

A CONCEPT OF SATELLITE ACCOUNT IN THE REVISED SNA

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Within the last two decades, national accountants wondered whether they were able to solve problems that in many respects were of the squaring the circle type: how could they embellish their representation of the economy without having their instrument grow heavier and less flexible? How could they elaborate synthetic frameworks in fields of collective concern that could both be specific and insure a dialogue with macroeconomics? How to keep consistent with the central framework and at the same time experiment with some freedom and flexibility. Satellite accounts are an answer to these questions. Much experience has been accumulated on satellite accounts in both national statistical offices and in international organisations. This paper provides a survey of this work. After an introduction (Part 1) devoted to stating the question, we try to propose a classification for the different types of satellite accounts (Part 2). Then we show their common characteristics (Part 3). However, this exercise would still remain abstract if we did not present samples of currently produced accounts. That is what we do in Part 4 with four examples. These examples have purposely been chosen in fields where many countries and international organizations have heavy investments, thus insuring the specific results will be obvious.

1. INTRODUCTION

(a) *Central Framework and Satellite Accounts*

The content of the central framework of national accounts depends on theoretical choices—for example the extension of the concept of production; on the maturing of theories—according to the present state of thought on natural resources, the latter cannot be used as national accounts' production factors; on the nature of predominant social concerns—primacy given to the marketed economy, but also on the possibility to make measurements, to group data effectively and to integrate them in the other data of the central framework without any excessive complexity or unwieldiness (Vanoli, 1986).

In certain cases, it is possible to present complementary analyses in the form of tables, one of the totals of which appears directly in the central framework, but the details of which are specific and generally affect only one institutional sector: the main present complementary analyses concern the functional analysis of the general government expenditure, and the breakdown by purpose of the consumption of households; the breakdown by social and occupational categories of the accounts of households can also, under certain conditions, be considered as a complementary analysis.

Thus defined, the limits of the complementary analyses are relatively tight since these analyses can never enter into contradiction either with the conceptual logics or the conventional choices of the central framework: in complementary

Note: The author wishes to acknowledge that the work of Maryvonne Lemaire and Jean-Louis Weber served as an inspiration to his paper and that this survey would not have been possible without the experience accumulated in INSEE under André Vanoli's direction. Nevertheless the views expressed here are those of the author and do not necessarily represent those of INSEE.

analyses, classical problems such as how to deal functionally with medical education (education or health?), officer-training schools (education or defense?), or agricultural research (research or agriculture?), can only receive answers which are coherent with the choices made in the central framework. The same applies to most of the public aids in the form of tax relief (see paragraph 4(a)(ii)), etc.

However, considering the progress made in analyzing the main fields of collective concern it must be possible to utilize those gains in the national accounts (Januard 1971): this is the subject of satellite accounts. They deal with economic activities that in the central framework are traced in a non-exhaustive or a non-explicit manner (agriculture, transport, tourism, commerce, etc.), or they make a complete analysis of the economic or social functions that appear only partly in the central framework (research, social protection, etc.).

(b) *Objectives of the Satellite Accounts*

Satellite accounts fulfill a twofold objective:

First they group, in an exhaustive manner, the monetary flows relating to their field; they structure them so that the flows and aggregates that appear are of interest to managers. This objective may appear paradoxical at first glance: it reveals and develops elements included or admissible in the central framework, thus bearing its constraints; it also fosters approaches which vary from the structure of the central framework. In particular the fields concerned generally go beyond the usual boundaries of the institutional sectors, the usual limits between national accounts transactions and even the boundaries of the economic field chosen by the central framework. Thus, nothing prevents the inclusion of educational investment in the satellite account on education, whereas this would require fundamental modifications to the central framework; changing the boundaries of the production of educational services; introduction of the corresponding capital as a production factor, which would partially or totally replace the present employment factor in the other branches. Nor does anything prevent one from envisaging a satellite account on culture (Lemaire 1986) in which works of art would, contrary to their presentation in the central framework, be described as reproducible assets. It would then be necessary to modify the field of production to include works of art, to examine the nature of the income assigned to artists which would no longer be income from intangible assets, and to define rules on the valuation of the artistic worth of works and on their depreciation. Once again nothing stops one from valuating the own-account transport by households as a production in a satellite account on transport (Transports 1987). It would then be necessary to regard vehicles as investments, fuels as intermediate consumption and to valorize time behind the wheel. . . .

Second, they progressively group the non-monetary data of the field (for example, producers' employment, data on the beneficiaries or on the beneficiaries of production or transfers, total number of machines and equipment goods, etc.) and they link them up with the previous data.

In consequence, for the specific field it covers, a satellite account both structures information and results simultaneously from this structuring. It is a structuring instrument of both the corresponding information system, mainly in

its monetary part, and the associated physical data since it supplies integrating elements from the central framework. It is in this sense a “national accounts’ satellite account.” For example, in the social protection field, contributions are the main resources of the managing agencies. The central framework concepts allow the structuring of this mass according to the analysis grid of the incomes to which the contributions are related (wage-earners and employers contributions, non-salaried workers contributions, contributions on benefits paid by the retired and the handicapped, other contributions).

The satellite account results from the structuring of the field since it describes it in accordance with a specific logic; the customary national accounts would of course be incapable of achieving this. Thus an energy satellite account should have two types of synthesis tables: an input-output table (IOT) of a classical nature, but specifically developed in terms of the type of energy and the branches or the main user functions; and various types of energy balances converting into general physical equivalents (tons of coal or oil equivalent) what the IOT expresses in monetary equivalent. These two types of synthesis are linked up by the balances in physical quantities, specific to each form of energy.

The whole set of satellite accounts does not constitute a single partition of the economy, but a constellation of accounts which may overlap (Lemaire and Weber, 1983). The various accounts, in particular their overlapping zones, are linked up, for example, when questions such as the educational or the healthcare nature of medical training arise (see Graph 1).

(c) *Development and Structure of Satellite Accounts*

The development of satellite accounts must be made in a pragmatic manner when, in a field of collective concern, the need appears for information which is both exhaustive and linked with the overall economic statistics. This need arises from the necessity for “dialogue with the macroeconomy,” either because the evolution of the field concerned has high impact on the economy globally (energy, transports or telecommunications provide good examples of this type of relation), or because the global economic evolution makes high constraints appear in the observed field (social protection, education and health are examples).

In a general manner, satellite accounts answer three fundamental questions:

—Who finances?

—Who produces? With what means of production?

—What is the result of the expense and who receives the benefit?

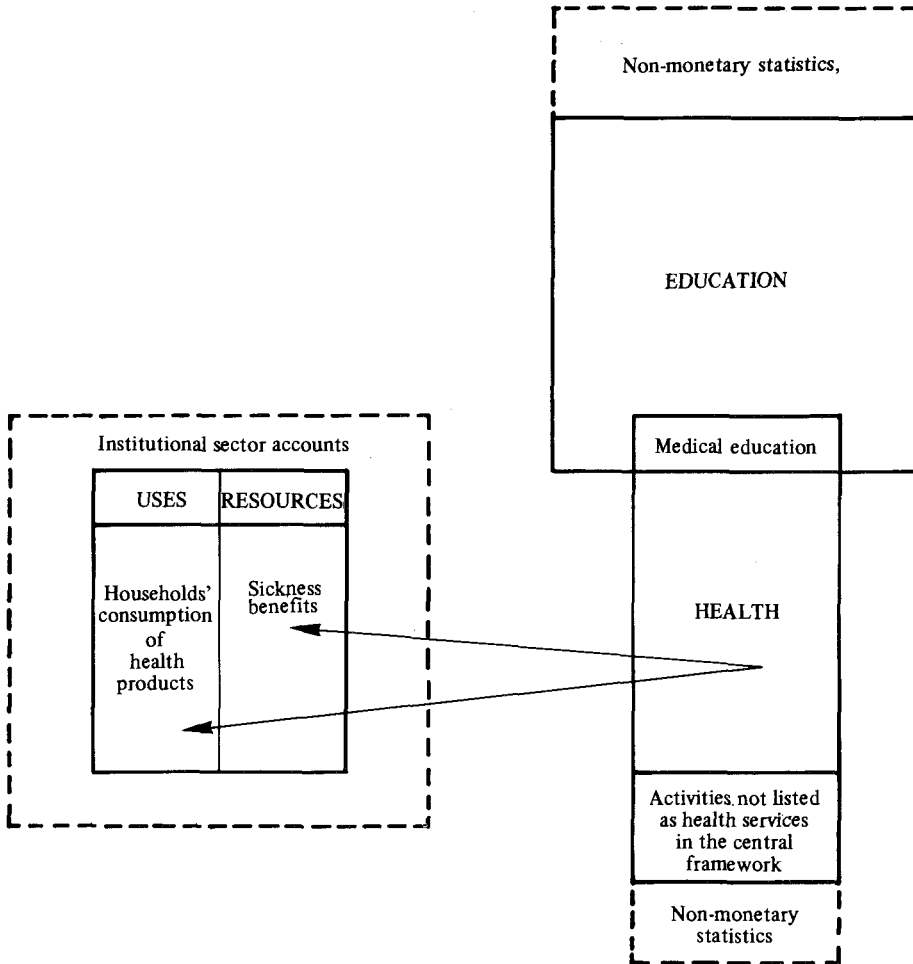
But the relative importance of these three questions and thus the developments devoted to them, vary from one satellite account to another. Satellite accounts are in principle linked up with the central framework. However, when the analysis requirements lead to differences with the central framework concepts and nomenclatures, these differences are carefully analyzed and computed junctions are arranged with them.

The preceding account clearly demonstrates that each of the satellite accounts, like their overall system, can evolve. There are numerous reasons for

GRAPH 1

INTEGRATED CENTRAL FRAMEWORK

SATELLITE ACCOUNTS



On the left, the central framework traces in monetary terms the balance of the operations, and for each institutional sector, the balance of the uses-resources.

On the right, the satellite accounts (which may overlap) are linked up (->) with the central framework by certain monetary flows (only two links have been represented).

In dotted lines : the non monetary statistics that are being progressively organized in satellite accounts.

this, but the three main ones are:

- the insertion of satellite accounts in the studies and decision taking of the general government imply a higher adaptability than that of the central framework, which adopts the same analysis grid for all sectors, and favours the permanence of methods and the length of series;

- satellite accounts must provide answers to the present economic problems in their field, without waiting for the results of developments underway, even if these developments will lead to a different and better description of the field;
- satellite accounts are limited by the state of existing information whereas at the same time they contribute to orienting and accelerating knowledge in a particular field.

Satellite accounts can be completed, developed and even modified at a more frequent rhythm than the central framework. Yet their objective is nevertheless to produce long series: this is the case for the data concerning social protection (1962–1986, series for the Eurostat SESPROS), research (series of data in conformance with the Franscati Manual), or health (1960–1985, series in OECD—“La santé en chiffres”).

2. THE FAMILIES OF SATELLITE ACCOUNTS

Much empirical work on developing or complementing national accounts has been done in the past without having been labelled work on satellite accounts. However, the work has characteristics which would allow for presentation in the form of a satellite account. It is these common characteristics, described in the following presentation, that contribute to rationalizing the overall system of national accounts.

(a) *Economic Activities and Accounts*

Some “economic activity accounts” have been subject to investigation for a very long time. This is the case worldwide for agriculture (Eurostat, 1972; FAO, INSEE, 1971), and in many countries for trade or transportation. Experimental work is being done on tourism and on information, data processing and communication, at the OECD in particular. A complete methodological guide on data processing has been produced on behalf of the Intergovernmental Bureau for Informatics (INSEE, 1985). Energy is the subject of preliminary studies.

Agriculture accounts deal with the creation of income from the complementary viewpoints of agricultural deliveries and production. They also define a gross agricultural income (Eurostat, 1972) and analyze reallocation in a specific manner within the framework of a farmers’ social protection account (INSEE, 1986). They widely develop the central framework with the presentation of accounts according to the technical-economic orientation of farms—different from both enterprises and local units—and at the two levels of the Community nomenclature of regions. They are also very highly linked with the central framework data by the nomenclature (the activities concerned are identical to those of the “Agriculture” branch) and by the valuations, both for the data per branch and per agricultural enterprises.

Trade accounts (INSEE, 1979) develop the analysis of the activities of branches and of companies whose main activity is trade in the central framework. They complete it by analyzing the volume of products traded. In this analysis the “trade function” is not analyzed, but the specialized activity of “resale as

such.” Thus the commercial departments of producing companies are taken into account only for their possible secondary activity of resale as such (turnover), absent from the central framework of the accounts. Finally, trade accounts present the trade circuits between production per product and consumption per function by compiling a “product-sector passage” subdividing products sold, per groups of products and per types of commerce.

In the central framework, transport services generally cover only transport activities for third parties. Complete analysis of the “transport function” including transport activities for their own account by producers and also by households could be envisaged (see, for example, “Transport 1987,” ninth chapter). Two of the main questions such an account should throw light on relate to the means of financing infrastructure and vehicle investments, and the means of dividing costs between users and public authorities (subsidies and aids to carriers, free use of infrastructures or tolls, specific taxation, etc.).

The compilation of an economic activity satellite account is especially useful for activities which are not presented in a clear and exhaustive manner in the central framework. This is the case with transport as mentioned previously, and it is also the case with tourism.¹ Indeed the definition of tourism is not provided in a direct manner by the production classification—all or part of the hotels-cafes-restaurants, and cultural and recreational sports activities would be included in it, nor by the consumption nomenclatures—tourism expenditure does not include only leisure expenditure; tourism includes in general “business tourism” and “international tourism,” the definitions of which do not correspond with those of the data on the “holidays” of resident households.

A private non-profit institutions’ account (cooperative societies, fraternal and benevolent societies and associations and so forth) is also being considered. It would allow a comparison of their economic results with those of capitalist enterprises and would situate the SNA “private non-profit institutions at the service of households” (PNPI) within all the participatory forms of production (Weber, 1983).

(b) “Generalized Functional Analyses”

These were the first analyses to be presented under the name of satellite accounts. Research, education, health, housing, social protection and the environment are fields in which accounts have already been constructed. Social action and culture are examples of fields in which accounts are being or have been drafted.

Note: The definition of these accounts form the common methodological base for satellite accounts which is the subject of Part 3. They also provide the examples detailed in Part 4. This base was used to create the data processing methodological guide. Its extension to very different fields demonstrates its validity beyond generalized functional analyses.

¹Tourism experimental accounts were presented in France for 1979 (see in references). A new estimation is being made for 1985. “Touristic” countries such as Austria, Switzerland and Tunisia are also interested in data of this type, as well as the OECD.

(c) *Other Fields of Satellite Accounts*

Detailed analysis of certain activities of the sole public authorities could be subject of a third family of satellite accounts. In this field, questions frequently arise concerning public aid to the productive system.

Finally the general idea of satellite accounts can be applied, by adapting it, to topics which are related to the national accounts central framework, but which fit into a different philosophy where cost-benefit balances play a preponderant role: alcoholism or road accidents accounts can be cited as examples.

The statistical information organization methods used by the national accounts can be applied to fields where the contact zone with economic accounts is very low: natural resources balance sheets have benefitted from this support in France (Patrimoine naturel, 1986). Junctions are made here by means of the natural resources management and natural environment satellite accounts, which are doubly satellite, both with respect to the natural resources balance sheets and with respect to the economic accounts (Weber, 1983).

3. COMMON CHARACTERISTICS TO SATELLITE ACCOUNTS

The request for a synthesis framework for a field of collective concern is generally presented by the concerned governmental agency. The decision to create this framework in the form of a satellite account normally derives from a joint decision of the governmental agency and the national accounts department. The account methodology is established under the control of a monitoring group by a interdisciplinary team comprising specialists of the field, managers and statisticians, and national accountants who provide methodological experience of the organization and knowledge of structuring of information systems. Each account thus has its own history and particularities. However, on the basis of accumulated experience, common characteristics can be defined.

Satellite accounts are drafted with a threefold aim in mind:

- (i) To analyze the organization of production and its financing in the field under consideration. Production has a wider scope than that adopted in the central framework.
- (ii) To measure the corresponding total financial appropriation. From this point of view the satellite account examination constitutes a functional approach generalized to the national economy.
- (iii) To improve and to structure the data on results and beneficiaries of activities undertaken in the field concerned.

(a) *Field and Scope of a Satellite Account*

The scope of a satellite account is defined by five components. First, by identification of the "characteristic" activities² of the field and by the addition of a set of "allied" goods and services of which only the financing and the use will be described.

²These activities are described through their financing, their production costs and the domestic use of "characteristic" products. Among the characteristic activities, administration, specialized research and development and training always appear.

Second, it is necessary, in particular in transfers, to list the expenditure which is to be traced and it is to be typified so as to obtain a valid functional analysis regardless of which agency makes the transfers.

Third, a list must be composed of institutions or persons bearing the cost of the expenditure (or allocating the financing, cf. paragraph 3(c)(ii)), namely the financers, and to group them in a financers' nomenclature.

Fourth, the agencies "effecting" the expenditure must be listed and the production units must be defined. Reference is made, for example, to complete institutional units or to establishments for operators whose main activity is "characteristic" of the field, and to "associated activity units"—a homogeneous production unit or an internal unit not described by the central framework—if the function described is secondary or ancillary to the institutional unit concerned. The results of this type of analysis can lead to different solutions depending on the satellite accounts.

Fifth, the results must be valued in monetary or physical terms, and the beneficiaries of the field are to be designated and classified. The community as a whole is shown among the beneficiaries for unindividualized expenditure.

In each of the five components, identification of the characteristic activities and listing of their products and of the allied goods and services; typology of the transfers; listing of the financers; listing of the agencies effecting the expenditure; and analysis of the results and the beneficiaries, specific classifications must be created for the satellite account concerned.

These classifications have five common characteristics:

- they are linked up with the central framework classifications;
- they are more detailed than the latter within the field concerned;
- they are often brief outside the field and thus less detailed than those of the central framework;
- outside the field, they do not intend to exhaustively describe the flows or stocks, but only to complete the data relating to the units described in the satellite account field;
- when necessary, they allow departing from the concepts of the central framework: in particular it is not the production concept but that of expenditure which is behind satellite accounts (Lemaire, 1987); this means that the production of a satellite account can cover a different field than that of the central framework;

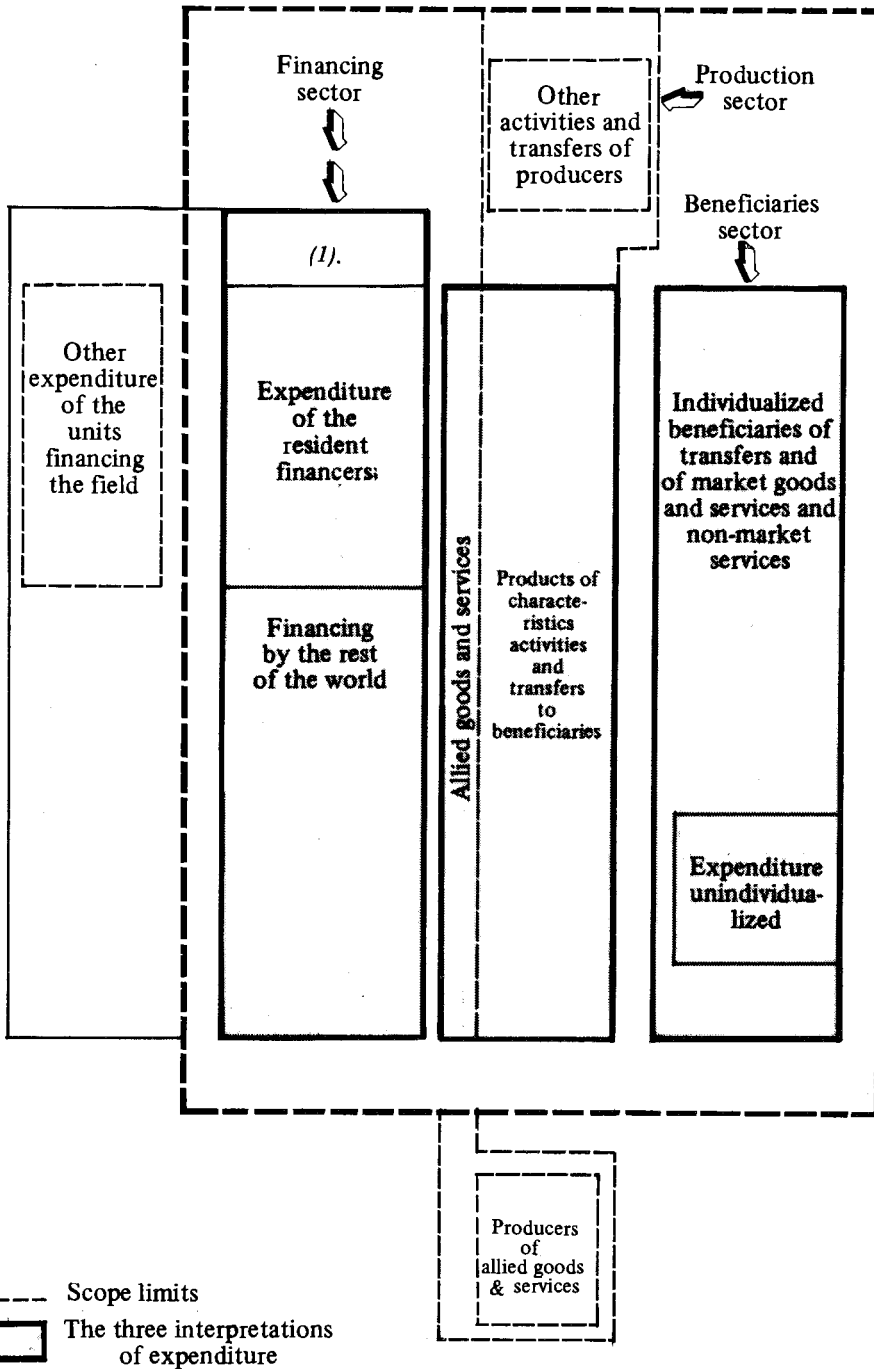
The scope covered by a satellite account (cf. Graph 2) can extend beyond the field considered:

- indeed, the expenditure of financers is described in all its forms, even though parts are outside the referenced economic territory;
- in certain cases, the characteristic institutional units which have other activities are described in their totality.

The satellite account field (cf. Graph 3) is wider than that of the economic statistics envisaged in 3(a). In a general manner, two additional categories of data are included:

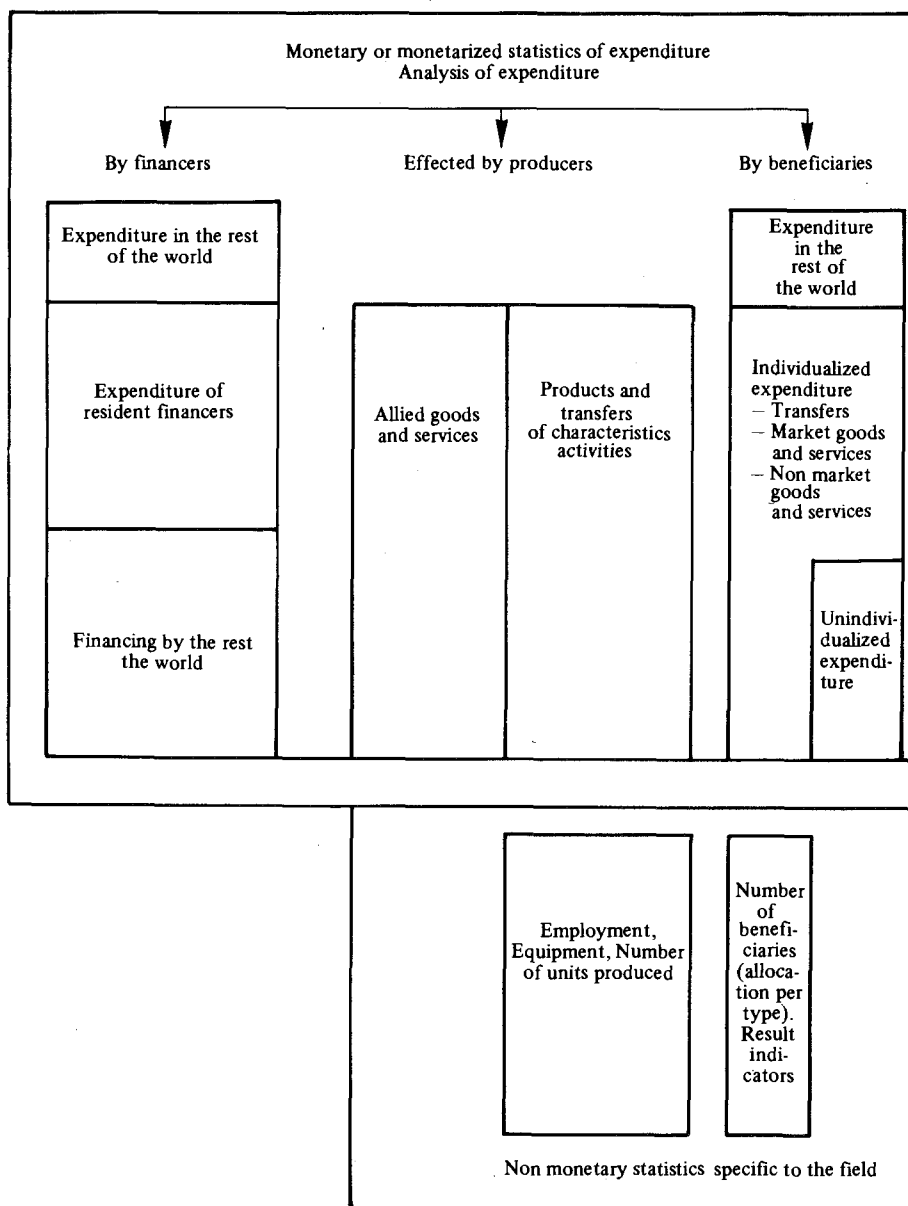
- data on employment, qualifications and the activity of the personnel employed in the production sector; data on the equipment utilized and occasionally data on production capacities (for example, reception capacities);

GRAPH 2 – THE SATELLITE ACCOUNT SCOPE



(1) The expenditure of the resident financiers include that made in the rest of the world, represented in the rectangle with (1).

GRAPH 3 – SATELLITE ACCOUNT FIELD



The threefold interpretation of expenditure is to be noted and the sought linkage of all the satellite account around a unified definition of expenditure.

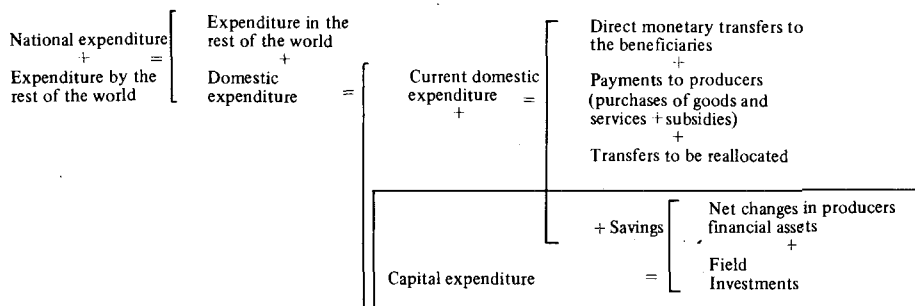
—data on the beneficiaries of the field activities, or on the benefits drawn from the field activity.

The last category of data has the most pronounced experimental character in the satellite accounts compiled at present.

(b) *Notions of National Expenditure and Domestic Expenditure*

Expenditure in the field (Table 4) includes actual expenditure for the characteristic products of the characteristic activities, the allied goods and services and the specific transfers to the field.

GRAPH 4



- Since we are not in a closed economy, it is necessary to distinguish between:
- field national expenditure = sum of the expenditure of the resident financiers, whether this expenditure is made domestically or in the rest of the world;
 - field domestic expenditure = sum of the financing received by resident producers for the characteristic goods and services; the expenditure made domestically for the allied goods and services and transfers received by the resident beneficiaries.

(c) *The “Monetary” Analysis Scheme*

In order to describe the field economy, it is necessary to show how expenditure is used, how it is financed and who the beneficiaries are. For this purpose, three sectors are isolated: a production sector, a financing sector and a beneficiaries sector.

(i) *The Production Sector*

The production sector is constituted by establishments or institutional units (in the same sense as in the central framework) whose main activity is a field characteristic activity (the non-characteristic activities of these units are analyzed more briefly, like “other activities” of the production sector), but it also groups parts of units, for example:

- homogeneous production units belonging to establishments or institutional units whose main activity is not a field characteristic activity;
- internal units not described by the central framework, where their activities are not considered as being autonomous, but as auxiliary functions at the service of the institutional unit to which they belong.

In the central framework, the expenditure which corresponds to the internal units is classified as the production costs of the main activity of the unit described.

Thus, in the central framework, industrial medicine or personnel training centre services, within an industrial company, are not isolated; their costs are included directly in those of the corresponding (market) industrial activity. In a satellite account these activities, as well as their costs, are isolated.

Similarly, military health, research and training are grouped by international convention with national defense activities in the central accounts; in the satellite accounts, they are respectively integrated in the field of health, research and training.

Finally certain complex activities combine educational, sanitary and social action aspects. In the central framework these activities are classified in a single column on the basis of their main character. Since each of the satellite accounts seeks to isolate all the costs corresponding to its field, each aspect is listed fully even if the expected benefits extend beyond an individual field.

In all these cases, the associated production derived from these non-isolated activities is not sold on the market as a specific good or service (health, training, etc.). It is valued by convention by the sum of the production costs, in the same way as the central framework specifies non-market productions. Thus, market and non-market categories are to be found in the satellite accounts: but the non-market activities have a wider content since they cover both the non-market production of the central framework and the associated production derived from all the sectors of the national economy (non-market production within the market sphere).

(ii) The Financing Sector

The financing sector is constituted by the disaggregation of the institutional units which bear the financing costs of the field either directly, or through transfers.

The account of the financing sector and the financing agencies which compose it is established from the sole point of view of financing. In the financing institutional units, it is thus necessary to distinguish their financing function from their expenditure effecting function: for example, the central government financing education and the central government managing non-market education services; another example is that of companies financing research work (in the national expenditure) and companies managing an internal research-development department (whose expenditure is part of the domestic expenditure).

If an agency effects expenditure, but receives income on the grounds of characteristic activities or transfers from the field, only the balance of this expenditure and this income is included in the national expenditure. In addition there are frequently transfers between the financing organizations of a satellite account field: for example between the different levels of general government, but also between producer companies which play the role of relay agencies in the reallocation of national expenditure.

It can thus be interesting to make two financing accounts appear, the first concerning the initial financing of agencies, households or enterprises, and the second concerning the final allocation of financing by agencies which contribute directly to covering the costs of producers or which directly finance the beneficiaries.³

³*N.B.* In public financing, the initial financer is the general government if the funds come from non-appropriated revenue (general budget, local taxes); it is by convention the "taxed" party if appropriated revenue is concerned.

(iii) Beneficiaries and Valuations of the Results

The third aspect of expenditure is the valuation of the results and its allocation to beneficiaries, whether the benefit is expressed in terms of transfers received, services consumed or in physical terms of “advantages.” Thus, it is necessary to distinguish between expenditure made for the benefit of individual beneficiaries and expenditure that cannot be identified individually, because it is made for society in general. Thus in the education account, all pupils and students are assumed to be the beneficiaries of the expenditure. Exceptions to the above example are educational research, the training of teaching personnel or non-teacher personnel, and the administration of the educational system of which the beneficiary is considered the “educational system” itself.

This distinction does not cover the market services non-market services distinction, which is based on the criteria of the main financer. Still in the same field, public education is at one and the same time non-market and its beneficiaries can be shown individually. Nor does this distinction cover the division of expenditure between the expenditure financed by the beneficiaries and social expenditure (Pommier, 1981).

The goods produced or the services rendered by the producers of the fields, as well as the allied goods and services, can be bought by the beneficiaries or the users. But they can also be financed by various categories of transfers: operating subsidies to market producers which lower sales prices, direct transfers to users, non-market financing by the general government or free supply by private non-profit institutions.

Social expenditure therefore consists of the sum of the transfers defined above, which are the total or partial counterpart of goods and services, and specific cash transfers paid directly to the beneficiaries. This practical definition of social expenditure refers to a notion of collective coverage of expenditure and not to a hypothetical differentiation between the economic and social realities.⁴ Thus, for example, all the central government subsidies to the railroads are transport social expenditure.

All the other analyses relating to beneficiaries and in particular valuation of the results of expenditure are specific to each satellite account.

(iv) Current Expenditure and Capital Expenditure

National expenditure in a field can be divided into current expenditure and capital expenditure. This separation takes into consideration the economic nature of the means of financing the field. It is therefore made from the point of view of financers.

Current expenditure is constituted by the means of financing which do not directly influence the balance-sheet accounts of the financing organizations and the producers: purchase of services or goods, subsidies, current transfers without a counterpart.

⁴Social expenditure in a given field is connected to the total public expenditure in the same field defined in the complementary analyses of the general government. Public expenditure, like satellite account expenditure, includes transfers to sectors other than that of the general government, direct expenditure and transfers between general government agencies. General public expenditure and satellite account expenditure have different consolidation methods for the general government internal operations, the former focusing on expenditure per nature and the second focusing on the financing cost.

Capital expenditure on the contrary represents the financing of the field by capital transfers (aids to investment and other capital transfers) or by means of financial transactions which constitute the change in financial liabilities of the producer organizations. It is thus not identified with the GFCF of the field producers.

(d) *The Accounting Scheme*

The accounting scheme relates the financing transactions, the producers accounts and the breakdown of expenditure between beneficiaries. This scheme is presented in Graph 5. Lengthy technical developments are necessary so as to describe how particular accounting balances are achieved. They are not presented here (see INSEE No. C140-141, 2nd chapter for complete developments).

Nevertheless we have indicated on the graph the origin and destination of the main financial flows. For example, the domestic expenditure (Graph 5, section 1) has to be split in four parts:

- the domestic current expenditure (*a*) and the domestic capital expenditure (*a'*) both of which are resources of the producers;
- the allied goods and services which production is not analysed;
- the direct monetary transfers to beneficiaries.

Also, the total benefit for the beneficiaries (Graph 5, section 3) is the result of:

- the use of characteristic individualised goods and services, some of which are marketed (*e*), some of which are not (*e''*);
- the subsidies to producers (*e'*) that lower prices;
- the use of allied goods and services (*b*);
- the monetary transfers, direct (*c*) or channelled through the producers (*d* for current transfers, *d'* for capital transfers).

Section 4 of Graph 5 represents what is said in paragraph 3(c)(ii) about transfers between financers.

GRAPH 5

1. Financing (Current transactions)

Financing destination Final financing sector	Characteristic activities	Allied goods and services	Monetary transfers to beneficiaries	«Domestic» Total	Rest of the world	«National» Total
– Households – Enterprises – General government – Private non-profit institutions						
National total						
Rest of the world						
«Domestic» total	a + a'	b	c	«Domestic» expenditure		

GRAPH 5 (continued)

2. Production

Current transactions		
Uses	Resources	
+ Remuneration of wage-earners + Intermediate consumption + Taxes = Operating expenditure	+ Sales of marketed goods and services + Operating subsidies + Operating transfers (non-market services and associated activities) = Operating resources	e e' e''
Transfers to beneficiaries (d)	+ Transfers to be reallocated = Domestic current expenditure effected by the producers	a
Other current expenditure		
Gross savings	+ Other resources	
= Total uses	= Total resources	

Capital-financial transactions		
Investments Transfers in capital to beneficiaries	Gross savings	
	- Transfers in capital for investment + Transfers in capital for reallocation = Domestic capital expenditure	a'
Changes in financial assets	Changes in financial liabilities	

3. Beneficiaries

Beneficiaries	Characteristic goods and services	Allied goods and services	Monetary transfers received	«Domestic» total
- Individualised	e + e'			
- Collectivity	e'			
Total	e + e' + e''	b	c + d + d'	

4. National expenditure financing transfers

Initial financier	Households	Enterprises	General government	PNPI	Final total
Final Financier					
- Households					
- Enterprises					
- General government					
- Private non-profit institutions					
Initial total					

Note: In order to make accounts balance, the treatment of investment depreciation and of loans and reimbursement of loans specific to the field must be defined explicitly.

4. FOUR EXAMPLES OF SATELLITE ACCOUNTS

(a) *The Social Protection Account* (SESPROS 1981, INSEE et SESI 1985, SESI 1987)⁵

The importance and the rapid growth of social expenditure, the numerous interconnections with public finances as well as the complexity and intertwining of the institutions and mechanisms have made it necessary to introduce a synthesis framework which coherently and homogeneously groups the statistical and financial information on the schemes and funds behind social protection.

France and West Germany were the first to provide themselves with a social budget; The Netherlands and Italy subsequently used a similar presentation. At present nearly all the European Economic Community countries supply social data which include a synthesis of expenditure. Since 1963, at the particular request of the Directorate-General for Employment, Social Affairs and Education (Commission DG V), Eurostat has undertaken a similar task at Community level.

The previous grouping of social security statistics did not allow for making a comparison between countries: the validity of the data on social insurance depended too much on the context and the period in which they were created in each country, as well as on the administrative and legal traditions. In addition, they do not ordinarily include either assistance expenditure, or employer direct benefits or "private" social insurance systems.

The following questions were raised by Eurostat from the outset: which groups of people are protected? Against what eventualities? According to what procedures? Up to what level? At what cost? As can be seen, these questions cover a field that is very close to that of satellite accounts (cf. paragraph 1(c)).

Since 1967, the Statistical Office of the European Communities has been developing this "social accounts" scheme by making methodologic and conceptual reflection phases alternate with collection phases of information (the published information series started in 1962). It is presented here in the form of a satellite account.

(i) Social Protection Functions

The scope of social protection is determined by a limited set of risks, eventualities and needs. When the latter occur, households incur costs which society helps them to bear. The areas concerned are called social protection functions.

Social protection expenditure is the sum of the financing received by the institutions managing the protection mechanisms. Social protection expenditure is thus by definition a social expenditure (Pommier, 1981).

Direct transfers between households (even more so within the same household) are not part of the considered expenditure, whether they are voluntary ("transfers" to children or parents) or non-voluntary (maintenance). The social protection account therefore traces only transfers which make a third-party agency intervene in a manner called a social protection scheme. The most important of

⁵OECD manages a Social Policy data bank which intends to become a complete satellite account of the macroeconomic national accounts.

these agencies are social security agencies which constitute an institutional subsector of the central framework.

The satellite account field is thus mainly constituted of the field of intervention by these agencies. This is why the notion of social protection functions used in the central framework and in the satellite account are identical. This is also why the social contributions and benefits of the two types of accounts receive the same definition and the same valuation. The degree of integration of the satellite account and the central framework is necessarily very important.

The functions considered are as follows:

- sickness
- invalidity-infirmity
- industrial accident and occupational diseases
- old-age (and, now, anticipated termination of activity)
- survival
- maternity
- family
- placement, guidance, mobility
- unemployment
- housing (when the aids correspond to households who receive other benefits on other grounds)
- other (poverty and other risks according to a limited list comprising, for example, aid to refugees).

By examining this list it can be observed that education is not part of the risks. Aids to households concerning this field are part of social protection only insofar as they are also linked with one of the risks of the previous list.

(ii) Social Protection Mechanisms

When risks, eventualities or needs appear, this leads to a loss of income for households, incapacity to obtain income or else an increase in the needs to be satisfied. The answer provided by the social protection mechanisms can take various forms that are analyzed in a list of types of benefits:

- social benefits in cash (identical to those of the central framework) which can be used in a totally free manner by households;
- social benefits in kind (identical to those of the central framework) which are counterpart of a final consumption of households, whether it be market or non-market (partial payments). They mainly concern health care, social action and housing, and are constituted either by the reimbursement of expenditure already made by households, or by direct payment by a third party (tiers payant);
- “other benefits in the form of services” which consist of the financing of non-market services provided free of charge or almost so by the general government or private non-profit institutions. The main benefits are public hospitalization when it is non-market and some of the benefits concern non-market social action. These benefits do not appear explicitly in the central framework;
- tax benefits which are tax exemptions and reductions linked with one of the risks, eventualities or needs of social protection. The main tax benefits

relate to abatements for dependent children. This explicit advantage given to beneficiaries has a counterpart which is an implicit contribution imposed on other categories of households (cf. Table 1). This is why evaluation of the tax benefits sets the formidable problem of the reference norm, with respect to which deductions and exemptions are measured. Thus, taxation or non-taxation of certain benefits in cash must be studied with a view to improving international comparisons. Tax benefits do not appear, on any grounds, in the central framework.

(iii) Analysis Scheme of the Social Protection Account

The analysis scheme of the social protection account is similar to that presented in Graph 5. It presents however notable particularities.

The sole characteristic activities of the field are social protection management activities. These activities consist for the most part in collecting the specific resources comprised by social contributions and the appropriated taxes and levies, and in managing benefits whether they are allocated directly to individuals or devoted to the general financing of non-market services.

The emphasis in this account is placed on the transfers part (in resources and expenditure from the "producers" accounts) whereas the analysis of production is relatively succinct.

The producers' current transactions account is presented in aggregate in Table 1 where it is recalled that the social contributions and benefits are identical to those in the central framework.

TABLE 1
SOCIAL PROTECTION AND ITS FINANCING. ACCOUNT OF ALL THE
SCHEMES

	1983
Uses	
Social benefits (R64)	937,496
Other service benefits	134,329
Tax benefits	33,254
Management costs	53,116
Other expenditure	97,842
Savings	31,254
Total	1,287,291
Resources	
—Wage and salary earners' contributions	831,866
• Employers' actual social contributions	495,882
• Employers' imputed social contributions	118,222
• Wage earners' contribution	217,762
—Contributions from independent workers	53,910
—Contributions on social benefits	7,104
—Other contributions	1,499
—Appropriated taxes and levies	38,884
—Public contributions	191,073
—Counterpart for tax benefits	33,254
Subtotal: Social Protection national expenditure	1,157,590
Other current income	129,701
Total	1,287,291

Note: Figures are represented in millions of current francs.

Source: SESI 1987.

The same account can be produced for each of the social protection schemes. It includes in addition a presentation of financing transfers between social protection schemes. A social protection scheme is an institution or a part of an institution which provides a social mechanism to cover the risks defined in paragraph 4(a)(i).

(iv) The Units Concerned Are (cf. Table 2):

- the institutional units whose main function is characteristic of the field. They all belong either to the social security subsector, which is entirely covered, or else to a private insurance subsector in which the premiums or contributions are not proportioned to the risks.
- the units having associated activities, in other words managing a social protection scheme within an institutional unit of which it is not the main function. The most important schemes are direct schemes providing legal benefits for certain categories of general government national enterprise wage-earners. In the central framework these schemes are mainly shown by means of imputed social contributions. These units also group employers' schemes financed in the same manner to ensure extra legal benefits, and the general government or private institution social intervention schemes which provide social benefits of the "assistance" type not linked to an insurance circuit.

The analysis of beneficiaries is made benefit by benefit in specific tables. It allows breaking down benefits by social and occupational categories in the complementary analyses of the "Households" sector. This analysis should be completed by an aggregated analysis, of the micro-economic type, of social protection transfers, in particular of the old-age-survival assurance field in which the simultaneous drawing of basic benefits and various complementary benefits is frequent.

Table 1 groups the financing by nature. The analysis by financing is not explicit, but is apparent in this table:

- social contributions (actual and imputed) are considered borne by the person protected, out of his occupational income. They are broken down by actual financer (wage-earner, employer, non-salaried worker, who is the "initial financer" in the satellite accounts terminology;
- appropriated taxes and levies are to be borne by the economy collectively; the account does not seek to determine any further the units to which these costs are finally passed on;
- other public contributions are borne by the general government (these contributions mainly consist of transfers paid by the central government to schemes showing a deficit). Indeed, contrary to the appropriated taxes and levies, they are financed from the general budget of the payer;
- tax benefits are considered as an inter-households' reallocation of the weight of income tax, without its yield being affected.

(b) *The Education Account*

Education expenditure should cover current expenditure and capital expenditure between which it can be subdivided (Carrère et Daumont, 1976). The

TABLE 2
CLASSIFICATION OF SOCIAL PROTECTION SCHEMES

Schemes	Characteristic Activities		Associated Activities			
	Social Security	Private Insurance	General Government, Employer	Other Employers	General Government, Supervisory Authority	Private Non-Profit Institutions
<i>Basic schemes</i>						
National schemes	×				×	
General schemes	×					
Special schemes						
• Statutory schemes			×	×		
• Other professional schemes	×			Public enterprises		
• Political events and natural calamities	(with autonomous funds)			×		
• Other				Managed by enterprises	×	
Voluntary schemes (1)	× (secondarily for the funds)	×				
<i>Complementary or additional schemes</i>						
National schemes	×		×			
General schemes						
Special schemes						
• Statutory schemes	×	×				
• Other professional schemes	×	×		×		
Voluntary schemes (2)	×	×				
<i>Other social protection activity schemes</i>					×	×

Note: Only the most frequent cases have been listed.

¹“Social protection” presupposes that the premiums are not proportioned to the individual risks run: this insurance is of the mutual or the group-insurance type: that is taken out in a strictly voluntary, personal manner.

²Certain voluntary schemes allow people no longer obliged by law to take out insurance to continue to do so. In general, this possibility is offered in their former scheme (this is not shown here), in national or general scheme funds for the basic coverage or in mutual societies which are part of the insurance institutional sector.

national education expenditure should be broken down between domestic expenditure and expenditure in the rest of the world (schools and other types of training abroad). In addition it is necessary to identify domestic expenditure financed by the rest of the world: these flows should trace the expenditure made in the foreign governments training centres and the expenditure of foreign students who, in the central framework, become residents of the economy in which they study.

(i) Producers Point of View

Analyzed, from the point of view of producers, training expenditure concerns:

- school-type training activities (normal and special first degree, normal and special second degree, apprenticeship, higher education, artistic education) or out-of-school activities (in particular enterprise or administration training centres and private producers of out-of-school education); these activities can be linked together according to the CITE (International Standard Education Classification).
- related activities which group the general administration of education, guidance, cantines and boarding schools, school medicine, research in education, school and university libraries (thus excluding “public reading” libraries). It is to be noted that the related activities are sometimes already described in other satellite accounts: school medicine in the health account, research in education in the research account, etc.

Education expenditure would also cover the allied goods and services which comprise school supplies and specialized school books, and specific expenditure such as the remuneration of educational personnel being trained (which is often under contract with its future employer).

Thus defined, education expenditure would not comprise the cost of meals at home, family housing and current clothing expenses. It does not measure the total cost of student maintenance. The scope of the training account has been limited to analysis of the economy of institutions linked with education.

(ii) The Financers

The classification of final financers includes (cf. Table 3).

- the national Ministry of Education;
- local authorities;
- other general government agencies;
- enterprises;
- households.

The breakdown of financing is different from one country to another, like the breakdown of responsibilities between the central government and the other public bodies. The share of expenditure borne by households and enterprises (apprenticeship and continuing education) is also variable.

The account could include a transfer table between financers to describe in particular school and university scholarships paid to households (but not all the family function social benefits) and to show investment aids linked with school constructions.

TABLE 3
EDUCATION SATELLITE ACCOUNT EDUCATION EXPENDITURE (CURRENT AND IN CAPITAL) PER FINANCING SECTOR, 1980

	Goods and Services															
	Related Activities					Allied Goods and Services										
Final Financers	1st Degree Education	2nd Degree Education	Apprenticeship	Higher Education	Artistic Education	Other School Type	Out-of-School Type Training	Total Education	General Administration	Cantines Boarding School	School Medicine Guidance	School Transport	School Supplies and Books	Clothing School Leisure	Remuneration of Educational Personnel Being Trained	Total Domestic Expenditure of Education
National education																
Ministry	22,478	56,149	766	14,675	—	—	1,104	101,172	3,164	6,394	1,598	767	177	—	2,293	115,565
—Ministry budget	9,744	14,340	—	3,782	—	—	165	28,031	909	1,882	350	—	—	—	975	32,147
—Related social contributions	38,222	70,489	—	18,457	—	—	1,269	129,203	4,073	8,276	1,948	767	—	—	3,268	147,712
—Total	91	2,871	48	3,206	464	—	9,317	15,997	905	659	83	21	—	—	—	17,665
Other Ministries																
Central government total	38,313	73,360	814	21,663	464	—	10,586	145,200	4,978	8,935	2,031	788	177	—	3,268	165,377
Local authorities	24,035	4,792	51	482	1,648	—	228	31,236	127	4,010	488	2,628	—	—	—	38,489
Other general government agencies	—	228	67	320	—	—	216	831	27	46	50	—	—	—	—	954
Total general government	62,348	78,380	932	22,465	2,112	—	11,030	177,267	5,132	12,991	2,569	3,416	177	—	3,268	204,820
Enterprises	—	1,384	1,006	1,425	2	100	7,983	11,900	—	236	19	—	—	—	—	12,155
Households	845	1,500	—	1,006	26	982	4,995	9,334	—	10,415	12	171	6,201	2,774	—	28,927
General total	63,193	81,264	1,938	24,896	2,140	1,082	24,008	198,521	5,132	23,642	2,600	3,587	6,378	2,774	3,268	245,902

Source: Lemaire and Peano, 1987.

Note: Domestic Education Expenditure = 245,902 billion francs.

(c) *The Research Account*

Research-Development has long been a strategic indicator of the long-term economic evolution of industrialized countries⁶. Thus knowledge of the field has been the subject of many national and international investigations.

The reference methodology for all these works was framed by the OECD and has been published since 1963 in the successive versions of a manual including “a standard method proposed for surveys on research and development,” universally known as the “Frascati Manual” (see references).

The OECD groups data for enterprise research expenditure on an annual basis; Eurostat does so for public financing (on the basis of budgets: the satellite account should trace the effective expenditure). In order to obtain better analysis of the research economy, these data can be presented in the form of a satellite account linked to the classical national accounts input-output table (INSEE No. C85, 1979).

(i) *Account Scope*

The field concerned by the satellite account is the experimental research and development activity as described by the Frascati Manual: “Creative works undertaken systematically with a view to increasing the sum of knowledge of man, culture and society, as well as the use of this sum of knowledge for new applications.”

Research-Development includes three activities: fundamental research, applied research and experimental development. No allied goods and services are included in the research field, all the products used (materials, supplies), are of intermediate consumption or investment.

The field includes two essential limits:

—widespread research is excluded from it;

—taking account of the definition of experimental development, social science research is limited to fundamental research and applied research.

But the boundaries must also be clearly stated with respect to training (in particular the boundary between scientific higher education and fundamental research . . .), technical studies and currently practised controls and tests.

(ii) *National Expenditure and Domestic Expenditure*

The Research-Development national expenditure (RDNE) groups all the expenditure devoted by the national economy to experimental research and development. In the central framework, this expenditure takes the form both of non-explicit internal costs (financing of a research service) and intermediate consumption (signing of research contracts) or subsidies paid to research centres by the general government.

In order to take account of the progressive internationalization of research, the existence of international programs and an international research services market, national expenditure on research recognizes the national financing of

⁶The expressions research, experimental research and development, research-development, or the abbreviation R.D. have an equivalent meaning in this section. This expenditure includes both current expenditure and capital expenditure.

these programs and the purchases of research services from the rest of the world. The financing sectors chosen are enterprises and quasi-corporate enterprises (including credit and financing institutions and insurance enterprises), higher education, other general government agencies, private non-profit institutions and the rest of the world. Households do not directly finance research expenditure.

The Research-Development domestic expenditure (RDDE) plays a central role in the satellite account, because it is related to the analysis of production factors devoted to research. It is calculated by subtracting from the RDNE the financing of the international programs and the purchases of Research-Development services from the rest of the world and by adding the financing by the rest of the world of the Research-Development made in the economic territory. The Research-Development domestic expenditure can be divided into the research production sectors.

(iii) The Producers

The agencies constituting the production sector are the units concerned with research and development: on the one hand, homogeneous production units in non-market or market research branches, and on the other hand, associated activities not isolated in the central framework.

In this case, it is a matter of the production of Research-Development services by non-specialized companies mainly making Research-Development for their own account. These units are considered in the satellite account as composing "Research-Development branches" associated with the current production branches. In the "Input-Output Table" of the national accounts central framework, only the incidental sales of research and development services by these integrated units are isolated.

(iv) Analysis of the Expenditure

The Research-Development domestic expenditure is analyzed on the basis of four criteria that are specific to the field:

- Per attachment branch, in which the associated internal activities are classified in the branch to which they are attached and the specialized units are reclassified in the branch they serve. For this last case, a transition table between the satellite account and the central framework classifications is computed.
- Per type of research, distinguishing between fundamental research, applied research and experimental development;
- Per research field (combination of scientific disciplines and objectives);
- Per research objective as a function of a list defined by the European Communities: the NABS (Nomenclature for the Analysis of Scientific Budgets). In a first stage this analysis is limited to financing of research expenditure by the general government.

The research account develops the analysis of the main production factor: research personnel. The latter is analyzed at the same time as the Research-Development domestic expenditure into: categories of employment (researchers-engineers, technicians, workers, administrative staff) and qualification levels. A full time equivalent unit is used for personnel making research only part time.

A research equipment account would be of great interest.

(d) *Health Account* (OECD—Health in figures, “Economie et Santé 1972, and SESI, mars 1987)

The analysis of health expenditure must fit into a general analysis of social policies, in interrelation with economic policies (Foulon, 1982).⁷ The natural link is the use of the macro-economic accounting framework in the national accounts. However, this framework offers a copious set of rules, definitions and valuations, which must be completed. The data grouped by OECD under the name “health in figures” can serve as a basis to compile a satellite account in this field.

(i) Scheme of Health Accounts

The analysis scheme of the account proposed for health is in conformance with the general framework of satellite accounts, distinguishing between financing sectors, production sectors and beneficiaries.

The financing sectors are mainly the “Social Security funds” sector, fraternal societies which are part of the insurance institutional sector, and households.⁸ Central government agencies may act both as financers on non-market activities other than hospitalization and certain associated activities, and as distributors of social benefits (medical aid). Similarly enterprises intervene as financers of certain market or associated activities (industrial medicine).

The production sector groups all the establishments or fractions of establishments with a field characteristic activity, namely medical care establishments or services, sanitary prevention, education, medical research and the general administration of health. The pharmaceutical industries activity is not part of the characteristic activities of the health field as defined for the satellite account.⁹ On the contrary, pharmaceutical products, other medical goods (medical glasses and prostheses) and patient transport services constitute the allied goods and services of the field of which the domestic uses are shown.

Thus the essential linkage of health goods and services is not based on the division between characteristic goods and services and allied goods and services, but on the separation between the “total medical consumption,” composed of medical care and goods and preventive medicine on the one hand and the expenditure on research, training, health benefits management, and health administration on the other hand.

Total medical consumption for France in 1980 is presented in Table 4. It should be noted that ambulatory care includes “external” consultations in hospitals, and that the transport of patients, medicines and prostheses are the account allied services (the allied goods and services do not belong to the present OECD

⁷Curiously, no comprehensive definition of “health care” has evolved from the wide range of analysis on the topic.

⁸In certain countries, the general scheme system is managed directly by the central government.

⁹This choice is based on the idea that the study of the pharmaceutical industry is more closely related to the neighbouring industrial activities than to care activities. Its study is undertaken mainly within the framework of the enterprise sector account and the branch accounts in the input-output table.

TABLE 4
TOTAL MEDICAL CONSUMPTION
(Production-consumption point of view)

Medical care and goods	1980
1. Hospital care	96,940
2. Ambulatory care	54,643
—Doctors	27,492
—Medical assistants	5,920
● nurses	(2,504)
● masseurs-kinesitherapists	(3,067)
● others	(349)
—Dentists	13,804
—Analysts	5,460
—Hydrotherapy	1,967
3. Transport of patients	1,985
4. Medicines	33,687
5. Prostheses	3,720
—Spectacles	(2,658)
—Orthopedics	(1,062)
Total Consumption of Care and Medical Goods (1 to 5)	190,975
6. Preventive medicine	6,762
—Industrial medicine	(2,653)
—School medicine	(920)
—Mother and Child Health Centres	(889)
—Mental diseases	(1,142)
—Toxicomania	(70)
—Family planning	(62)
—Other and non-subdivided	(1,026)
Total Medical Consumption	197,737

Source: SESI, 1987.

Note: Figures represent millions of francs.

aggregate which does not either trace the expenditure borne by producers, e.g. industrial medicine or privately financed preventive medicine services).

A complete producers' account of a usual type can be drawn up. It is not presented here.

Analysis of the beneficiaries is made from four viewpoints: the sick, prevention, the "care system" (which absorbs medical and pharmaceutical research) and management. The current French domestic expenditure, and the 1980 expenditure per beneficiary, is presented in Table 5.

This table can be completed by showing the expenditure per "initial" financer and per "final" financer and by showing the expenditure for the beneficiaries by age bracket, social and occupational categories

(ii) Junction with the Central Framework

A complete junction of the account is made with the central framework, towards the input-output tables for the elements concerning production and consumption and towards revenue-expenditure accounts for analysis of financing. This last junction is partly described in the three last columns of the Table 5, according to the analysis of OECD's "Health in Figures."

TABLE 5
CURRENT HEALTH EXPENDITURE PER NATURE, 1980

	1980	FCEH ¹	CHEG ¹	Other Expenditure
11. <i>Medical care and goods expenditure</i>	190,300			
Care for individuals:	152,477			
—Hospital care	95,849			
• public	(77,457)	Partial payments	× ²	
• private	(18,392)	Net disbursement	Benefits in kind	Private insurances
—Ambulatory care	(54,643)	Idem	Idem	Idem
—Transport of patients	(1,985)	Idem	Idem	Idem
Care to collectives (armies, prisons)	416			
Medicines	33,687	Net disbursement	Benefits in kind	Private insurances
Other medical goods	3,720		Idem	Idem
12. <i>Allied services expenditure</i>	NA			
13. <i>Aid for patients</i>	19,302			
• Income replacement benefits	NA		×	P
• Assistance for patients	NA		×	PNISH
14. <i>Subsidy for the care system</i> (indirect aid for patients)	893			
For doctors (social contributions subsidies)	854		×	
For private hospitals and care centres	39		×	
1. Subtotal: Expenditure for patients	210,495			
21. <i>Preventive medicine expenditure</i>	6,762			
Industrial medicine	2,653			Employers
School medicine	920		×	
PMI (Mother and Child Health Centres)	889		×	
Mental diseases	1,142		×	
Toxicomania	70		×	
Family planning	62		×	
Other and non subdivided	1,026		×	
22. <i>Collective prevention and sanitary control expenditure</i>	680		×	P PNISH
2. Subtotal—Prevention expenditure	7,442			
31. <i>Medical and pharmaceutical research expenditure</i>	2,887		Public centres	Private centres
32. <i>Doctors, pharmacists, nurses and medical assistants training expenditure</i>	2,104	Partial payments	×	
3. Subtotal—Expenditure for the care system	4,891			
41. <i>Management of sickness benefits</i> (Social security and mutual societies)	NA		×	×
42. <i>General administration</i>	NA		×	
4. Subtotal—Health management expen- diture and its financing	2,592			
General Total—Current health expenditure	225,420			

Note: Figures represent millions of francs.

¹OECD: FCEH—Final consumption expenditure of households. CHEG—Current health expenditure of general government.

²×: Main or exclusive financing.

³Private nonprofit institutions serving households.

According to French institutional arrangements:

- the medical care and goods expenditure corresponds to individualized final consumption of government (public hospitals) and to final consumption of households. Care to collectives (e.g. armies and prisons) is not explicitly distinguished from the function to which it is ancillary in the central framework;
- the aid for patients corresponds to cash social benefits;
- the subsidy for the care system belongs to the subsidy item of the central framework;
- the preventive medicine expenditure has to be divided between government consumption (mental diseases, etc.) intermediate consumption (industrial medicine) and different kinds of transfers;
- the collective prevention and sanitary control expenditure is only made of government final expenditure;
- the research and the training expenditure belongs to all types of uses (final or intermediate, private or public, consumption) depending on the way it is financed;
- health management expenditure is constituted of both final consumption of central government and of social security funds and final consumption of households corresponding to private insurance schemes.

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