income produced in both the market and the nonmarket sector. Precisely what determines the boundary (AB) between these two sectors is one of the major substantive issues of micro labor economics with its emphasis on labor force participation rates. Development economics, is largely concerned with the macro determinants of the boundary, and the rapidity with which it shifts up over time. Empirical estimates (4) suggest that the nonmarket sector (primarily household production) ranges between 32 percent and 60 percent of the market economy. Some authors have referred to the output of the nonmarket sector as the 'informal economy' (5) whereas others have used the same term to describe market activities (6).

Both market and nonmarket income-producing activities can be further classified according to the societies' social conventions as embodied in legal statutes which distinguish between legal and illegal activities. Social income, as distinct from economic or fiscal income, identifies those income-producing activities which are regarded as illegal under criminal law. Illegal income-producing activities are presently excluded from United States NIPA, whereas the UN-OECD System of National Accounts (7) makes no distinction between legal and illegal activities. In the United States, the boundary displayed in Table 1 as CD is established solely by social convention.

Table 1

Taxonomic Framework for Economic Income

Theoretical Construct	Market Classification	Legal Status Activity	Reporting Status	NIPA Component
Total Economic Income	Market Income	Illegal Activity	Unrecorded Income	Monetary Unobserved Sector
		C_____D	E_____F	G_____H
		Legal Activity	Recorded Income	Estimated Gross National Product
	A_____B	A_____B	A_____B	
	Non-market Income		Imputed Income	
			E_____F	G_____H
		Legal Activity	Unrecorded Income	Non-monetary Unobserved Sector
		C_____D		
		Illegal Activity		

What is germane to the issue of the 'underground economy' as it relates to economic income is the question of what is and what is not recorded in NIPA. As displayed in Table 1, recorded income (8) includes most legal market income as well as minor imputations for particular components of legal nonmarket income (9). Unrecorded income thus includes illegal market and nonmarket activities. In addition, unrecorded income includes legal market income that unwittingly escapes NIPA detection (the upper CD - EF boundary in Table 1) as well as legal nonmarket income (the lower CD - EF boundary) which is conventionally excluded from NIPA accounts due to the difficulties engendered in measuring the size of this component.

Unrecorded 'illegal' income arises from the production and distribution of goods and services which are regarded as illegal by social convention. In the United States, such goods include drugs and pornographic materials; services include prostitution and value added in loan-sharking. In practice, such illegal activities are excluded from the accounts, except to the extent that some illegally produced income might be 'laundered' into data sources underlying NIPA.

The final component of total economic income is unrecorded legal market income. Legally produced income can escape measurement in NIPA's as a result of deficiencies in NIPA estimation procedures and underlying data sources.

1.2. Fiscal income

Fiscal Income is defined by legislative tax status which identify those sources of 'income' which are to be included in the nation's tax base. On the one hand, fiscal income is a broader concept than total economic income since it includes realizations of appreciated asset values in addition to income earned from currently produced goods and services. On the other hand, it is a narrower concept, since economic income includes categories of income which are explicitly excluded by the fiscal code. Most nonmarket household production is excluded from fiscal income although it is legitimately considered to be part of total economic income. It is also the case that fiscal income may exclude items which are specifically imputed in NIPA's (10).

The components of fiscal income are determined by fiscal legislation rather than by the economic criterion of current production of scarce goods and services. As displayed in Table 2, a nation's potential income tax base (including total economic income and capital gains realizations) is legally subdivided into taxable and untaxed income. In the US, taxable income includes income earned from illegal activities.

The IJ lines in Table 2 define the tax avoidance boundary, insofar as individuals have legal discretion to shift their activities between taxed and untaxed sectors. Taxable income, from both legal and illegal activities, is further subdivided into reported and unreported income components.

Table 2

Taxonomic Framework for Fiscal Income (Personal Income Taxes)

Potential Tax Base	Legal Classification	Reporting Status	Effective Tax Base	NIPA Relationship
	Untaxed Income I—J	Legally Non reported Income I—J	Avoidance I—J	
		Unreported Income K—L	Evasion M—N	O—P
Total Economic Income	Taxable Income	Reported Income	Adjusted Gross Income	Personal Income O—P
Capital Gains and Other Gains	I—J	K—L Unreported Income I—J	M—N Evasion I—J	
	Untaxed Income	Legally Non reported Income	Avoidance	

Shifts from the reported taxable income sector into the unreported taxable income sector (crossing the KL line) constitute one form of tax evasion, namely underreporting of legal and illegal source taxable income. A second source of tax evasion arises from the overreporting of deductible adjustments to income. Fraudulent overstatement of these adjustments to income is strict tax evasion. On the other hand, tax-induced expenditures on goods or services which constitute allowable deductions are a legitimate form of tax avoidance. The fragility of this distinction has led to the introduction of yet another neologism, 'avoision', to describe questionable practices which raise adjustments to total reported income.

The effective tax base (before deductions) for the Federal personal income tax is known as Adjusted Gross Income (AGI). AGI is the sum of all taxable income sources which have been reported on tax returns, minus adjustments to income. 'Underground income', in the fiscal context, is simply 'unreported income', measured as the difference between the income that should have been reported had the fiscal code been adhered to, and the income actually reported (the areas, IJKL in Table 2).

From the foregoing discussion, it is evident, that 'unreported fiscal income' in not synonymous with 'tax evasion', since tax evasion also includes overstated tax deductions. Moreover, 'unreported fiscal income' is a totally different concept than 'unrecorded economic income'. The former represents an empirical understatement of total taxable income, whereas the latter reflects an underestimation of total economic income.

2. EMPIRICAL ESTIMATES OF UNRECORDED AND UNREPORTED INCOME

The task of identifying and correcting data source and estimation deficiencies in tax data and NIPA accounts is a technically complex and demanding undertaking. For the academic economist, the task is all the more difficult, because of the absence of a comprehensive description of current sources and methods used to construct the accounts. In the United States, thirty years have passed since the last publication of a comprehensive description of the sources and methods employed to construct the nation's most vital economic information base. In many nations, such a compendium of sources and methods is totally lacking. Despite the technical explanations which have accompanied the spate of revisions in NIPA estimates, the foundations of our fundamental economic information system remain in relative obscurity.

One of the most significant contributions of the early academic research on the underground economy has been to stimulate governmental agencies to reexamine their methods of estimation in order to take greater account of data source deficiencies, and to devote more resources to their overdue efforts to document current accounting practices. Major revisions of NIPA's are now being undertaken to re-

flect new information on the extent of tax evasion which has recently been documented by the Internal Revenue Service in the United States. The extent and implications of other forms of underreporting in non tax related underlying data sources have still to be examined.

If one ignores for the moment the conventional exclusion from NIPA of non market, non-monetary income produced in the household, then it can be shown that unrecorded economic income and unreported fiscal income share an empirical relationship, due largely to the fact that national income accountants are forced to rely on tax data as a major source of information for the construction of NIPA. Since fiscal data sources are essential for the construction of NIPA, we first turn our attention to the measurement of Adjusted Gross Income (AGI).

AGI is the total income subject to Federal individual income taxes less certain adjustments such as employee business expenses, moving expenses and alimony payments. Taxed income, is the difference between AGI and various itemized and standard deductions currently permitted under US tax codes. Ignoring for the moment overstatement of standard and itemized deductions, the extent of the understatement of AGI represents the major source of the erosion of the tax base [illegible] evasion. The term 'underground economy' when applied to the concept of fiscal income refers to the underreporting of income which is legally reportable for tax purposes. This concept is of critical importance to policy issues in public finance. To the extent that AGI constitutes the empirical basis for the determination of the effective personal income tax base for the United States, underreporting of AGI has direct implications for revenue losses due to the fiscal 'underground economy', and concomitant implications for the size of observed government deficits (11).

The extent of the understatement of Personal Income (PI), on the other hand, reflects the 'underground economy' when economic income is the focus of attention (12). I shall refer to the understatement of NIPA income measures as 'unrecorded income', and to the understatement of fiscal income measures as 'unreported income'. If 'unrecorded income' is large and changing over time, official NIPA statistics will give a misleading impression of the size and growth rates of total economic activity.

The empirical relationship between unreported income and unrecorded income, depends in considerable measure on the relationship between AGI and PI. (See Table 2) The Bureau of Economic Analysis (BEA) has prepared a reconciliation of PI and AGI for the period 1947-1981, which permits a comparison of the AGI figures reported by the Internal Revenue Service (AGI-IRS) with an estimate of AGI based on NIPA statistics (AGI-BEA). The reconciliation is achieved by estimating those components of PI which are not included in the AGI concept as well as those components of AGI which are not included in PI. By subtracting the former and adding the latter to measured PI, it is possible to derive BEA's estimate of AGI.

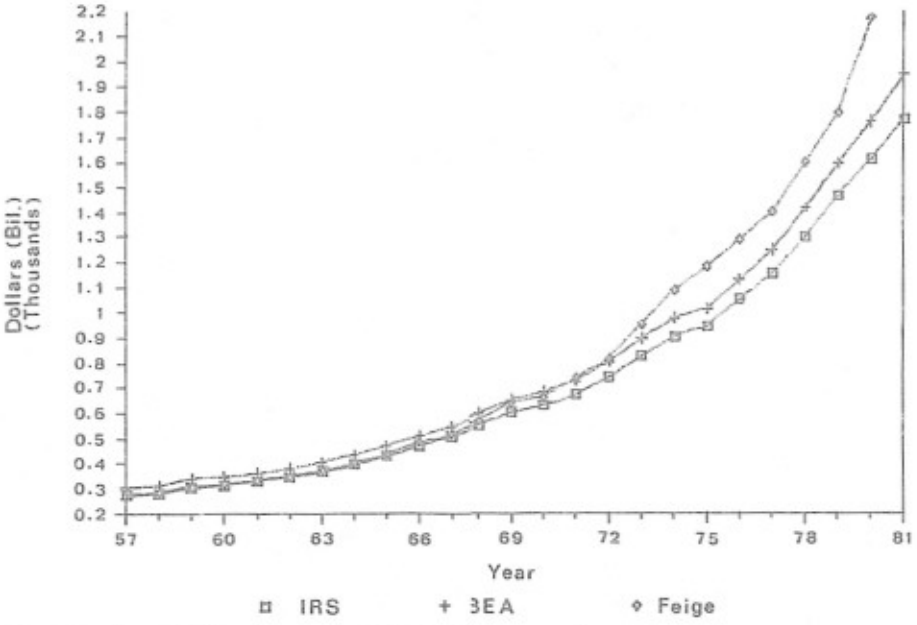

Figure 1: Estimates of adjusted gross income

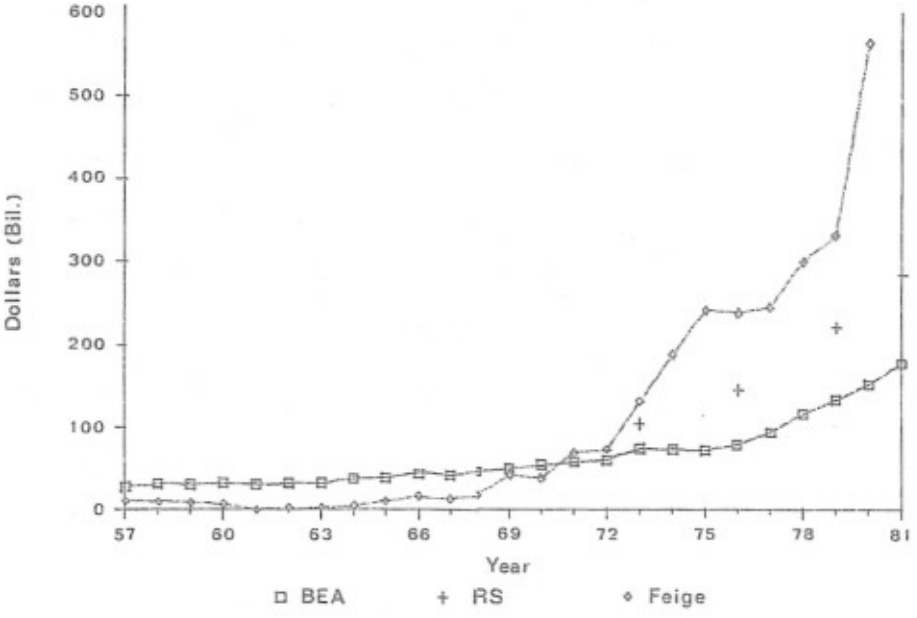

Figure 2: Estimates of unreported taxable income

Figure 1 displays three measures of AGI. The lower curve (IRS) displays the AGI as reported to the IRS. The middle curve (BEA) displays the BEA estimate of AGI based on the method described above, and the upper curve displays an estimate of AGI based on Feige's transaction method (13).

The vertical distance between BEA's estimate of AGI and the IRS reported AGI represents one measure of non-compliance with fiscal codes. This measure is commonly known as the AGI gap. The vertical distance between the transactions estimate of AGI and the IRS AGI represents a conceptually comparable estimate of non-compliance based on the transactions method. Figure 2 presents these two estimates of unreported fiscal income along with a new set of estimates of unreported fiscal income provided by the IRS.

Table 3 presents the values of the alternative estimates of unreported fiscal income for selected years. Column (1) displays the BEA estimates of the AGI gap; column (2) shows the IRS estimates of total unreported income and the final column represents the transactions method estimate of unreported income.

Table 3

Alternative estimates of unreported fiscal income in billion of dollars

Year	(1) BEA-AGI Gap	(2) IRS-Unreported Income	(3) Feige-Unreported Income
1973	74.3	103.2	130.6
1976	78.2	144.9	237.4
1979	132.6	220.3	330.7
1980	142.0	252.1*	563.5
1981	176.9	283.9	NA

(*) Interpolation from 1979 and 1981 estimates.

As is discussed below, it must be noted that both the BEA estimates and the IRS estimates for the year 1979 and thereafter are 'projections' based on data for 1973 and 1976. For the latter years, no new information is incorporated in the projections. Thus if one is to compare trend growth in unreported incomes based on the different methods the only valid comparison is for the years 1973-1976. For these years, the BEA estimate suggest an average annual growth in unreported income of only 1.8 percent, whereas the IRS and transactions methods produce growth rates of 13.5 percent and 27.3 percent respectively. For the latter years, the transactions method estimates are the only estimates based on new data and these suggest that unrecorded income grew at an average annual rate of 34.3 percent between 1976 and 1980. Had the IRS 'projections' been based on the growth

rates implied by the transactions method, rather than on the growth rates that prevailed in the early 1970's, their estimate of unreported income for 1980 would have been $343.9 billion rather than the $252.1 reported in Table 3.

In light of the differences in magnitude between these estimates, and the ambiguities concerning their interpretation, it is necessary to review their derivation in greater detail and to further examine their conceptual congruence.

2.1. Bureau of Economic Analysis Estimates of Non-Compliance

The first approximate (14) estimate of non-compliance is the difference between BEA's estimate of AGI and the actual AGI reported to the IRS (the AGI gap). According to the original BEA description of this series, the 'AGI gap can be taken as evidence of non-compliance with the tax code with the following caveats' (15):

1) The AGI gap <u>overstates</u> actual non compliance because it is based on personal income estimates which already include some adjustments for misreporting on tax returns as well as the income earned by individuals whose income is so low that they are not required to file tax returns.
2) The AGI gap <u>understates</u> actual non compliance because no estimate is made for under reporting of capital gains income or illegal income.
3) The gap is affected by errors in the reconciliation items, errors in other source data used to estimate personal income and sampling errors in AGI.

In a recently published article on the Underground Economy (16) the BEA reiterates the foregoing caveats, but now characterizes the AGI gap as a 'misunderstood estimate', claiming:

> "Although it has been referred to as a measure of the underground economy because it is viewed as isolating the major part of underground income that is not reported on income tax returns, the AGI gap is not such a measure" (17).

How then are we to interpret the BEA's estimate of the AGI gap? The AGI gap can be considered a <u>conceptually appropriate</u> estimate of non-compliance (underreporting of AGI) once allowances are made for the overstatements and understatements listed as items (1) and (2) above. Its <u>empirical accuracy</u>, on the other hand, depends critically upon the degree to which personal income is itself adequately measured and the degree to which the reconciliation items are accurately measured.

With respect to the possible overstatements suggested by item (1) above, we know that in 1977, BEA adjusted personal income upward by $11.5 billion to allow for what they then thought was misreporting from tax information (18). In addition, the gap would be overstated to the degree that personal income estimates include income earned by individuals

who were not required to file tax returns. The IRS has estimated that, in 1976, the amount of unreported income of non-filers on which no tax was due amounted to $21.6 billion and in 1979 the estimate was placed at $32.7 billion (19). Linear extrapolation between these years suggests a figure of $27.1 for 1977. Thus, these sources together suggest that the AGI gap was overstated by some $38.6 billion.

The items leading to an understatement of the AGI gap include estimates of underreporting of capital gains and unreported illegal source income, neither of which is included in PI nor accounted for in the standard reconciliation items. On the basis of new IRS data (20), unreported capital gains for 1977 were approximately $13.1 billion and illegal sector income amounted to approximately $19.6 billion. Ignoring for the moment any illegal sector income which had been laundered into personal income, the net effects of the forgoing conceptual adjustments would be an overstatement of BEA's estimate of non-compliance of approximately $6 billion for 1977, or about 0.5 percent of reported AGI.

Having corrected for these conceptual departures from an appropriate non-compliance measure, any remaining flaws in the BEA estimate of non-compliance will be the result of errors in the reconciliation items and the extent to which personal income itself is underestimated due to its exclusion of unrecorded economic income. The direction and nature of errors in reconciliation items is unknown but given the magnitudes of these items, even small percentage errors could significantly reduce the accuracy of the BEA's non-compliance measure.

2.2. Internal Revenue Service estimates of unreported income

In 1979, the IRS publicly admitted that unreported fiscal income had attained significant proportions (21). It revealed that underreported legal source income amounted to $74.9 billion in 1976 (22). Four years later (23), the IRS revised its original estimate to $131.5 billion, almost double the initial figure.

The updated study, moreover, estimated that by 1981, total unreported income had reached $284 billion, an amount approaching 75 percent of the entire GNP of the United Kingdom. For that year, the number of non-filers was estimated to have exceeded 6.2 million individuals with a total income in excess of $115 billion. Unreported legal source income for filers of tax returns was estimated to be $133.8 billion and an additional $34 billion of unreported income was attributed to the illegal sector.

The IRS characterized the method employed to obtain its estimates as a 'direct' approach, but even a casual perusal of their complex studies reveals that their methodology is anything but 'direct'. Indeed, the vast number of assumptions incorporated in their procedures makes an evaluation of their overall results extremely difficult. Several particular aspects of the IRS findings do however deserve special attention.

As will be developed below, there are strong reasons to

believe that even these significantly higher estimates still are contaminated with downward biases. These result, ironically, from the very 'indirectness' of their approach, one that requires literally hundreds of assumptions. Many of these assumptions are candidly discussed and justified, but at critical junctures in the research, subjective decisions are made which exert a highly conservative bias to their final estimates.

Earlier estimates of unreported income were based entirely on the IRS Taxpayer Compliance Measurement Program (TCMP) which involved intensive audits of some 50,000 tax returns included in a stratified sample. Aside from the importance of TCMP reports for determining the unreported income on tax returns, these same reports formed the basis for upward revisions of NIPA accounts in order to adjust the accounts for the inherent downward bias in tax-related source data. The virtual doubling of the earlier IRS estimate of unreported income was not based on new TCMP data, but rather was the result of an internal audit of the IRS's own auditing procedures. This audit produced the remarkable finding that the intensive TCMP audits found only 22 percent of unreported wage, salary, interest and dividend income for which separate information returns had been filed with the IRS. Thus, for these categories with relatively high information reporting coverage, the ratio of total covered unreported income to detected unreported income ranged from 4.25 to 5.0. Other categories revealed higher multipliers and of course lower information return coverage. In light of these findings, the IRS proceeded to estimate the total unreported income for filers by multiplying detected unreported income from the audit by a factor of only 3.5. Had a multiplier of 5.0 been used instead, the 1981 estimate of legal source unreported income of filers alone would have been raised by almost $ 95 billion dollars. Similar conservative judgements affected the estimates of non-filers' unreported incomes. Having estimated the number of non-filers using a complex matching procedure between Social Security data, survey data and individual IRS tax records (24), the incomes of non-filers were estimated by assuming that individuals fully reported their incomes in the household survey. It is well known that the non-response rate on these income questions is very high, and that tax evaders are likely to be highly represented in the non-response categories. Moreover, to the extent that tax evaders are among the respondent group, it seems implausible to assume that they will correctly report the incomes which they have hidden from the tax authorities to survey interviewers. The report admits that:

> "a suspicion lingers that people may be inclined to be more reticent about the incomes they earn 'on the side' than their earnings from other sources. To the extent such incomes were not reported during the household surveys ... the estimates ... are downward biased and understate the true amount of nonfilers incomes" (IRS, 1983, p. 75).

If one accepts, for the moment, the point estimates of the IRS for 1973 and 1976 (the only years for which complete data were available), it is still necessary to examine the time trends of non-compliance. The IRS study indicates that:

> "trends in noncompliance with tax laws may be at least as significant as the amount and pattern of noncompliance existing at any given time ... The estimates prepared for this report represent the most comprehensive attempt made to date by IRS to assess trends in noncompliance with US tax law" (25).

The estimates presented for 1979 and 1981 form the basis for the IRS's concern over the growth in unreported income (see Figure 2 and Table 3), yet they are not based on any additional data collected for those years. According to the IRS report, "these estimates show the approximate levels noncompliance would have reached by 1979 and 1981 had past trends in these variables continued" (p. 7). A closer examination of the IRS projections for the latter years reveals that the agency actually chose to ignore 'past trends' which suggested that "adjusted gross income (AGI) per non-filer ... had increased at an extraordinary pace, from $6,826 in 1972 to $12,036 in 1977" (p. 83). Rather than incorporate these findings into its projections for latter years, the IRS simply ignored its own data with the rationale:

> "This surprising situation led to speculation that perhaps the unusual growth of non-filer incomes was at least in part due to limitations of the estimation method used, rather than any fundamental change in the types of persons electing not to file individual income tax returns. Until further data are developed on the non-filer problem, therefore, it seemed more prudent to consider part of the unusual increase in average non-filers incomes between 1972 and 1977 to be suspect. Consequently, while the growth of non-filers income from 1973 to 1976 was assumed to have proceeded at the estimated rate of growth from 1972 to 1977, this rapid pace was moderated in deriving projections for 1979 and 1981" (p. 83).

One justification for focusing on so called 'direct' methods was that the resulting estimates could be "decomposed into separate elements that must be individually analysed for effective monitoring of compliance with the tax laws" (p. 42). As a means of providing a 'validity check' on its own estimates, the IRS turned to BEA data which itself is deeply based in tax related sources. According to the report:

> "It was important, therefore, to compare these estimates with alternative measures based on data from sources external to the IRS. In order to have a valid comparison, however, the alternative measures could not be conjectural or based on financial ratios not sufficiently stable to yield reliable estimates of unrepor-

ted income .... The only external source of data that came close to yielding the needed yardsticks with which to evaluate the non-compliance estimates prepared for this report was found at the BEA" (p. 135).

The results of the 'validity check' are characterized as follows:

"It is noteworthy, that often, but not always, the discrepancy in the BEA-IRS reconciliation tables shows substantial confirmation of the IRS income gap estimates" (p. 152).

On closer scrutiny, these reconciliation tables reveal that although overall discrepancies might be characterized as bearing out 'substantial confirmation', this result depends entirely on the fortuitous offsetting of major discrepancies in individual items.

As displayed in Table 4, the BEA estimate of unreported wages and salaries is approximately half of the IRS estimate, whereas its unreported interest figure (26) is more than 2.5 times the IRS estimate (p. 137).

In light of the foregoing examples, it is difficult to escape several key conclusions regarding the IRS results:

1) The novelty of the new IRS study stems from its acknowledgement that earlier estimates of non-compliance based directly on intensive audit findings represented gross underestimates of unreported incomes, since the audit procedures uncovered less than 25 percent of the unreported income which could be independently documented by information returns.

Table 4

Percentage discrepancies between BEA and IRS estimates of unreported income components
1 9 7 9

Income Source	Percent Discrepancy*
Wages and Salaries	- 51.90
Farm Propietor Income	35.78
Nonfarm Proprietor and Partnership	8.19
Interest	173.39
Dividends	128.57
Rents and Royalties	134.62
Pensions	15.87
Other Income	- 9.33
TOTAL	3.40

(*) The percent discrepancy is calculated as (BEA - IRS) / IRS x 100.

2) Even the new estimates of unreported income are likely to be gross underestimates because a lower multiplier was used for adjustment than was suggested by the IRS's own findings. Similarly, unreported incomes of non-filers are based on survey data which take no account of self selection biases among both respondents and non-respondents.

3) The IRS estimates of the trends in non-compliance are not based on any new information beyond 1976. Moreover, the projections estimated for 1979 and 1981 ignore information which was available to the IRS on non-filer incomes. Incorporating this information would have raised estimated non-compliance in subsequent periods.

4) An examination of separate sources of non-compliance reveals major discrepancies between the IRS findings and existing BEA estimates.

Although the IRS study candidly admits these inadequacies in its methods, it continues to assert, rather than demonstrate, that:

> "Despite their limitations, direct methods of estimation relying on survey data and administrative records are believed to be superior to the indirect methods others have used" (p. 26).

The above-mentioned limitations of the IRS approach are of considerable importance, since it is the IRS estimates of unreported income which provide the basis for the current revisions of the NIPA accounts. A recently released report (27) reveals that the BEA has now incorporated an improved adjustment for tax source misreporting in 1977 amounting to $81.5 billion for charges against GNP and $69.3 billion dollar improved adjustment for Personal Income. To the extent that the IRS estimates are too low, similarly, the BEA adjustments for unrecorded income will be too low. Moreover, the BEA plans to extrapolate its tax source misreporting adjustments for the post-1977 period on the basis of the assumption that the proportion of unreported income remains constant. In light of the foregoing discussion, such a procedure will understate unrecorded income for all subsequent years because the proportions used for extrapolation will be based on an underestimate of unreported income. Moreover, the procedure will take no account of the growth in the proportion of unreported incomes revealed by both the IRS estimates and the transaction estimates.

3. THE CONSEQUENCES OF UNREPORTED INCOME ESTIMATES FOR BUDGET DEFICITS

In many Western economies, budget deficits have risen to unprecedented heights, stimulating demands for higher taxes and substantial cutbacks in social programs. In the United

States, the annual budget deficit averaged $0.5 billion in the decade of the 1950's, $5.7 billion in the 1960's, $30.2 billion in the 1970's, and $109 billion in the early 1980's. Estimated US budget deficits for the mid 1980's are in excess of $200 billion. This growth of government deficits has stimulated considerable controversy concerning the measurement, interpretation and implications of sizable deficits. These issues are intimately connected with the growth of unreported fiscal income.

The introduction of Keynesian economics, with its emphasis on the consequences of fiscal policy for macroeconomic activity, focused attention on the impact of government budgets on economic fluctuations. By 1947, it was acknowledged that the actual government surplus or deficit was a poor indicator of the thrust of discretionary fiscal policy, since the actual budget reflected both the automatic responses of revenues and expenditures to cyclical fluctuations in the economy and discretionary changes in fiscal policy (28). In order to develop a more refined measure of discretionary fiscal policy, free of cyclical influences on the budget, the question was posed, "What would be the size of the government budget if the economy were at full employment?". The answer to this question was the development of the 'full employment' or 'cyclically adjusted' budget, which reflected the 'structural' or discretionary component of the budget (29). Partitioning the actual budget into its cyclical and structural components remains a complex problem of measurement (30) but there is no longer any controversy about the importance of making this conceptual distinction.

The apparent growth of the 'underground economy' raises a new and potentially equally significant issue, namely, "What would be the size of the government budget if there were full compliance with tax regulations and social expenditure programs?". The answer to this counterfactual question is provided by the concept of the 'full compliance' budget (31).

Given estimates of unreported taxable income, it is possible to construct rough estimates of the 'tax gap', namely, the loss of tax revenue due to underreporting of taxable income. One of the most useful aspects of the recent IRS report is its attempt to construct estimates of the 'tax gap'. The IRS report calculates separate components of the tax gap based on their estimates of unreported income as well as from audit data on overstated business expenses and deductions. Since the report yields separate estimates of unreported income of filers and non-filers, it uses different average marginal tax rates to access the tax losses implied for different income source category. To the extent that the separate income source categories are misspecified (See Table 4) the tax losses will also be in error (32). Table 5 presents estimates of the tax gap for the years 1979 and 1980 derived from the IRS report, and roughly comparable estimates of the tax gap based on the transaction method estimates of unreported income.

Table 5

Alternative estimates of tax gaps and
the full compliance deficit
in billions of dollars

1979-1980

Tax Gap Source	IRS-79(1)	TRANS-79	IRS-80(2)	TRANS-80
Unreported Legal Income				
Filer	38.4	60.2	52.2	108.6
Non-Filer	2.0	3.1	2.9	5.3
Illegal	6.3	6.3	7.7	7.7
Corporate Gap	6.4	6.4	6.3	6.3
Business Expenses	4.7	4.7	5.5	5.5
Overstated Deductions	5.0	5.0	5.8	5.8
Net error	0.5	0.5	0.5	0.5
Remittance Gap	5.3	5.3	6.1	6.1
Total Tax Gap	68.6	91.5	87.0	145.8
Actual Deficit	- 14.8	- 14.8	- 61.2	- 61.2
F.C. Deficit	+ 53.8	+ 76.7	+ 25.8	+ 84.6

(1) From Internal Tax Compliance Research.

(2) Estimates based on Taxpayer Information File 1979 and 1981

Although the transaction method only produces estimates of total unreported income, the component estimates from the IRS study can be used to decompose total unreported income into unreported illegal income, and filer and non-filer unreported income (33). By applying the same tax rates used by the IRS, it is possible to make a comparison between the IRS tax gap estimates and those estimated from the transactions methods. For 1979, the transaction methods yields a tax gap that is $22.5 billion above that estimated by the IRS. For 1980, the difference amounts to $58.8 billion (34).

Table 5 also displays the corresponding values of the 'full compliance deficit' (F.C.) assuming that social fraud is zero. The substantial budget deficit of 1980 would have become a sizable surplus, had there been full compliance with the tax code. These results suggest that a tax reform which lowers rates, simplifies the tax code and reestablishes the perception that there are no free riders in tax matters, may be the most hopeful solution for the massive deficits which currently threaten the stability of economies throughout the world.

4. SUMMARY AND CONCLUSIONS

In order to gain a clearer perspective on the measurement and implications of the growth in the 'underground economy', an essential first step is the development of an appropriate taxonomic framework which clarifies the distinction between various concepts of 'underground' activity. When the primary concern is the measurement of economic activity, total economic income is the appropriate concept, and its conponents, recorded and unrecorded income, reflect the differences between conventional measures and those which properly account for the effects of the growth of the 'underground economy'. When the primary concern is with the public finance implications of the underground economy, the appropriate concept is fiscal income and its components, reported and unreported income. Recorded economic income is empirically reflected in measures of personal income, whereas reported fiscal income is reflected in measures of adjusted gross income, and these two different concepts can be empirically reconciled on the basis of available data sources. Estimates of unrecorded income reflect the extent to which current national income accounting procedures are defective in their omission of an important segment of economic activity, whereas estimates of unreported income are required in order to correctly assess the implications of non-compliance with existing fiscal legislation.

Although there remains considerable controversy about the size and growth of both unrecorded and unreported incomes, governmental agencies in the United States have responded to the issues raised by academic researchers and have conducted their own major research projects to determine the extent and significance of underground activities. These new findings reveal that both unrecorded and unreported incomes are much greater than had previously thought to have been the

case, and they confirm the primary assertions of earlier studies that the underground economy has exhibited considerable growth during the 1970's and 1980's.

The spectacular growth of government deficits, and the controversy surrounding their macroeconomic consequences, stimulates the need to extend the insights of 'underground economics' to the domain of federal budget analysis. The concept of the full compliance deficit enables us to distinguish between structural, cyclical and noncompliance budget components, and leads to a new perspective on the intended and unintended consequences of discretionary fiscal policy. Further research is required to determine the cyclical patterns of unrecorded and unreported incomes so that current measures of the high employment budget can be appropriately modified in order to eliminate biases introduced by the fluctuations in the underground economy.

Given the magnitude of current estimates of the tax gap and the additional non-compliance component of social fraud, it appears that political concerns about the size of deficits might well be directed toward the study of major fiscal reform programs aimed at the reestablishment of voluntary high levels of compliance with fiscal regulations. Higher tax rates and reduced social expenditures appear on the surface to be the most expeditious manner of reducing deficits. However, the unintended consequence of such policies is to stimulate further underground activity, thus thwarting efforts to reduce deficits. The alternative policy prescription is to simplify the tax system in order to make it both more comprehensible and equitable, and to reduce marginal tax rates with base broadening, in order to reduce economic incentives for non-compliance. Only when tax laws are perceived as being equitable and universally administered are we likely to see a reversal of the trends toward greater noncompliance.

NOTES

(1) The author gratefully acknowledges research support from the Alfred P. Sloan Foundation.

(2) See Feige (1980), Feige and McGee (1985).

(3) Feige (1984).

(4) Murphy (1981).

(5) Skolka (1981).

(6) Smith, Moyer and Trzcinski (1982).

(7) UN (1953).

(8) Recorded income can be measured with different degrees of 'grossness', thus giving rise to distinctions between GNP and NNP. Estimates of national income are derived from NNP by subtracting indirect tax and nontax liabilities, business transfer payments, and the statistical discrepancy, and by adding subsidies less the current surplus of government enterprises. Finally, personal income is derived from national income by subtracting corporate profits with inventory valuation and capital consumption adjustments, net interest,

contributions for social insurance, and wage accruals less disbursements, and by adding government transfer payments to persons, personal interest income, personal dividend income, and business transfer payments.

(9) The Bureau of Economic Analysis makes imputations for food produced and consumed on farms and also includes imputations for non-monetary transactions such as rent for owner-occupied housing.

(10) An example would be food grown and consumed on a farm which is excluded from fiscal income under US tax law, but is considered to be a segment of total economic income for which NIPA imputations are undertaken.

(11) Feige (1985).

(12) Personal Income represents one of the major components in the construction of the broader measure of economic activity, namely GNP. We focus our discussion on personal income, because it is, to date, the only NIPA concept for which it is possible to derive a direct empirical relationship to empirical measures of fiscal income, eg. AGI.

(13) The IRS and BEA measures are reported in the Survey of Current Business, November 1981 and July 1982. The transactions method estimates of AGI are based on the relationship between adjusted total transactions and reported AGI. The transactions method is described in Feige (1980).

(14) The estimate is approximate due to some conceptual departures from a pure non-compliance measure and due to various errors in both the reconciliation items and errors in other source data used to estimate personal income.

(15) See BEA (1981).

(16) Carson (1984).

(17) It is not surprising that the BEA would disavow the AGI gap as a measure of the 'underground economy' since it characterizes the underground economy as: "economic activities - or income from those activities - that elude, wholly or partly, a tax or other reporting requirement. As the focus moves to measurement, such a characterization is not specific enough to be useful". (See Carson, (1984), p. 24).

(18) Parker (1984).

(19) See IRS (1983), pp. 78-79.

(20) Derived from IRS (1983), p. 9 and p. 39 with linear interpolation between benchmark years.

(21) IRS (1979).

(22) These initial findings were criticized as containing serious downward biases. See Feige (1980).

(23) IRS (1983).

(24) In describing its efforts to identify non-filers using match techniques between different data sources, the report indicates "such indirect means of identifying potential non-filers were necessary because the IRS does not maintain lists of individuals who do not file tax returns." IRS (1983) (p. 71)

(25) IRS (1983), p. 7.

(26) The IRS states that "Care has also been taken to state all of the assumptions, together with enough background figures to permit the interested reader to make alternative estimates using the same data but with different assumptions" (p. 1). However, once the interested reader delves more deeply into the report, he encounters some difficulty in assessing the reliability of the reported results. For example, in discussing the unreported income reconciliations, the report states, "some of the BEA estimates are based on indirect procedures that raise questions about their potential use in estimating non-compliance. To cite an extreme example, 63 data sources were required to prepare estimates of the unexplained portion of the gap between BEA and IRS data for personal interest income" IRS (1983), (p. 136).

(27) Parker (1984).

(28) CED (1947).

(29) SCB (1980), (1982).

(30) De Leeuw and Holloway (1983).

(31) Feige (1985).

(32) The IRS applied an overall average marginal tax rate of 39% to its estimate of unreported income for filers, and an effective overall average tax rate of 2.3% on total unreported income of non-filers for its 1981 estimate.

(33) The IRS estimate of illegal source income was subtracted from total unreported income, and the residual 'legal' component was then allocated between filer and non-filer unreported income on the basis of the proportions estimated in the IRS report.

(34) When the tax gap is estimated by simply applying Barro's estimate of the average effective marginal tax rate to total unreported income, the differences between the IRS tax gap and the transaction method tax gap becomes $27.3 billion for 1979 and $82.0 billion for 1980. See Feige (1985).

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