THE MACROECONOMIC ESTIMATES OF THE HIDDEN ECONOMY: A CRITICAL ANALYSIS*

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GENERAL INTRODUCTION

The underground economy has reached such a size, in everyday life and in economic literature, that a close examination of its real importance would be particularly useful. If we go beyond spectacular estimations which only excite the imagination and draw attention to economic agents whose function is to legislate or to put economic policy in its right place, we are forced to accept that macroeconomic evaluations are highly heterogeneous. This heterogeneity is on two levels: on the one hand the methods used are very different; on the other hand, the results obtained are most contradictory. For a single country, in the course of a single year, it is not rare to observe estimations which oscillate between 3 percent and 33 percent of the official GDP. All this leaves the researcher rather wary, all the more so because the approaches which lead to these varying results are based, to varying degrees, on proven economic theories. In this context, a critical analysis of the macroeconomic estimates of the size of the underground economy takes on a special interest. This is the main object of this article.

To do this properly, our approach will be in two phases. In the first stage (S.1) we will look critically at the most current quantification methods. We will be less concerned with the results obtained than with the methods used to measure them. In the second stage (S.2), the numerical evaluations will be important, and the review will be concerned with two main points.

First, we will present an exposition and explanation of the considerable differences which correspond to a stable hierarchy and appear among the results based on different methods. These differences are observed in all countries where different generic approaches are used. Second, we will consider the signs and/or the proofs which persuade observers to think that underground activity continues to grow.

With this double perspective, we will review both the methods (S.1), and the results (S.2). An effort to go beyond the current traditional approaches will be suggested in the conclusion.

S.1. A CRITICAL ANALYSIS OF THE METHODS

We have no intention of making a complete inventory of all the methods used to measure the underground economy. Such a record would be of no great interest because these techniques of estimations can be grouped together into a

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dozen specific approaches. It is these, and not the numerous variants that they give rise to, which will be the object for review.

We will start with approaches which use monetary variables to analyze those which are based on the labor market. The approaches which refer specifically to national accounting will be studied in the third part and a discussion of an approach with a composite base will conclude this section of the analysis.

A. *Monetary Approaches*

For the purposes of this paper, we will call all methods based on the utilization of monetary data, monetary approaches. The idea common to these approaches is to analyze the development of monetary variables and to infer that the anomalies noted in the behavior of these variables is due to the underground economy. The three approaches chosen here are those used by Feige,[1] Gutmann[2] and Tanzi.[3] We take the liberty of not developing these methods in any detail, except where a certain aspect is necessary to understand the analyzes.

a) The Feige Method

Feige's method is based on the quantitative theory of money as developed by Irving Fisher: $MV + M'V' = \text{PT}$.

M and M' represent notes and demand deposits respectively, V and V' the transaction-velocity of M and M', and PT the product of the amount of transactions T by the general price level P.

As a first step, Feige determines M, M', V and V' and from this deduces a theoretical PT. This PT is then confronted with a ratio PT/GDP used as a reference, and an estimation of the underground economy is deduced from this confrontation. Knowing M and M' presents no major difficulty; available statistics cannot be questioned *a priori*. The method for calculating V is presented in detail by Feige. V is determined from purely physical phenomena. The number of times that a note circulates in the economy is calculated by knowing a stock and flow. The stock is the volume of currency in circulation and the flow the number of denominations withdrawn, because of material deterioration, and reintroduced each year. Hence, V is determined independently of PT.

However, Feige indicates that calculating V' presents "no empirical problem," since this velocity has been regularly published in the U.S. since 1919. Now, do we need PT or GDP in order to calculate V? If the answer is "no," the criticism is of little interest. It is limited to an overestimation of the underground economy, for it is worth noting that a non-negligible number of dollars is held outside the U.S. If, however, the answer is "yes," there is no independence between V' and PT and we come up against the same sort of criticism used in 1953 by Mrs Robinson against the neo-classical theory for measuring capital. We have to know the stock of capital to know the interest rate, and the interest rate

[1]Edgar L. Feige; "How Big is the Irregular Economy?," *Challenge*, November-December 1979.

[2]Peter M. Gutmann; "The Subterranean Economy," *Financial Analysts Journal*, November-December 1977.

[3]Vito Tanzi; "The Underground Economy in the United States: Estimates and Implications," *Banca Nazionale del Lavoro—Quarterly Review*, December 1980.

to evaluate the stock of capital. The argument goes round in a vicious circle in this context, if V' were known by PT (or a part of PT).

The velocity of money, quite independent of the possible pertinence of the criticism above, is the object of many specific studies. Analyzing this variable in the U.S. (Feige's first estimations were from this country) shows on the one hand that there are numerous determinants and on the other hand that behavior is far from uniform. Fisher himself underlined the many economic and social factors which might explain it.

At an empirical level, the velocity of M_1 increased, with very few fluctuations from 1959 to 1981, to an average rate of increase of 3.2 percent. In 1982 there was a decrease of 2.3 percent.[4] To the specific explanations for the slowing down of the velocity—a decline in the rate of inflation, a fall in the interest rate which reduces the opportunity cost of holding money—we can add the explanation that the velocity would decline during the periods of recession. For example, Milton Friedman develops a theory of nominal income in which the velocity changes in the same direction as income (procyclical). This argument is based on a gap between observed income and permanent income.[5]

Since in Feige's approach V and V' are essential for knowing PT, any special behavior of these variables destabilizes the calculated ratio PT/GDP and consequently biases the estimation of the underground economy, which in the extreme, will be greater when growth is rapid, and weaker when growth is slow. Feige's estimations, and this is true for the other monetary approaches, depend largely on the basic year chosen. In his approach, for example, the ratio PT/GDP in 1939 is assumed to reflect an economy with no underground activity. Even if prohibition ended and the war were not yet started it would be impossible to infer that there were no hidden activities in 1939. So, all these evaluations which are supplied must be added to the underground economy present at the time of the basic year.

b) Gutmann's Method

It seems to us that Gutmann's method, which is based on an appraisal of the ratio C/D where C is currency and D demand deposits, can be criticized from several points of view. In the first place, the estimations depend on the basic year chosen. Even if the author chooses an average between 1937 and 1941 for his basic year (cf: previous analysis), there is nothing to say that with a different base, the conclusions would be of the same order. Moreover, everything seems to prove the contrary, as was clearly illustrated in the case of the United Kingdom by Dilnot and Morris.[6]

The second criticism is the choice of the ratio C/D. Though the ratio lies in the neighborhood of 25 percent in the U.S.A. since the end of the thirties (except for some fluctuations recorded by Gutmann), the norm of the development

[4]John A. Tatom, "Was the 1982 Velocity Decline Unusual?," *FRB of Saint-Louis Review*. Vol. 65, No. 7, August-September 1983.

[5]Milton Friedman, "A Theoretical Framework for Monetary Analysis," in Robert J. Gordon ed., *Milton Friedman's Monetary Framework*, University of Chicago Press, Chicago, 1974.

[6]A. Dilnot and C. N. Morris: "What do we know about the Black Economy?, *Fiscal Studies*, March 1981. See in particular Table 1, p. 62.

is far from being stationary in almost all of the other developed countries. In the case of France, in particular, the ratio C/D has developed as follows:

	1945	1950	1955	1960	1965	1970	1975	1980
C/D	1.33	1.05	0.95	0.72	0.59	0.48	0.33	0.25

This decreasing trend is due to several things: the rise in real income; the rural depopulation; monthly wage payments becoming more widespread; efforts undertaken by banks to increase the number of accounts; paying wages and salaries by cheques or transfers, etc. In this context, it would be a good time to explain the fall in this ratio. The underground economy calculated by Gutmann's method would make sense only by adjusting the deviations in the decreasing trend which are not explained by known variables.

It seems that in the U.S.A. as well as in Europe, it is possible to forecast the value of C and D with a high degree of accuracy by using only legal variables in the forecasting models. This is the sense of Garcia's criticism of Gutmann's method.[7] Unquestionably it would appear that Gutmann's approach is too summary, however, we should not ignore the question of the notes in circulation.

For example, in France, Dauvisis and Pincon[8] had to add an employment variable to the usual variables in their study. The authors end their article by saying that payments in cash increase in periods of economic slow down (doubtless because of concealed labor).

Additional criticism can be levelled at Gutmann's method, and also at Tanzi's. Once theoretical C (C^*) has been defined and observed $C(C)$ has been recorded, it is the product of $(C - C^*)$ by the velocity of money V, which gives us an idea of the importance of the underground economy. The assumption generally adopted about V is that the velocity in the official economy is exactly the same as that in the unofficial economy. *A priori*, there is no way of operating this assimilation. In fact, unofficial V may be more rapid if we consider that agents in the underground economy spend their hidden income quickly by buying durable or semi-durable consumer goods. But conversely, we can just as well consider that unofficial V is slower than official V, since black incomes are hidden for a certain period, before being spent—for reasons which the reader will understand.

It is difficult to establish the balance between the wish to spend dirty money quickly and the desire to spend it later and with decency. To assume that both alternatives are equally weighted and that official V and unofficial V are equal is therefore not a theoretically satisfying solution.

c) Tanzi's Method

The criticisms of the reference years and the velocity of money can be dealt with by Tanzi's method, and to all those which are derived from it. To show the

[7]Gillian Garcia: "The Currency Ratio and the Subterranean Economy," *Financial Analysts Journal*, November-December 1978.

[8]J. F. Dauvisis and R. Pincon: "Etude économétrique de la part des billets dans les disponibilités monétaires," *Cahiers Economiques et Monétaires*, Banque de France, No. 5, 1977.

importance of these criticisms we shall borrow the following illustration from Klovland, about the subterranean economy in Sweden in 1982, expressed as a percent of the official GDP.[9] The three variants referred to come from the different variables introduced in the estimation procedure. In fact, we know that this method is based on an econometric estimation of an expression like:

$$\frac{C}{M} = f(\cdot, \cdot, T)$$

where C/M is the ratio of currency to a monetary aggregate and T a tax variable.

An Estimation of the Hidden Economy as a Percent of the GDP

Variants	$V=2$	$V=3$	$V=5$	$V=7$
1	3.0	4.5	7.5	10.6
2	4.6	6.9	11.5	16.0
3	5.6	8.5	14.1	19.7

For the same equation tested, the assumption chosen concerning the velocity of money changes the estimation of the hidden economy quite considerably.

The theoretical foundation is certainly one of the trumps of Tanzi's method. Based on the original version of Cagan's model and on the theory of portfolio choice in the more elaborate versions, it is not likely to be accused of being summary as is Gutmann's method.[10,11] On the other hand, it could be vulnerable to a criticism regarding the change in agents' behavior when there is increased tax pressure. In fact, the subterranean economy is measured in the following way, let

$$C_t^* = e^{(\alpha z_t + \beta T_t)}$$

where C_t^* is the estimated value of the currency for the year t. Z_t represents all the explanatory variables of C_t^* except T_t, the tax variable. α is a vector and β a coefficient. Let

$$C_t^0 = e^{(\alpha Z_t + \beta T_0)}$$

where C_t^0 is the calculated value of the currency for the year t, assuming that the tax variable T remains at the lowest level recorded during the period of estimation, (that is T_0), and that the other explanatory variables keep their observed values Z_t.

The hidden economy is thus calculated by multiplying $(C_t^* - C_t^0)$ by V_t. Even if the relationship between C/M and T is not affected by the rise in taxation, the exercise of comparing them still makes good sense. However, if agents alter their behavior as to money-holding because of increased tax pressure,

[9]Jan Tore Klovland: "Tax Evasion and the Demand for Currency in Norway and Sweden. Is There a Hidden Relationship?," *Scandinavian Journal of Economics*, Vol 86, No. 4, 1984, p. 436.

[10]Phillip Cagan, "The Demand for Currency Relative to the Total Money Supply," *Journal of Political Economy*, Vol. 66, No. 4, August 1958.

[11]K. G. P. Mattews, "Demand for Currency and the Black Economy in the U.K.," *Journal of Economic Studies*, Vol. 9, 1982.

just writing C_t^0 removes all interest in the analysis. If nothing is changed, apart from tax pressure, it is enough to observe the gradual increase in the rate of the tax and social security burden to assume that the subterranean economy is developing.

Before completing this critical examination of monetary approaches, mention should be made of an indirect empirical approach based on the increase of large denominations in circulation. This method consists of observing if the cash in notes held by non-financial agents rises rapidly or not.

There are in fact many criticisms which can be aimed at this method. In the first place, the increase in prices and in the cost of living produces an increase of cash held in large denominations. In the second place, it should be established that the denominations are not, by nature, divisible. If they are, it is probable that, all other things being equal, the number of notes in circulation will rise at the same rate as the cost of living. In the third place, it is not unrealistic to assume that hidden transactions are settled using large denominations as well as by small ones. Finally, large notes are hoarded in all countries, whereas small denominations are used for current transactions. The "small denominations expel the large," one might say in parody of Gresham's law.

Though monetary methods are the ones most often used, the macroeconomic estimation of the hidden economy also uses methods which rely on anomalies observed in the labor market.

B. *Labor Market Methods*

Whereas the monetary approaches were by nature indirect, the labor market approaches are more direct since they are based on surveys of real or potential agents of the hidden economy.

Even if the obstacles arising from the reticence of those questioned can be overcome through modern techniques of surveys and polls, there still remain two important difficulties. If the field of enquiry is restricted (one area or one trade over a limited geographical region), the results might be precise, but it will not be possible to extend them. If, on the other hand, the field of enquiry is wide enough, then the results may well be precise. To support this double argument, we need to analyze how the samples are constructed in the two types of survey.

The choice of the area to study in the case of a local survey is purely subjective and is usually concentrated around the zones where, *a priori*, there are many hidden activities. It is pure speculation to extend the result of this one group to cover the whole population.

With a wider sample, the experience of surveys conducted in several Scandinavian countries suggests that according to the answers, certain groups of the population are over-represented and that others are under-represented.[12] Even if a very widespread survey were undertaken, and the rate of non-answers reduced so that the conclusions were not changed, we would still not be able to estimate the hidden economy.

[12]Arne Jon Isachsen, Jan Tore Klovland, and Steiner Strom: "the Hidden Economy in Norway," in Vito Tanzi ed: *The Underground Economy in the US and Abroad*, Lexington Books, Lexington, Mass, 1982, p. 209 to 231.

In Italy, for example, the ISTAT modified the questionnaires on the active population in 1977 in order to show clandestine workers. Even though the active population increased to 1,552,000 nothing could be deduced as to the hidden economy. In fact, these surveys allow us to estimate the number of hidden workers, but not the hidden economy. To go from one to the other we need to estimate the productivity of hidden labor.

One can, with such a sound argument, assume that the productivity in the illegal sector is higher, or lower, than in the legal sector. If we consider that hidden workers work for their own gain, they could be prompted to produce even more than if they worked for a boss. This is another way of saying "Charity begins at home." On the other hand, it is not without foundation to assume that, with the addition of a declared job, the productivity of hidden workers is lower than that of official workers.

In making the parallel between the apparent productivity of labor and the velocity of money, the estimates of the hidden economy are, at the very least, subject to a great deal of uncertainty. Consequently, it is a questionable assumption to suppose that labor productivity is the same in both official and unofficial sectors.

The first Italian authors to have attempted to estimate the hidden economy took the rate of activity as an indicator.[13] At the beginning of the 1970s in Italy the rate of activity was around 35 percent, whereas it was between 40 and 44 percent in other Western countries. Even if such a gap were suspicious, which was confirmed by later ISTAT surveys, this single empirical proof would not be enough to infer a measurement of the hidden economy.[14] Certainly we come up against the development of labor productivity, but also against our incapacity to isolate what is structural or sociological in these relationships and their development. We know, for example, that in Latin countries, the working day is longer than in Northern countries, but there are relatively few women workers and absenteeism is higher.

Certainly there are links between social data and data about the hidden economy, but to infer measurements from them is pure speculation. We also ought to abandon these labor market approaches in order to examine those which provide the bare bones of national accounts.

C. *Accounting Methods*

For a long time, and in all countries national accountants have had to resort to iterative procedures to make up the gap between the GDP (point of view expense) and the GDP (point of view income): the estimates of expense, before corrections, being always higher than those of income. They have also become used to integrating into their accounts a whole set of hidden incomes, especially those concerning tax evasion.

[13]For example, Giorgio Fua: *Occupazione e capacita produttive: la realta Italiana*, Il Mulino, 1976.

[14]In this connection we should mention that the ISTAT has just initiated a considerable enlargement aimed at correcting the size of the Italian GDP. The results, published at the beginning of 1987 show an increase in GDP of more that 15 percent. A significant part of this revision can be attributed to taking better account of the hidden economy.

Just to illustrate this, VAT fraud is detected regularly in France by the INSEE, through the method of difference in VAT. To begin with, we calculate the amount of VAT actually received by the state. Then we determine the amount of VAT which theoretically should be received, taking into account the economic activity as it is understood by the different headings in the input-output tables. The difference between the theoretical VAT and the actual VAT makes a VAT gap which is enough, with some correction, to obtain some estimation of evasion. The correction is based on legal exemptions and abatements and on the differences which arise from the legal rules for the paying in and the deduction of VAT.

Similar calculations can be made to obtain statistically any sort of fraud, to integrate a part of the income from hidden labor, to estimate the value of tips, etc. Just the fact that the GDP consists, in part, of incomes which undeniably come from the hidden economy means that in no case should we confuse hidden with unrecorded.[15] Estimations of the hidden economy based on national accounts regularly give lower estimations that those based on other information, simply because accounting approaches take into account the unrecorded hidden economy, whereas other approaches evaluate the turnover. However, this important observation is not enough on its own to summarize all the criticisms of accounting approaches. Two additional directions should be explored: the first concerns the role of conventions, the second refers more directly to the accounting methods of estimating the unrecorded economy.

The delicate question of conventions is at the heart of accounting approaches in that a convention plays exactly the same role as a record. There are in fact incomes or perfectly identified expenditures, not normally part of the investigation of national accounts, whereas at the same time, there are badly identified incomes and expenditures which conventionally arise from the area of analysis covered by the accounts A. Vanoli, for example, explored the relevant question of the fate of trading activities normally excluded from national accounts because of their illegal nature: smuggling, drug dealing, prostitution, etc.[16]

If national accounts have to record all economic acts without worrying about problems of normalizing them, activities of this type would eventually be recorded. Among the arguments in favor of this introduction is that these goods become useful to their users, that the value of the goods in question are often known, that we already record goods judged to be dangerous to health, such as alcohol or cigarettes.[17] We should, among other things, add that phenomena such as tax evasion or some portion of hidden labor are already taken into account, without raising any fundamental opposition. Moreover, in Italy, the trade of smuggled cigarettes has been recorded officially for several years.

To sum up, all it needs is for international conventions to develop in this or that direction for the hidden economy, quite mechanically, to increase or decrease. Enough for there to be suspicions about the current state of estimations.

[15]Philippe Barthelemy: "Comptabilité Nationale et Economie Souterraine," in Oleg Arkhipoff and Edith Archambault eds, *Etudes de Comptabilité Nationale*, Economica, Paris, 1985.

[16]André Vanoli: "Les tracés divers de la notion de production," *Economie et Statistiques*, September 1983.

[17]We are reminded of the famous controversy between J. B. Say and DuPont de Nemours about whether prostitution should be classified as one of the productive activities. J. B. Say replied positively to the questioning of DuPont de Nemours basing his argument on the theory of utility value.

All accounting approaches described above estimate the hidden economy to be in the range of 2 to 5 percent of the GDP depending on the country, the year or the techniques used. From our point of view, a common feature of all accounting methods seems to be the desire of the authors to protect (subject to the conventions) the legitimacy of the GDP figure that they, directly or indirectly, contribute to quantifying. Macafee, studying the national accounting of the U.K. insists on including in the accounts a large number of incomes derived from hidden sources.[18] Broesterhuizen shows that the possibility of making mistakes when building up Dutch national accounts is very small.[19] Blades develops a detailed analysis of the recording or non-recording techniques of three groups of activity arising from the hidden economy—undeclared legal production, the production of illegal goods and services and in kind concealed incomes.[20]

Even though we find Blades' analysis persuasive, we feel in imperative to raise two minor criticisms: the first concerns the treatment of certain concealed incomes, the second is the treatment of smuggling. Blades suggests that what different activities making up in kind concealed incomes have in common "is to under-estimate the GDP. He asserts that the goods and services that workers appropriate for themselves as a sort of in kind income are wrongly treated as intermediate consumption in the national accounts."[21]

Certainly this is true if we are talking about final consumption treated as intermediate consumption. Paradoxically, it is not certain that the GDP will be reduced as a result. Blades' argument is perfectly well founded as far as inflated entertainment fees are concerned, and the use of firms' cars, telephones, photo-copying machines for personal ends, but it does not seem quite sturdy enough concerning thefts committed by salaried workers. In fact, material stolen by personnel should be replaced, resulting in increased value-added for the firms producing the material and supplies which are stolen. This increase in value-added, compensating for the initial registration in intermediate consumption, does not change the GDP.

Our second criticism concerns the treatment of smuggled goods. A table summing up the effect of illegal activities on the GDP for the U.S. in 1975 shows quite clearly that when accounting for smuggled goods, the purchase of goods would increase imports and on the contrary, final consumption would be increased by the same amount.[22] All in all, the effect of smuggling will be neutral on the GDP. Although this argument is perfectly well adapted to the case of households who smuggle foreign products for their own final consumption, it seems to us that the value of smuggled goods is much lower than that of the final consumption of goods imported illegally. It appears evident that the smugglers' margin must

[18]Kerrick Macafe: "A Glimpse of the Hidden Economy in the National Accounts," *Economic Trend*, Central Statistical Office, London, February, 1980.

[19]G. A. A. M. Broesterhuizen: "The Unobserved Economy and the National Accounts in the Netherlands: A Sensitivity Analysis," Revised version of a paper presented at the International Conference on the Unobserved Economy, Wassenaar, The Netherlands, June 1982.

[20]Derek Blades: "l'Economie souterraine et les Comptes Nationaux, *Perspectives Economiques de l'OCDE*, Paris, June 1982.

[21]Derek Blades: *op. cit.*, pp. 43 and 44.

[22]Derek Blades: "What Should Be Recorded in the National Accounts and What Difference Would it Make?," in Wulf Gaertner and Alois Wenig eds, *The Economics of the Shadow Economy*, Springer-Verlag, Heidelberg, p. 56.

be considerable for them to take the risk. The position taken by Blades in 1982 seems to be in this direction, since he isolates an import price of 20 um (unité monetaire) and a selling price of 100 um for his example regarding heroin.[23]

To sum up, without contesting the overall pertinence of Blades' analysis, the estimations that he suggests are probably over-estimated to take into account increases due to certain in kind concealed incomes and to goods which are the object of illegal international trade.

D. *Compound Methods*

For compound methods we group together the macroeconomic estimations which consider that many factors contribute to the explanation of the hidden economy and that consequently, we must consider them simultaneously in trying to quantify them. The method which seems to us the most representative is that developed on several occasions by Frey and Weck.[24] Even though the authors term this approach "naive," it has the advantage of allowing us to estimate the hidden economy of several countries at the same time. First, all the explanatory variables of each country are recorded, then the countries are classified in descending order, each country being ranked for each variable. The final classification of the countries is calculated after giving each variable a weight, and a test for the sensitivity of the weight chosen. Passing from a classification (ordinal) to a quantification (cardinal) is done at the end of the analysis;. For this, all one needs is two estimations, calculated with any method in two different countries, to be considered as true.

Two criticisms might restrict the results obtained. The first is an external one: we have to resort to another method in order to be able to quantify. The second criticism is internal and concerns the choice of the explanatory variables of the hidden economy.

Because the entire approach is founded on ranks, we must be sure that all the selected variables are structural. For example, to appreciate the influence of the tax system, a good indicator might be the share of tax and social security burden in the GDP. On the other hand, the change in tax pressure on the change in the GDP would be a rather suspect indicator. In that case we have to weight it with the share of all the taxes in the GDP to obtain a more structural dimension to the chosen variable.

In this spirit, we are going to criticize the almost systematic use of the rate of unemployment variable. In fact, as indicated in other papers, this variable is by nature too cyclical.[25] If it is true that unemployment reacts to hidden employment, it is also true that the process of classification can be used without risk of

[23]Derek Blades: "l'Economie souterraine . . .," *op. cit.*

[24]Bruno S. Frey and Hannelore Weck: "What Produces a Hidden Economy? an International Cross Section Analysis," *Southern Economic Journal*, Vol. 49, No. 3, January 1983.
Bruno S. Frey and Hannelore Weck: "Estimating the Shadow Economy: a 'naive' approach," *Oxford Economic Papers*, Vol. 35, No. 1, March 1983.
Bruno S. Frey and Hannelore Weck: "The Hidden Economy as an 'Unobserved Variable'," *European Economic Review*, Vol. 26, No. 1-2, October-November 1984.

[25]Philippe Barthélemy: *L'Emploi légal caché dans les pays de l'OCDE: Analyse méthodologique et essais de quantification*, research contract for the OECD, G.R.I.F.E., 1984, p. 40.

destabilizing the results if we use an average rate of unemployment observed over a long period rather than a rate of unemployment for one particular year. In fact, this criticism which leads to favoring structural weightings rather than subjective ones recalls the well-known controversy about the famous "e" of the indicator of income inequality of Atkinson.

We know that the choice of this aversion coefficient for inequality can be interpreted as that of a weighting, by nature subjective, of different incomes. When $e = 0$, all incomes intervene in calculating the inequality according to the amount observed. When $e \to \infty$ on the other hand, a higher weighting is given to the lowest incomes. In this context, the rate of unemployment would be equivalent to a strictly positive e, and the average unemployment rate to an e which is equal to 0.

At the same time as this criticism of the use of the rate of unemployment variable, we should note the badly defined, and also subjective, character of the "tax(im)morality." Even if it is not, *a priori*, questionable to choose an indicator of this type, we can nevertheless be sceptical about Frey and Weck's treatment of it. In the first place, for many countries in their sample for which there were no available data, an average rank was attributed. Even if the approach cannot be questioned *a priori*, the fact that countries as different as the United States, Japan or Ireland were "graded" in the same way raised some fundamental objections. In the second place, there is nothing which proves that tax morality deteriorates in all countries at the same rate as in the U.S. Remember that on the basis of questionnaires given in this country the indices of the deterioration of tax morality were calculated, indices which were simply transposed "in order form" to other countries in the sample.

Finally, we must not forget that tax systems are often very different from one country to another and even if two countries have very close levels of taxation, they can have very dissimilar structures of their tax systems and thus very different behavior towards them. Let us add that the real "morality" should not be measured only in terms of taxes, but should also be extended to social contributions. One only has to consult the tables of the structure of tax and social security burden in different countries to see that the situations are very different.

Now that we are nearly at the end of this critical analysis of the methods of estimation, two attitudes appear to be possible. According to the first, some methods must be rejected because they are all vulnerable to different degrees. According to the second, they should be kept because the quantifications to which they lead are simply rival measures of a phenomenon which is by nature not easy to measure.

The fact that we favor the second alternative is already an invitation to follow this investigation. Also, after having analyzed the methods, we should now analyze the results.

S.2. A Critical Analysis of the Results

Just as the choice of methods was important above, so the choice of results is going to be important here. We do not believe that an accumulation of estimations will clarify our problem, but we do believe that it would be a good

thing to isolate several important characteristics which are at the heart of available works.

In the first place, how can we explain that in the same country, for the same period, different methods not only give different estimations—which is not surprising—but also give estimations which are always classified according to a fixed hierarchy. Feige's method always gives higher results than Gutmann's, which in its turn is always higher than Tanzi's, etc. In the second place, are there indices which are likely to show that the hidden economy is perpetually increasing?

In order to attempt to answer these two questions we shall study the hierarchy of results (A) before the growth of the hidden economy (B).

A. *The Hierarchy of Results*

There are at least two main questions to pose in the matter of the hierarchy of estimations. The first concerns the fields covered by the hidden economy. How the activities to quantify are recorded according to an extensive or an intensive conception will quite logically produce very different results. For example, including domestic activities, or excluding them leads to considerable deviations. In the background there is also the problem of over- or under-estimations depending upon whether barter is included or excluded in the accounts. The second problem, which is more difficult to resolve, concerns results with a well-affirmed position in the hierarchy, but which might represent a hidden economy defined according to modalities which are very similar.

Consequently we shall develop first of all the "hierarchy of results and heterogeneous definitions" (a), and then the "hierarchy of results and homogeneous definitions" (b).

a) The Hierarchy of Results and Heterogeneous Definitions

To go back to Blades' classification, the hidden economy is made up of three elements: undeclared legal production, the production of illegal goods and services and in kind concealed incomes. In an even wider aspect some authors include domestic production. If we know that the latter is evaluated according to accounting methods (opportunity cost or market substitution) in a bracket between 30 and 70 percent of the GDP it is not difficult to justify the deviations in the estimations. Similarly, some evaluations concern only one or two of Blades' headings. Here again, there is no discussion about the hierarchy of the results.

More interesting, however, is the problem of estimations by accounting methods which are systematically lower than quantifications by monetary methods, the labor market or the compound methods. The reason appears to stem from the distinction between the turnover of the hidden economy and the non-recorded hidden economy. National accounts exclude from their field of investigation hidden activities included in the GDP and do not measure those which, according to the norms in force, do not belong to them. So it is not surprising to see that estimations made with accounting methods (from 2 to 5 percent of the GDP) are lower than the others (5 percent and more).

However, we should note that the first usually arise from an addition of each activity included whereas the second stem from a direct understanding of the hidden economy as a whole. An additional source of error which might

explain not the hierarchy but the gap might thus be suggested. In fact, accounting methods evaluate independently tax fraud, smuggling, concealed labor, theft, prostitution, narcotics, counterfeiting, etc, whereas the other methods, which are more direct, measure simultaneously all these activities by observed anomalies in monetary or real aggregates.

In both points of view there are risks of over- or under-estimation. Is there any sense in adding tax evasion and hidden legal labor when we know that incomes embezzled by fraud are later allocated, at least in part, to the remuneration of undeclared workers.[26] Does it make sense to consider thefts when they are simply transfers?

Behind all these considerations, there is the essential distinction between production, income and expenditure. The merit of accounting methods is that they isolate these three facets of reality, but, in certain cases, at the risk of masking in an aggregate, an authentic activity (the hidden labor performed by households on behalf of households, for example), or in other cases, to account for them twice. The advantage of the other methods is that they are not vulnerable to this criticism. On the other hand, the risk of the double accounting of an income and an outlay should not be under-estimated, in that they record transactions more than production and its counterparts.

Before tackling the delicate question of disparities specific to the methods, we should bring up a purely arithmetic source of the deviations in the estimations. These stem only from the choice of numerators and denominators in the presentation of the quantifications.

Imagine an economy whose official GDP Y_0 is equal to 100. By definition it breaks down into a legal GDP Y_L assumed to be equal to 90 and a recorded hidden GDP Y_{SE} equal to 10. The non-recorded hidden economy Y_{SN} is assumed to be equal to 5. The total GDP Y_T is thus equal to 105 and the total hidden economy Y_S is equal to 15. The results could, alternatively, be presented in the following way:

$$\text{Case No. 1:} \quad \frac{Y_{SN}}{Y_0} = \frac{5}{100} = 5.0\%$$

$$\text{Case No. 2:} \quad \frac{Y_{SN}}{Y_L} = \frac{5}{90} \simeq 5.6\%$$

$$\text{Case No. 3:} \quad \frac{Y_{SN}}{Y_T} = \frac{5}{105} \simeq 4.8\%$$

$$\text{Case No. 4:} \quad \frac{Y_S}{Y_0} = \frac{15}{100} = 15.0\%$$

$$\text{Case No. 5:} \quad \frac{Y_S}{Y_L} = \frac{15}{90} \simeq 16.7\%$$

$$\text{Case No. 6:} \quad \frac{Y_S}{Y_T} = \frac{15}{105} \simeq 14.3\%.$$

[26]Philippe Barthélemy: "La Participation des français à l'économie souterraine," in Daniel Vitry and Bernadette Marechal eds., *Emploi-Chômage: modélisation et analyses quantitatives.* Collection de l'Ime, Dijon, 1984. Pierre Pestieau: "Belgium's Irregular Economy," in Wulf Gaertner and Alois Wenig eds., *op. cit.*

It appears that the most current presentations are based on a denominator of the type Y_0. When we compare case 1 with case 4, we have the arithmetical explanation for the hierarchy between accounting methods and the others.

b) The Hierarchy of Results and Homogeneous Definitions

The object of this paragraph is to try to clear up a veritable mystery. With definitions of the hidden economy just about identical, the monetary methods of Feige, of Gutmann and of Tanzi give estimations which differ greatly, and yet which are always ranked in the same hierarchical order.[27] This situation occurs no matter which countries or years are chosen for the estimation, as the following examples show:

West Germany:			
	Feige's method	24.0%	(1980)
	Gutmann's method		
	Tanzi's method	8.1%-14.6%	(1980)
United States			
	Feige's method	33.0%	(1979)
	Gutmann's method	13.0%	(1979)
	Tanzi's method	8.1%-11.7%	(1976)
United Kingdom			
	Feige's method	15.0%	(1979)
	Gutmann's method	7.2%	(1979)
	Tanzi's method		
Sweden			
	Feige's method		
	Gutmann's method	10.0%	(1976)
	Tanzi's method	7.0%-17.0%	(1978)
Canada			
	Feige's method	22.0%	(1979)
	Gutmann's method	13.0%	(1978)
	Tanzi's method	2.5%-12.4%	(1976)

Remarks on the Table

These approaches we have qualified Feige's, Gutmann's or Tanzi's are not uniform in their details. The variables chosen in estimating the function of the demand for money are not always the same, for example. Even more important is the hierarchy, identical in the five countries of the OECD where several methods have been used apart from examining the variants of each approach, which have produced several estimations. In addition, Tanzi's method, as we were able to analyze above, gives estimations which depend heavily on the assumptions chosen concerning the velocity of money. We think we can attempt to give an explanation of the hierarchies observed by suggesting a reduced analysis of the three generic methods.

[27]It is clear that the definition given by Tanzi is completely wrong with regard to what he claims to measure: "It is gross national product that, because of unreporting and/or under-reporting, is not measured by official statistics" (*op. cit.*, p. 428). Tanzi defines the field of analysis of the accounting methods but he estimates that of the monetary methods. We can consult Richard D. Porter and Amanda S. Bayer on this point: "A Monetary Perspective on Underground Economic Activity in the US," *Federal Reserve Bulletin*, March 1984, p. 182.

In Feige's method, we calculate the total production PT by adding MV and $M'V'$. MV represents the currency multiplied by its velocity and $M'V'$ represents the demand deposits multiplied by their velocity.

In Gutmann's method, we attribute the explanation of the hidden economy to currency C and not to the demand deposits D. According to the established expression, hidden transactions are paid "in cash."

In Tanzi's method, we estimate by econometrics, a relationship of the type $C/M_2 = f(\cdot)$ or $C/M_1 = g(\cdot)$ according to the variants and we justify, by the variables introduced in the multiple regression, the tendential variations in the ratio. In addition, the substitution effects between C and M_2 or M_1 are taken into account. In an improved version of the method we can base the estimated expression on the portfolio theory for the substitution effects to be even better integrated.[28]

This presentation of methods leads us quite naturally to wonder about the way each one assumes that the hidden economy is irrigated. For Feige, we have $MV + M'V'$ which play an explanatory role. For Gutmann, we have MV which plays an explanatory role, and $M'V'$ thus seems to be outside the problem of the hidden economy. For Tanzi, it is again MV which plays an explanatory role, $MV + M'V'$ in the C/M_1 version or $MV + M'V' + M''V''$ in the C/M_2 version is excluded from the analysis (in the latter case, M'' represents near-money and V'' the velocity of this near-money). It is therefore logical that Feige's method gives higher results than the other two: all liquid assets M_1 irrigate the hidden economy.

Likewise, it is perfectly well explained that Gutmann's method gives higher estimations than Tanzi's, because in the first MV is related to $M'V'$, whereas in the second MV is related to $MV + M'V'$ (C/M_1 version) or to $MV + M'V' + M''V''$ (C/M_2 version). Thus we obtain the following hierarchy, for one country at one period:

$$\text{Feige} \quad MV + M'V'$$

$$\text{Gutmann} \quad \frac{MV}{M'V}$$

$$\text{Tanzi } (M_1) \quad \frac{MV}{MV + M'V'}$$

$$\text{Tanzi } (M_2) \quad \frac{MV}{MV + M'V' + M''V''}$$

In fact all three can be termed methods in terms of transaction. All monetary assets are used in the hidden economy according to Feige, but only currency according to the other two methods, the weighting being lower for Gutmann than for Tanzi (the denominators are different). More theoretically, the fundamental difference between the methods is the conception of the legal and illegal liquidity chosen by the authors. Feige's conception is extensive, for Gutmann and Tanzi

[28] K. G. P. Matthews: "Demand for Currency . . ." *op. cit.*

it is more restricted. Tanzi's weighting is more extensive than Gutmann's, which produces a hierarchy between the evaluations of the last two authors.

Followers of Gurley and Shaw or of the Radcliffe report who would like to quantify the hidden economy would find, all other things being equal, a lower estimation than Tanzi's. In fact, he would theoretically have to weight MV by $M_3(M_3 = M + M' + M'' + \text{short-term assets})$.[29]

The analysis of the velocity of money adopted in each method means that we can study this classification of the hierarchy more thoroughly. If the velocity is assumed to be identical in the two spheres of the economy, the hierarchy observed is sufficient to differentiate the methods. If, on the other hand, in Tanzi's approach, we suppose a higher velocity in the hidden sector, the estimations will tend to be closer to Gutmann's and even to surpass them. In Tanzi's method, if we assume a very high velocity, Feige's estimation could in its turn no longer be the highest. Generally, the maximum velocities anticipated are not enough to increase Tanzi's estimations so that they exceed those of Feige; this is simply due to the effect produced by an acceleration of V over MV. It is perfectly possible to transfer this argument to Gutmann's method, which also needs an assumption on V.

To make this explanation even firmer, we should note that the three authors take care to indicate that the hidden transactions realized in the Barter Economy are not recorded. This can only confirm our attempt to explain the hierarchy based on the way in which the hidden economy is fed. Our last developments will concern an excess of these static estimations, and we shall analyze the growth of the hidden economy.

B. *The Growth of the Hidden Economy*

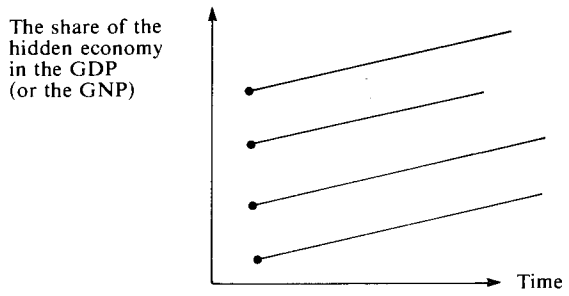
Just because the methods can be criticized and the estimations differentiated is no reason for the growth of the hidden economy to be unknown. The hierarchy of the results is not a problem in itself, since it is the growth which is more important than the level.

Assuming that all the methods converge to express a tendency for the hidden economy to increase, the proofs are sufficient to confirm the growth of the phenomena (case No. 1). With the opposite assumption that there is divergence between the methods, a more selective analysis is necessary in order to come to a conclusion (case No. 2).

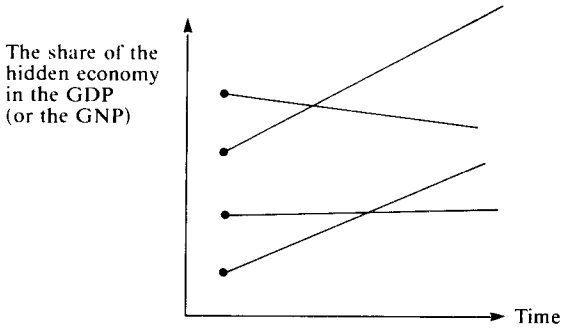
The two diagrams below illustrate this aspect of the problem.

Examining the different studies whose conclusions allow us to diagnose the development of the hidden economy, we are left with a double impression. When monetary and composite methods are used, there is an overall growth in the hidden economy. On the other hand, when accounting methods are used, the conclusion is that there is a stabilization and sometimes a regression of the hidden economy in the official GDP (or the GNP).

[29]We know that in the controversy which separates the believers in the new currency principle from those who believe in the new banking principle of monetary aggregates, Gurley and Shaw as the editors of the Radcliffe report consider the whole spectre of liquidities as "Money." Thus, logically, it is not M_1, nor M_2 which figures in the weighting, but a very extensive monetary aggregate.



Case No. 1. Convergence of the indicators



Case No. 2. Divergence of the indicators

So, let us examine, one by one the developments noted with each method, before coming down in favor of one of the conclusions.

a) Feige's Method

Our illustrations apply to West Germany and the United Kingdom.

West Germany

The Hidden Economy as a % of the GDP

1960	1	1971	10
1961	3	1972	8
1962	3.5	1973	8
1963	4	1974	8
1964	3	1975	16
1965	3.5	1976	18
1966	4	1977	23
1967	4.5	1978	24
1968	9	1979	24
1969	14	1980	27
1970	16		

Source: Enno Langfeldt: The Unobserved Economy in the Federal Republic of Germany: a Preliminary Assessment," paper prepared for the International Conference on the Unobserved Economy, Wassenaar, The Netherlands, June 1982, p. 24.

Remarks: The figures are taken from a chart and are therefore approximate.

The United Kingdom

The Hidden Economy as a % of the GDP

1960	0	1970	8
1961	5	1971	8
1962	7	1972	16
1963	6	1973	18
1964	7	1974	23
1965	8	1975	14
1966	11	1976	14
1967	10	1977	15
1968	10.5	1978	14
1969	11	1979	14.5

Source: Edgar L. Feige: "The U.K.'s Unobserved Economy: a Preliminary Assessment," *Journal of Economic Affairs*, Vol. 1, No. 4, July 1981, p. 211.

Remarks: The figures are again taken from a chart and are approximate.

b) Gutmann's Method

Below are two illustrations, one for the United States, and the other for Ireland.

The United States

The Hidden Economy as a % of the GNP

1960	3.2	1971	6.3
1961	2.9	1972	6.0
1962	3.2	1973	6.8
1963	3.9	1974	8.6
1964	4.1	1975	10.0
1965	4.5	1976	11.0
1966	5.3	1977	11.7
1967	5.0	1978	12.4
1968	5.0	1979	13.1
1969	5.7	1980	14.3
1970	6.2		

Source: Barry Mofelsky: "America's Underground Economy," in Vito Tanzi ed: *The Underground Economy in the U.S. and Abroad*, Lexington Books, Lexington Mass., 1982, p. 54.

Remarks: We have calculated the percentages. The text presents the GNP and the hidden economy in billions of dollars.

Ireland

The Hidden Economy as a % of the GDP

1975	1	1980	8
1976	1	1981	8
1977	2	1982	9
1978	4	1983	11
1979	7		

Source: G. E. Boyle: "In Search of Ireland's Black Economy," *Irish Banking Review*, March 1984, p. 38.

Remarks: The method used is allied to Gutmann's, but the calculation is more "probable." Notes are linked with a "spending in consumer goods" indicator.

c) Tanzi's Method

For the third method, our illustrations concern Switzerland, West Germany and the U.S.

Switzerland

The Hidden Economy as a % of the GNP

1952	0.1	1970	2.1
1955	0.1	1975	3.5
1960	0.5	1980	3.7
1965	1.1		

Source: Hannelore Weck-Hannemann and Bruno S. Frey: "Measuring the Shadow Economy: the Case of Switzerland," in Wulf Gaertner and Alois Wenig eds. The Economics of the Shadow Economy, Springer-Verlag, Berlin, Heidelberg, 1985, p. 91.

West Germany

The Hidden Economy as a % of the GNP

Table A		Table B	
1960	0.1 to 1.4	1960	1.6 to 2.3
1965	2.8 to 4.4	1965	2.5 to 3.8
1970	1.6 to 4.9	1970	1.1 to 3.7
1975	4.3 to 6.5	1975	3.9 to 8.6
1980	8.1 to 13.0	1980	8.6 to 14.6

Source: Gebhard Kirchgassner: "Size and Development of the West German Shadow Economy—1955–1980," *Zeitschrift fur die Gesamte Staatswissenschaft*, Vol. 139, No. 2, 1983, p. 211 (Table A) and p. 213 (Table B).

Remarks: Table A is calculated by Tanzi's method, Table B by Klovland's method which is a variant. The brackets suggested originate in several equations tested for each of the variants.

The United States

The Hidden Economy as a % of the GNP

Table A		Table B	
1960	2.6	1960	4.1
1961	2.9	1961	4.2
1962	2.6	1962	3.9
1963	2.8	1963	4.0
1964	2.2	1964	3.8
1965	2.5	1965	3.8
1966	2.9	1966	4.1
1967	3.2	1967	4.5
1968	3.6	1968	4.3
1969	3.3	1969	4.5
1970	2.6	1970	4.6
1971	2.8	1971	4.7
1972	2.9	1972	4.7
1973	3.1	1973	4.4
1974	3.4	1974	4.9
1975	3.0	1975	5.0
1976	3.6	1976	5.5
1977	3.7	1977	5.2
1978	3.8	1978	5.3
1979	3.7	1979	5.4
1980	4.5	1980	6.1

Source: Vito Tanzi: "The Unobserved Economy in the U.S.: Annual Estimates 1930-1980," *Staff Papers*, Vol. 30, No. 2, June 1983, p. 300 and 301 (Table A) and p. 298 and 299 (Table B).

Remarks: Tables A and B show the results obtained from two variants of Tanzi's method. The data above have been rounded up with regard to the initial text which is precise to two figures after the point.

d) The Composite Method

One of the advantages of this method, as we pointed out earlier, is that it can be applied to several countries at the same time when two additional basic estimations are known. Profiting here from this possibility, we show the estimations for 17 OECD countries.

17 OECD Countries

The Hidden Economy as a % of the GNP

Country	1960	1978
Sweden	5.4	13.2
Belgium	4.7	12.1
Denmark	3.7	11.8
Italy	4.4	11.4
Netherlands	5.6	9.6
France	5.0	9.4
Norway	4.4	9.2
Austria	4.6	8.9

The Hidden Economy as a % of the GNP

Country	1960	1978
Canada	5.1	8.7
West Germany	3.7	8.6
United States	6.4	8.3
United Kingdom	4.6	8.0
Finland	3.1	7.6
Ireland	1.7	7.2
Spain	2.6	6.5
Switzerland	1.1	4.3
Japan	2.0	4.1

Source: Hannelore Weck-Hannemann and Bruno S. Frey: "Measuring...," *op. cit.* p. 100 and 101.

Remarks: In order to show all the data in the same way (percent of the GNP), we have reconstituted the column for 1960 from Table 11 (p. 100) and Table 12 (p. 101) from the article quoted in the reference.

e) The Accounting Method

There is not, to our knowledge, any long series of measurement of the hidden economy expressed as a percent of the GDP or the GNP calculated by the accounting method (measurement of the un-recorded hidden economy). However, the indices show a stabilization and even a decrease of hidden activities. We would like to give two sorts of example. The first group of "proofs" concern the United States and the United Kingdom, the second, The Netherlands.

Example No. 1: We know that one version of the accounting method is to infer the hidden economy from the statistical gap between income and expenditure. It seems that this gap tends to decrease over a long period in the United States, and to increase slightly in the United Kingdom.

The United States

The Statistical Gap as a % of the GDP

1971	0.38	1976	0.30
1972	0.28	1977	0.23
1973	0.06	1978	0.30
1974	0.26	1979	0.09
1975	0.36	1980	0.06

Source: Vito Tanzi: "A Second (and more sceptical) look at the Underground Economy in the U.S.," in Vito Tanzi, ed. *op. cit.* p. 118.

The United Kingdom:

The Statistical Gap as a % of the GDP

1960	0.3	1970	0.3
1961	1.3	1971	2.0
1962	1.0	1972	1.4
1963	0.9	1973	2.5
1964	1.2	1974	3.9
1965	0.4	1975	3.6
1966	0.8	1976	3.5
1967	1.4	1977	3.2
1968	1.6	1978	3.3
1969	0.2		

Source: Kerrick Macafee: "A Glimpse of the Hidden Economy in the National Accounts," *Economic Trends*, Central Statistical Office, London, February, 1980, p. 84.

Remarks: Since the data are taken from a chart, the figures are approximate.

Example No. 2: Another way of recording the hidden economy is to estimate the chances that the official estimations are falsified owing to the level and in the increase in the hidden economy. In the Netherlands, Broesterhuizen's conclusions, devoted to a thorough analysis of the methods of recording data in the national accounts are opposed to the idea of a tangible increase in the non-recorded hidden economy. In the matter of levels, this author believes that a bias in the GDP which is higher than 5 percent is very improbable. As far as growth is concerned, a distortion higher than 0.5 percent is also not anticipated.[30]

All in all, since we have to take a position on the growth of the hidden economy, the tables presented above invite the conclusion that hidden activities become more and more important each year. This statement can be supported by several arguments. In the first place, monetary and compound methods are almost unanimous in showing an increase in the hidden economy.[31] In the second place, this statement is true for all countries. In the third place, for the methods which are partially dependent on the choice of the initial year for the estimation, it appears that the same conclusion holds no matter which benchmark is chosen.

Even if accounting methods do not appear to lend themselves to similar deductions, there are two series of arguments, which in spite of everything, support the proposition of growth.

The first argument concerns the recording of the non-registered part of the hidden economy, and not of all the hidden economy. We come back to this here in that, given the progress of statistical methods, it is not unlikely to think that the part of the hidden economy recorded, with fixed conventions, increases. As an example, the continual improvements in the techniques of estimating tax evasion implies a necessary increase in official GDP and as a result, a slower

[30]G. A. A. M. Broesterhuizen: "The Unobserved Economy and the National Accounts in the Netherlands," revised version of a paper presented at the International Conference on the Unobserved Economy, Wassenaar, The Netherlands, June 1982, p. 39.

[31]One exception is worthy of note, that in the article by Dilnot and Morris, *op. cit.*, p. 62, where the authors show that the hidden economy in the United Kingdom would go from 34.3 percent of the GDP in 1952 to 7.2 percent of the same aggregate in 1979.

increase in non-registered tax evasion. Among other things, the arguments developed by Blades on the incidence, negative or zero, in the national accounts of certain sections of the hidden economy, (subject, possibly, to our criticisms) help to show a more limited incidence of growth of the hidden activities in accounting methods than in the other methods.

The second argument is more theoretical. Even if it is possible to show that there is a significant and positive relationship between the statistical gap of the accounting method and the average tax rate, it does not appear that there would necessarily follow a relationship between movements of the statistical gap and movements of the hidden economy. This demonstration, presented by Matthews, in the framework of a two sector model throws doubt on even the realism of accounting methods based on the development of the statistical gap.[32]

If we give credit to the proposition that the hidden economy is increasing, we should, nevertheless, indicate that this growth does not happen at a constant rate. There are periods of very slow growth (in the 1960s), periods of faster growth (the beginning of the 1970s) and periods of intermediate growth (the end of the 1970s and the beginning of the 1980s). These trends in Western countries taken as a whole, are matched by national peculiarities. For example, in West Germany, a thrust in the hidden economy was observed from 1968, whereas the movement of increase seemed to be more regular in the United States or in Switzerland.

An analysis of the average, annual rate of growth by country has no great significance in that the hierarchy of the results in terms of the methods makes the foundations of the calculations very heterogeneous. On the other hand, for any particular method, the rate of growth can be calculated. With the data of the composite method, we can also calculate the average annual growth rate of the share of the hidden economy in the GNP between 1960 and 1978. For the 17 OECD countries, and in decreasing order of rate of growth, the results are as follows.

Ireland	+8.3%
Switzerland	+7.9%
Denmark	+6.7%
Italy	+5.4%
Belgium	+5.4%
Spain	+5.2%
Sweden	+5.1%
Finland	+5.1%
West Germany	+4.8%
Norway	+4.2%
Japan	+4.1%
Austria	+3.7%
France	+3.6%
United Kingdom	+3.1%
Netherlands	+3.0%
Canada	+3.0%
United States	+1.5%

[32]K. G. P. Matthews: "The GDP Residual Error and the Black Economy: a Note," *Applied Economics*, Vol. 16, No. 3, 1984.

It can be seen clearly from this table that the share of the hidden economy in the GNP increases in all the countries, but that the rate of growth of this share is quite different: but just the fact that the shares increase is enough to draw the conclusion that the growth of the hidden economy is faster than the growth of the official GNP.

To sum up, all the indicators chosen converge to show that the growth of the hidden economy is a reality common to all countries. However, this growth is not very homogeneous in time nor in place. As far as time is concerned, periods of fast growth alternate with periods of slower growth. As for place, countries do not all have the same rate of growth. The hidden economy is increasing everywhere, but differently.

General Conclusion

In conclusion, we have the feeling that more has been destroyed than has been constructed. Monetary methods have been criticized one by one, the labor market methods have been suspected, the conclusions of the accounting approaches have been amended, the composite methods made relative. And yet, we have reached two additional conclusions of a more positive nature. On the one hand, a direction has been suggested to explain the hierarchy of estimations, and on the other hand we have proofs which give credit to the observation that hidden activities are on the increase.

As a last appreciation on macroeconomic methods of quantifying the hidden economy, it seems to us quite interesting to bring up the analogy between the problems we have posed and the hesitations which, at the beginning, marked the measuring of the level of economic development.

At first, we considered that the income *per capita* variable was a sufficient indicator of development. Later, we realized that this variable was a better measure of flow than of stock; on the one hand, we cannot work out the level of development from income, and on the other hand, the inequalities in the distribution rendered the indicator quite incorrect. In an attempt to go beyond these very indirect measures and avoid adding to difficulties inherent in converting into dollars the money of different countries, more direct methods were used instead. Kravis, Heston and Summers invented an indicator which took real income into account; the purchasing power parity of money and the reference to the situation of an imaginary country assuring a measurement of the development which was more realistic than the simple level of income *per capita*.[33] Beckerman with his direct indicators on the one hand, Giran with his literary production criterion on the other hand, later measured the level of development with direct indicators, regardless of income, regardless of the rates of exchange and even to a certain extent, the indicators which pick up the dimension of inequality.[34,35]

[33]I. B. Kravis, A. W. Heston, and R. Summers: *International Comparisons of Real Product and Purchasing Power*, Johns Hopkins UP, Baltimore, 1978.

[34]Wilfred Beckerman: "Comment comparer les revenus réels dans différent pays?," *L'Observateur de l'OCDE*, No. 26, February 1967.

[35]Jean-Pierre Giran: "Richesse matérielle, richesse culturelle et mesure du développement économique," *Cahiers d'Economie Politique*, FEA, No. 1, October 1975.

Are we going to have to follow a parallel approach to measure the hidden economy? After a first stage where mainly indirect indicators were used, we are already moving to a phase where more direct methods are preferred. With the progress made in computors, in data processing, with a better knowledge of survey techniques, sample products being used in concealed transactions or significant professions could be isolated. By these means, the hidden economy could be better quantified and the criticisms that we have raised concerning the indirect methods would become more positive than negative in this new context.

However, resorting to revived direct methods in the future is not enough to encompass the hidden economy in all its reality and complexity. We should not forget, in fact, that there is no clear-cut line between two hidden economies which are by nature very different from each other. First, there is the result of behavior of those who have decided to live in society without contributing to the costs, which should be condemned, and the result of everyone's desire to escape exorbitant constraints, which should be respected. When we quantify the hidden economy, we are forced to amalgamate these two, very different, forms of activity.

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