

CERTAIN PROBLEMS IN THE IMPLEMENTATION OF  
THE INTERNATIONAL SYSTEM OF NATIONAL  
ACCOUNTS 1993—A CASE STUDY OF CANADA

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The international System of National Accounts 1993 (1993 SNA) was implemented in Canada in November 1997, but with some modifications. Our occasional departures from the 1993 SNA affect the overall GDP only marginally and are primarily in the sector details. This paper provides a brief description of some of the most important differences still remaining between the 1997 Canadian System of National Accounts and the 1993 SNA. It will be very useful to know if other countries have faced or are facing similar problems in their implementation of the 1993 SNA. A collection of such reports from many countries will provide us very useful and rich source material for possible changes in the future version of the international SNA.

The international System of National Accounts 1993 (1993 SNA) was published in 1993. Canada implemented the 1993 SNA in 1997, one of the first countries in the world to do so. Australia and the United Kingdom implemented the 1993 SNA in 1998. Other member countries of the European Union are planning to implement the 1993 SNA in the first quarter of 1999. Over the next couple of years, most countries will implement this new standard, keeping in view their institutional structure and statistical development.

The 1997 Canadian System of National Accounts (CSNA) has incorporated the 1993 SNA guidelines, but with some modifications. Our occasional departures from the 1993 SNA guidelines are primarily prompted by pragmatic considerations, such as institutional structure, statistical data sources, availability of resources and their cost-effective use. We fully recognize the importance of promoting international comparability, but it should also be recognized that the specific circumstances existing at a given time in different countries can vary, often substantially. This paper examines the 1997 CSNA and highlights the remaining differences from the 1993 SNA, thus providing a better understanding of the Canadian system vis-à-vis that of other countries.

The recent CSNA document: "The 1997 Historical Revision of the Canadian System of National Accounts—Record of Changes in Classification of Sectors and Transactions, Concepts and Methodology," issued in 1998, points out that the CSNA is identical, for most of the significant areas, to the 1993 SNA. The CSNA is a fully integrated and comprehensive system, as is the 1993 SNA. The CSNA carries the full slate of the sequence of interlocking accounts described and recommended in the 1993 SNA. The CSNA starts with the production

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account with value added as a balancing item; the income and outlay account with saving as a balancing item; the capital account with net lending as a balancing item. It then describes in its financial account all the financial instruments required for the capital account. Periodic investments accumulated over a period are shown in the balance sheet accounts. Only a handful of countries have advanced as far as Canada in producing the complete system of accounts recommended in the 1993 SNA.

The CSNA also corresponds to the 1993 SNA in another important sense, namely, that input–output tables form an integral part of the production accounts. Statistics Canada has produced annually, starting with the reference year 1961, product by industry input–output tables (also referred to as make and use matrices) in both current and constant prices. The most recent input–output tables are for the year 1995. Starting with the reference year 1996 and annually thereafter, Statistics Canada will also produce input–output tables for each of the 12 provinces and territories of Canada. Canada will be the first country to produce both national and provincial input–output tables with an annual frequency.

Our comparisons are organized following the order of the 1993 SNA chapters. In this paper we highlight only the most important of the remaining differences between the CSNA and the 1993 SNA. The purpose is to convey a good understanding of what the differences are and why are they being maintained. Such an understanding should help us improve future versions of both the CSNA and the international SNA.

## I. MUTUALLY EXCLUSIVE SECTORS

The 1993 SNA defines an institutional unit “as an economic entity that is capable, in its own right, of owning assets, incurring liabilities and engaging in economic activities and in transactions with other entities” (paragraph 4.2). The resident institutional units that make up the total economy are grouped into the following five mutually exclusive sectors (paragraph 4.6):

- (i) the non-financial corporations sector;
- (ii) the financial corporations sector;
- (iii) the general government sector;
- (iv) the non-profit institutions serving households (NPISHs) sector;
- (v) the household sector.

In the CSNA, the sector accounts follow a different aggregation. The financial corporations sector is combined with the non-financial corporations sector to form the “corporations and government business enterprises sector” or, in short, “the corporate sector.” The government sector is very similar to the one in the 1993 SNA. The CSNA’s persons and unincorporated businesses sector is an aggregation of the 1993 SNA’s NPISHs and household sectors. These three sectors are used for the income and outlay account, the capital and financial account and the balance sheet account but not for the production account. The capital and financial account as well as the balance sheet account provide separately for the non-financial corporations sector and the financial corporations sector, but no such separation is available for the income and outlay account. In the CSNA’s production account, all the producing units in the household sector are combined

with those in the corporate sector and this merged sector is called “the business sector of the Canadian economy.”

This modification in the CSNA derives from the fact that the surveys conducted for estimating production or shipments by product, and inputs by product, typically use the establishment as the smallest unit of observation. The legal consideration that the establishment is incorporated or unincorporated is of secondary importance for statistical data. The detail on outputs and inputs by sector, even when it is available for certain industries, is of quite inferior quality for use in the production account.

## 2. QUASI-CORPORATIONS

Quasi-corporations are unincorporated enterprises that function as if they were corporations. The 1993 SNA, like the 1968 UN SNA, recommends that for sectoring purposes, quasi-corporations be treated as if they were corporations. In the 1993 SNA (paragraph 4.50), three main kinds of quasi-corporations are recognized:

(a) Unincorporated enterprises owned by government units which are engaged in market production and which are operated in a similar way to publicly owned corporations. In the CSNA, such quasi-corporations are called government business enterprises and are included in the corporate sector, a treatment similar to that of the 1993 SNA.

(b) Unincorporated enterprises, including unincorporated partnerships, owned by households which are operated as if they were privately owned corporations. In the CSNA, there is no recognition of quasi-corporations owned by household. All unincorporated enterprises owned by households are added to persons to form the persons and unincorporated businesses sector for the income and outlay account, capital and financial account and balance sheet account. In the production account of the CSNA, these entities are added to the corporate sector to form the business sector.

(c) Unincorporated enterprises which belong to institutional units resident abroad. Such units are included in the corporate sector in the CSNA, a treatment similar to that of the 1993 SNA.

## 3. GOVERNMENT SECTOR

In the 1993 SNA (paragraph 4.113), the government sector consists of the following group of resident institutional units:

- (a) All units of central, state or local government;
- (b) All social security funds at each level of government;
- (c) All non-market non-profit institutions (NPIs) that are controlled and mainly financed by government units.

The sector does not include public corporations, even when all the equity of such corporations is owned by government units. These corporations form part of the corporations sector.

The CSNA follows the same rules as the 1993 SNA for allocating units to the government sector, but with one modification relating to NPIs. We do not

differentiate NPIs controlled and mainly financed by government units from NPIs mainly financed by government units. Control is a nebulous phenomenon and we have no hard information with which to measure it. Thus we have classified all those NPIs mainly financed by government units in the government sector, irrespective of the level of control.

#### 4. HOUSEHOLD SECTOR

In the 1993 SNA (paragraph 4.151), “the household sector consists of all resident households. Defined as institutional units, households include unincorporated enterprises owned by households, whether market producers or producing for own final use, as integral parts of those households.” The persons and unincorporated businesses sector of the CSNA relating to the income and outlay account, the capital and financial account, and the balance sheet account approximates to the definition of the 1993 SNA with one exception that the CSNA sector also includes NPISHs. In the production account, as noted above, all producing units of the household sector are merged with the corporate sector to form the business sector of the Canadian economy. Thus in the Canadian production account, the household sector is not separately identified. Our departure from the 1993 SNA guideline is due to the method with which production surveys are currently conducted. The legal identification of the producing establishment as unincorporated or incorporated is of secondary importance for industrial statistics. Thus the detail on outputs and inputs by unincorporated sector, even when available for certain industries, is of quite inferior quality to produce the production account for the household sector.

#### 5. NPISHs

The 1993 SNA (paragraph 4.161) states: “Non-profit institutions are legal entities created for the purpose of producing goods and services whose status does not permit them to be a source of income, profit or other financial gain to the units that establish, control or finance them.” Some NPIs charge prices and fees that are economically significant. The 1993 SNA defines significant prices as “prices which have a significant influence both on the amounts the producers are willing to supply and on the amounts purchasers wish to buy” (paragraph 4.161). NPIs which charge significant prices are typically part of the corporate sector. The majority of NPIs, however, are likely to be non-market producers that provide goods or services to other institutional units either free or at prices that are not economically significant. NPIs which are non-market producers and are mainly financed by the government are allocated to the government sector; those that are not allocated to the government sector are called non-profit institutions serving households (NPISHs).

The definition of NPISHs in the CSNA is very similar to the one in the 1993 SNA. However, the NPISHs sector is not separated from the household sector for the income and outlay account, the capital and financial account, and the balance sheet account in the CSNA. In the production account, detailed estimates

for outputs and inputs are made separately for all the three sectors of the Canadian economy—business, government, and NPISHs.

## 6. SECTOR ACCOUNTS

This section summarizes the sector accounts in the 1993 SNA and the CSNA. The 1993 SNA recommends establishing the following accounts by institutional sectors:

- (a) Production account;
- (b) Primary distribution of income account;
- (c) Secondary distribution of income account;
- (d) Use of income account;
- (e) Capital account;
- (f) Financial account;
- (g) Other changes in assets account;
- (h) Balance sheet.

There is a major difference in the production account of the 1993 SNA and that of the CSNA. The business sector of the CSNA production account is coterminous with the aggregation of all the producing units of three sectors in the 1993 SNA—the non-financial corporations sector, the financial corporations sector, and the household sector. In addition, there are two other sectors of the production account—government sector and NPISHs—in the CSNA as in the 1993 SNA. The CSNA production account appears in the input–output tables.

In the CSNA, the two accounts—(b), (c)—of the 1993 SNA are combined into a single income account. Though many items are developed to articulate these two accounts, we do not have estimates for all the items and definitely not for the long time series, hence we have continued to present this combined account. Note that we have implemented the 1993 SNA beginning at the first quarter of 1961. Our users for time series data require similar presentation for the entire period. Use of income account in the 1993 SNA is quite similar to the outlay part of the income and outlay account of the CSNA. Similarly, the 1993 SNA accounts (e) and (f) are very similar to the capital and financial account of the CSNA. In the CSNA, we have several items for the other changes in assets account, but not sufficient to satisfy the full set of the 1993 SNA guidelines. The balance sheet account in the CSNA is quite similar to the one in the 1993 SNA.

## 7. HEAD OFFICE ACTIVITIES

The 1993 SNA states: “When the production of an enterprise takes place in two or more different establishments, certain ancillary activities may be carried out centrally for the benefit of all the establishments collectively. For example, the purchasing, sales, accounts, computing, maintenance or other departments of an enterprise may all be the responsibility of a head office which is located separately from the establishments in which the principal or secondary activities of the enterprise are carried out. In such a case, the costs of the central ancillary activities must be distributed to the establishments which they serve, for example in

proportion to the latter's outputs or costs, and added to the latter's own costs" (paragraph 5.29).

The 1993 SNA (paragraph 5.13) does not recognize the provider of ancillary activities such as a head office as an establishment, thus it has no output.

At Statistics Canada, head offices are identified as separate units with a geographical location to which employment and capital expenditures are assigned; for purposes of industrial classification, the whole unit is assigned to a single industry, the one in which the bulk of the value added of the establishments it serves is generated. This is how the head offices have also been handled in the Canadian national input-output tables for the 1997 CSNA Historical Revision. Though they are identified as separate units, they disappear when assigned to an industry; thus operationally, the result in the Canadian treatment at the national level is quite similar to the one proposed in the 1993 SNA.

The 1993 SNA recommendation becomes problematic when the national input-output tables or industrial statistics are produced at the provincial or regional level. At the regional level, when the head office is situated in a region different from that of the producer units it serves, the strict application of the 1993 SNA recommendation would imply no contribution of the head office to the value added of its region. This result is counter-intuitive. Hence there is a need to reexamine the 1993 SNA recommendation.

In the Canadian provincial input-output tables, we intend to modify the 1993 SNA recommendation as follows: Head office is recognized as a separate establishment and for purposes of industrial classification, the whole unit is assigned to a single industry. That industry is the one in which the bulk of the value added of the establishments is generated, as we have done for national industrial statistics. The head office produces output which is completely used up as intermediate consumption by its serving establishments, thus reducing the value added of each of its serving establishments by the amount of use of head office service. Value added for the country as a whole does not change but its provincial or regional distribution does change, reduced in some regions counter-balanced by an identical increase in the region of the head office.

The value of the output of the head office may be equated to its costs or costs plus profits. The share of profits allocated to the head office may be equated to its share of the total wages paid by the enterprise multiplied by the total profits of the enterprise. One may devise some other convention to distribute profits. In any case, our preference is that the value of the output of the head office be equated to its costs plus shared profits.

## 8. UNITS OF HOMOGENEOUS PRODUCTION

The 1993 SNA states: "For purposes of input-output analysis, the optimal situation would be one in which each producer unit were engaged in only a single productive activity so that an industry could be formed by grouping together all the units engaged in a particular type of productive activity without the intrusion of any secondary activities" (paragraph 5.46). It further states: "Although the unit of homogeneous production may be the optimal unit, . . . it may not always be feasible to partition establishments . . . into a series of mutually exclusive units

of homogeneous production. In situations of this kind, it will not be possible to collect directly from the enterprise or establishment the accounting data corresponding to units of homogeneous production. Such data may have to be estimated subsequently by transforming the data supplied by enterprises on the basis of various assumptions or hypotheses” (paragraph 5.47).

In the Canadian input–output tables (called supply and use tables in the 1993 SNA), we do not subdivide establishments to create units of homogeneous production except in the case of construction. The proponents of pure commodity technology perhaps forget that such conceptual perfection would require a separate vector of inputs for each of the twenty thousand or so commodities identified in the market. It is completely unrealistic to seek to achieve such a target. Aggregating twenty thousand commodities into a manageable set of 500–1,000 commodity groups can hardly be called generating homogeneous production units.

## 9. PRODUCTION ACCOUNT FOR INSTITUTIONAL SECTORS

The 1993 SNA recommends that there should be full production accounts for institutional units and sectors, “full” in the sense of reporting gross output, intermediate consumption, and value added (paragraphs 6.1–4). Full production accounts for an institutional sector are not necessary to analyze its income and outlay account or its capital and financial account; for such an exercise, the distribution of income flows is sufficient. Their additional utility, in the case of Canada, is questionable, especially when the very significant resources that would be required to develop such estimates for the current period are considered.

For the present, it is worth noting that the CSNA produces full production accounts for all years for which input–output tables are compiled, but the sector classification is different from that of the 1993 SNA. The CSNA produces annual input–output tables with a lag of  $2\frac{1}{2}$  years after the reference year. A business sector is created, which comprises all the producing units of the two corporate sectors and the household sector. Two additional sectors, the general government and NPISHs, produce goods and services primarily not for sale in the market but for their own consumption. All producing units of the Canadian economy are thus included in the production accounts of the business sector and the two non-market sectors.

## 10. THE PRODUCTION BOUNDARY IN THE SYSTEM

An important issue is the demarcation of the boundary for valuing production for SNA purposes. The 1993 SNA lists the following activities that fall within the production boundary of the System (paragraph 6.18):

- (a) the production of all individual or collective goods or services that are supplied to units other than their producers, or intended to be so supplied, including the production of goods or services used up in the process of producing such goods or services;
- (b) the own-account production of all goods that are retained by their producers for their own final consumption or gross capital formation;

- (c) the own-account production of housing services by owner-occupiers; and domestic and personal services produced by employing paid domestic staff.

Included in the production boundary, however, is so-called “illegal production.” Illegal production was always implicitly contained within the boundary, and in the 1993 SNA this has been properly clarified. Illegal production (paragraph 6.30) comprises. “(a) the production of goods and services whose sale, distribution or possession, is forbidden by law; (b) production activities which are usually legal but which become illegal when carried out by unauthorized producers; e.g. unlicensed medical practitioners.” Further: “Examples of activities which may be illegal but productive in an economic sense include the manufacture and distribution of narcotics, illegal transportation in the form of smuggling . . . and services such as prostitution” (paragraph 6.32). It has generally been assumed that concealed production and the underground economy form part of the production boundary. This, too, has been clarified (paragraphs 6.34–36) in the 1993 SNA.

The boundary of production in the CSNA is quite similar to the one in the 1993 SNA. A significant portion of underground or illegal production has always been *de facto* captured in the official GDP because of the data sources and the methods employed in its estimation. The method of estimating residential rents in the national accounts illustrates the point. If the method relied on the gross rents showing on tax returns, GDP could be underestimated, since landlords may declare only part of the rents received, or none at all. Gross paid rents entered in the GDP, however, are calculated through the multiplication of the stock of rented dwellings by the average rent paid by tenants, based on a sample of about 20,000 respondents to the Labour Force Survey. Measured rental income in the national accounts is independent from the declared rental income. However, we have not been able to include any value for certain well-known illegal activities such as prostitution and narcotics. This is a weakness in the estimate of Canadian production. There are simply no reliable data available to enable us to make any publishable estimates. We recognize that our implicit assumption of zero value is not correct as such activities certainly exist in the economy. We did make an estimate for international smuggling of import of cigarettes, which became quite rampant in the early 1990’s.

## 11. FINANCIAL INTERMEDIATION SERVICES INDIRECTLY MEASURED (FISIM)

Banks and other financial institutions provide a variety of services. Those that are specifically charged for include currency exchange, handling of cheques etc. and the corresponding revenues form part of the institutions’ output. An additional, and very significant, part of their income comes from charging higher interest rates to borrowers and paying lower rates to depositors than they would need to if they charged explicitly for all their services. This “hidden” charge (known as imputed banking service in the 1968 UN SNA) is called financial intermediation services indirectly measured (FISIM) in the 1993 SNA. “The total value of FISIM is measured in the System as the total property income receivable by financial intermediaries minus their total interest payable, excluding the value

of any property income receivable from the investment of their own funds . . .” (paragraph 6.125). Apart from a few differences, noted below, the approach to measuring the value of FISIM in the CSNA is quite similar to the one recommended in the 1993 SNA.

The 1993 SNA recognizes that certain countries may not be able to allocate FISIM among the various users. Thus it states: “In principle, the total output should, therefore, be allocated among the various recipients or users of the services for which no explicit charges are made. In practice, however, it may be difficult to find a method of allocating the total output among different users in a way which is conceptually satisfactory from an economic viewpoint and for which the requisite data are also available. Some flexibility has therefore to be accepted in the way in which the output is allocated. Some countries may prefer to continue to use the convention proposed in the 1968 version of the SNA whereby the whole of the output is recorded as the intermediate consumption of a nominal industry” (paragraph 6.126). We do not support this flexibility, particularly not allocating any output to final users, as advocated in the 1993 SNA. In our judgement, this last minute insertion of flexibility in the 1993 SNA was ill-advised. One of the most glaring weaknesses of the 1968 SNA was its guideline regarding the allocation of FISIM. It is to the credit of the CSNA that it has always allocated this output to users, including final users even when the 1968 SNA recommended otherwise.

## 12. FISIM ON OWN FUNDS

The 1993 SNA suggests that financial intermediaries’ own funds should not be included in the calculation of FISIM “as such income does not arise from financial intermediation” (paragraph 6.125). Contrary to the recommendation of the 1993 SNA, the CSNA includes intermediaries’ own funds in the calculation of FISIM. We believe that the borrowers of these funds receive a service from lending institutions using their own funds. We recognize that the rate of FISIM should be lower in this case as there is no service provided to the depositor of the funds, since there is no depositor.

## 13. BANK OF CANADA

The CSNA treatment of the central bank does not agree with the one in the 1993 SNA. The 1993 SNA (paragraph 6.132) states: “The services of financial intermediation provided by central banks should be measured in the same way as all other financial intermediaries.” However, since the central bank plays a very different role than other banks, a different treatment seems justified. The central bank in Canada, the Bank of Canada is unlike the rest of the Canadian financial industry. The main functions of the Bank of Canada are to: formulate and implement monetary policy, issue and replace bank notes, undertake central banking services, and manage the public debt. Only the activities associated with central banking services can generate FISIM. However, on an operating cost basis, this function was estimated to account for only 9 percent of total expenses.

At our request, ISWGNA deliberated and issued a clarification on the valuation of central bank output. In its January 1996 issue of SNA News and Notes, it is stated: "where this approach leads consistently to inappropriate results, output could . . . be measured at cost as for other non-market producers." We expect that many countries, like Canada, will now use the clarification issued by the ISGWNA, and not the original formulation in paragraph 6.132 in the 1993 SNA. Further, the entire output, calculated as the sum of costs, is allocated in Canada to the federal government sector.

#### 14. VALUE OF CONSUMPTION OF FIXED CAPITAL

The 1993 SNA recommends that "... consumption of fixed capital must be valued with reference to the same overall set of current prices as that used to value output and intermediate consumption . . . It should therefore be calculated using the actual or estimated prices and rentals of fixed assets prevailing at that time and not at the times the goods were originally acquired. The historic costs of fixed assets, i.e. the prices originally paid for them, may become quite irrelevant for the calculation of consumption of fixed capital if prices change sufficiently over time" (paragraph 6.180).

In the CSNA, consumption of fixed capital for the government sector, housing and agriculture is calculated using current prices while for other industries we use what enterprises report in their financial statements. Our departure from the recommended treatment is due to our statistical sources. At present, consumption of fixed capital is calculated by the Investment and Capital Stock Division of Statistics Canada using current market prices of fixed assets, but this information is available only by industry, based on establishments rather than by enterprises and secondly, such information is not segregated by sector.

The information on corporate profits for the CSNA, on the other hand, is available by enterprises. Thus it is not feasible to connect the value of consumption of fixed capital based on establishments with profits based on enterprises. This connection is an essential requirement for the income and expenditure accounts in the CSNA. We need consumption of fixed capital estimate by sector to use in the capital and financial accounts.

#### 15. MODIFIED BASIC PRICE VALUATION OF GOODS AND SERVICES

In the 1993 SNA, the preferred method of valuation of output of goods and services produced for the market is at basic prices, especially when a system of VAT, or similar deductible tax, is in operation (paragraph 6.218) and is defined as follows: "The basic price is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any tax payable and plus any subsidy receivable, on that unit as a consequence of its production or sale. It excludes any transport charges invoiced separately by the producer" (paragraph 6.205a).

There are taxes on products and other taxes on production; similarly, there are subsidies on products and other subsidies on production. The definition in the 1993 SNA of basic prices does not clearly state which of the two taxes and

subsidies are being referred. The definition written in the European System of Accounts, ESA 1995, (published by EUROSTAT, Brussels, 1996) clarifies it and it reads as follows: "The basic price is the price receivable by the producers from the purchaser for a unit of a good or service produced as output minus any tax payable on that unit as a consequence of its production or sale (i.e. taxes on products) plus any subsidy receivable on that unit as a consequence of its production or sale (i.e. subsidies on products). It excludes any transport charges invoiced separately by the producer. It includes any transport margins charged by the producer on the same invoice, even when they are included as a separate item on the invoice" (paragraph 3.48).

The 1993 SNA further states: "When output is recorded at basic prices, any tax on the product actually payable is treated as if it were paid by the purchaser directly to the government instead of being an integral part of the price paid to the producer. Conversely, any subsidy on the product is treated as if it were received directly by the purchaser and not the producer" (paragraph 6.206).

In the CSNA, we have not incorporated the recommended basic price in the valuation of goods and services; instead, we have modified the 1993 definition of basic price for our input-output tables. In its input-output tables, the CSNA reports taxes on products levied as a consequence of production or sale separately, as recommended; however, subsidies on products are not added to the prices; in other words, the prices recorded are the subsidized prices, not the prices plus subsidies as recommended in the 1993 SNA. The CSNA definition of modified basic price reads as follows:

"The modified basic price is the price receivable by the producers from the purchaser for a unit of a good or service produced as output minus any tax payable on that unit as a consequence of its production or sale (i.e. taxes on products). It excludes any transport charges invoiced separately by the producer." The modified basic price used in the CSNA input-output tables is equivalent to the price, say for manufactured goods, as reported at the factory gate. In the CSNA, subsidies are recorded in the accounts of those who initially receive the money, not who eventually benefit from the subsidy program. The 1993 SNA recommends, as noted above, allocating subsidies on products as if they are received directly by the purchasers. This information is not available from the records as the subsidized product is purchased by many producing units and final consumers. Had we adopted the 1993 SNA recommendation, we would report the transactions, not at prices prevailing in the market but at assumed prices, a feature that is not very appealing. GDP at market prices, per our presentation in the input-output tables is identical, both on the income side and the expenditure side, as it is in the 1993 SNA. The industrial distribution in the CSNA is, however, different from the 1993 SNA. The advantage of the CSNA approach is that the valuation of transactions is transparent and verifiable from the enterprise records, a feature not available in the 1993 SNA.

## 16. VALUATION OF INTERMEDIATE CONSUMPTION

The 1993 SNA recommends: "Expenditures on goods and services intended to be used for intermediate consumption should be valued at purchasers' prices"

(paragraph 6.220), and it defines purchaser's price as follows: "The purchaser's price is the amount paid by the purchaser, excluding any deductible VAT or similar deductible tax, in order to take delivery of a unit of a good or service at the time and place required by the purchaser. The purchaser's price of a good includes any transport charges paid separately by the purchaser to take delivery at the required time and place" (paragraph 6.215).

We have no fundamental problem with this recommendation; this is how the records are kept in the industrial surveys. However, for deriving gross value added by industry at market prices (which in total is equal to total expenditure on GDP at market prices), one needs to value both outputs and intermediate consumption at the same prices. Otherwise, incomes and expenditures in the economy will not balance. Thus, one needs to add in the 1993 SNA an aggregate of taxes less subsidies on products to the value added (derived through output at basic prices minus intermediate consumption at purchasers' prices) to balance it with GDP at market prices.

In the CSNA input-output tables, we start with the intermediate consumption at purchasers' prices. However, we then delineate each purchaser price into the following components: price charged at the factory gate; taxes on products; trade and transport margins. This formulation permits us to deflate all the components, both production and use, of a good or service in a very efficient way. We need one deflator for one commodity rather than many for the same commodity at purchaser prices. Each purchaser has potentially a different price depending upon its status—intermediate consumer or a final consumer—its distance from the factory gate and whether it buys from a retailer or a wholesaler. Our delineation of the purchaser's price, for both intermediate and final users, into the various components is an improvement over the one in the 1993 SNA, which limits itself only to presentation at purchaser's price. In the 1993 SNA, there is no discussion of issues relating to an efficient and cost-effective deflation procedure in the context of input-output tables; thus the 1993 SNA does not discern the efficacy of recommending delineating purchaser's price into its components of basic price, tax margins, trade margins and transport margins. This is a weakness in the 1993 SNA.

## 17. PRIMARY DISTRIBUTION OF INCOME ACCOUNT

The primary distribution of income account "... consists of two consecutive accounts: the generation of income account and the allocation of primary income account" (paragraph 7.1). The generation of income account shows the sectors in which primary incomes originate as distinct from the sectors destined to receive such incomes. The allocation of primary income account focuses on resident institutional units or sectors in their capacity as recipients of primary incomes rather than as producers whose activities generate primary incomes. In the CSNA, the primary distribution of income account is not disaggregated into generation of income account and allocation of primary income account. Generation of income account is problematic for us as we do not have full production accounts for institutional sectors as defined in the 1993 SNA (see item 9 above). Though many items are developed to articulate generation of income account and allocation of

income account, we do not have estimates for all the items and definitely not for the long time series. Note that we have implemented the 1993 SNA beginning at the first quarter of 1961. Our users for time series data require similar presentation for the entire series.

#### 18. SECONDARY DISTRIBUTION OF INCOME ACCOUNT

The 1993 SNA carries forward the balancing item from the primary distribution of income accounts to the secondary distribution of income account. Items in the secondary distribution of income account consist of current transfers such as: (i) current taxes on income, wealth, etc., (ii) social contributions and benefits, or (iii) other current transfers. In the income component of the income and outlay account of the CSNA, primary and secondary distribution of income accounts of the 1993 SNA are merged. This is primarily a presentation issue. However, presentation assumes a particular importance when one publishes a series for all the way back to 1961 at quarterly frequency.

#### 19. USE OF INCOME ACCOUNT

The purpose of the use of income account is to show how households, government units and non-profit institutions serving households allocate their disposable income between final consumption and saving. The use of income account in the 1993 SNA is similar to the outlay part of the income and outlay accounts of the CSNA. This is primarily a presentation issue and the same notes apply here as in the above two items.

#### 20. REINVESTED EARNINGS ON DIRECT FOREIGN INVESTMENT

According to the 1993 SNA, both systems (SNA and Balance of Payments) "... require the saving or retained earnings of a foreign direct investment enterprise to be treated as if they were distributed and remitted to foreign direct investors in proportion to the ownership of the equity of the enterprise and then reinvested by them. In other words, two additional entries are required in the accounts of the enterprises and their foreign owners, one of which is the imputed remittance of retained earnings while the other is the imputed reinvestment of those earnings" (paragraph 7.120).

Starting with the first quarter of 1994, reinvested earnings based on ownership have been incorporated in the Canadian balance of international payments in both the current and the capital and financial accounts, as per the recommendations in both the 1993 SNA and the IMF's Balance of Payments Manual, 5th Edition, 1993.

The recommendation of the 1993 SNA has not been adopted in the rest of the CSNA—the income and expenditure accounts and financial flows accounts, primarily due to statistical difficulties. The amount of detail required to adjust the financial account, across 20 institutional sectors and for almost 40 years on a quarterly basis for the historical period was simply not available without incurring huge costs. Instead, both the balance of payments and the rest of the CSNA

provide separate information on reinvested earnings on direct investment to allow users to alternate from one approach to the other.

## 21. FINAL CONSUMPTION EXPENDITURE AND ACTUAL FINAL CONSUMPTION

The 1993 SNA recommends to articulate final consumption expenditure and actual final consumption for the three sectors (general government, NPISHs and households) in which final consumption takes place (paragraphs 9.93–99). On a practical level, it may be noted that each of the aggregates, whether referring to final consumption expenditure or actual final consumption, has to be derived from data on expenditures. It should be emphasized that actual final consumption for the whole economy is exactly equal to final consumption expenditures.

This recommendation would help international comparability of household consumption. However, we have not yet been able to develop estimates for functional distribution of government expenditures on goods and services for the national accounts. Our main problem is that in the public accounts of the various levels of governments, there is no separate capital account, hence no estimate of capital depreciation. The Canadian situation may not be unique. Hence, this recommendation has not been implemented in the CSNA, but we are interested to see the experience of those countries which do implement this guideline of the 1993 SNA.

## 22. GROSS CAPITAL FORMATION FOR VALUABLES

The 1993 SNA states: “Gross capital formation is measured by the total value of the gross fixed capital formation, changes in inventories and acquisitions less disposals of valuables” (paragraph 10.32). Acquisitions less disposals of valuables is a brand new item in the definition of gross capital formation, for both the CSNA and the 1968 UN SNA. The 1993 SNA further states: “Valuables are assets that are not used primarily for production or consumption, that do not deteriorate over time under normal conditions and that are acquired and held primarily as stores of value . . . . Valuables consist of: (a) precious stones and metals such as diamonds, non-monetary gold, platinum . . . held by any units including enterprises provided that they are not intended to be used as intermediate inputs into processes of production; (b) paintings, sculptures, etc. recognized as works of art and antiques; (c) other valuables, such as jewellery fashioned out of precious stones, metals and collections” (paragraph 10.116).

This is an important additional element in both the capital formation and the capital account. Due to data problems, we have not been able to estimate acquisitions less disposals of valuables as a separate item in the CSNA. Expenditures on valuables such as jewellery by the household sector remain included in the personal expenditures, not in the capital account.

## 23. INVENTORIES OF STRUCTURES

The 1993 SNA states: “When there is no contract of sale agreed in advance, the output produced by the construction enterprise must be recorded as work-in-progress or as additions to the producers’ inventories of finished goods,

depending upon whether the construction is completed. For example, finished dwellings built speculatively remain as additions to producers' inventories of finished goods until they are sold or otherwise acquired by users" (paragraph 10.75).

In the CSNA, all structures, completed or unfinished, with or without contract of sale, are classified as fixed capital formation. However, in the investment in residential structures series, published by the Income and Expenditure Accounts Division, value of new housing construction is disaggregated in three parts as follows: Change in work-in-progress inventory, change in inventory of completed units, and sales of new dwelling excluding land. This additional information is quite useful for analytical purposes.

#### 24. MACHINERY AND EQUIPMENT AND PROGRESS PAYMENTS

The 1993 SNA states: "Gross fixed capital formation is not recorded until the ownership of the fixed assets is transferred to the unit that intends to use them in production. Thus, new machinery and equipment that has not yet been sold forms part of additions to inventories of finished goods held by the producers of the assets. Similarly, imported machinery and equipment is not recorded as gross fixed capital formation until it is acquired by the unit that intends to use it" (paragraph 10.81). When progress payments are made for equipment such as ships, aircraft and rolling stock which take a long time to complete, the ownership, per the 1993 SNA guidelines, is not assumed to be transferred in stages as the payments are made, even if there is a contract of sale that was agreed in advance. Progress payments made under a contract of sale or otherwise are to be recorded as a financial transaction in the financial account, not as fixed capital formation. The same rule applies to progress payments made on imported machinery and equipment.

In the Canadian balance of payments, progress payments made on imported machinery and equipment are treated as a financial transaction, as recommended both in the 1993 SNA and the IMF's Balance of Payments Manual 5th Edition, 1993. The CSNA has made an adjustment to exclude progress payments from capital formation in machinery and equipment when such payments involved transactions between residents and non-residents. Due to data constraints, the 1993 SNA recommendation for other progress payments has not been implemented. Where there is a contractual sale and progress payments, the CSNA has continued to treat work-in-progress for machinery and equipment as capital formation when both parties are domestic enterprises.

#### 25. LIVESTOCK

The 1993 SNA recommends (actually it repeats the recommendation of the 1968 UN SNA) that livestock used in production year after year, such as breeding stock, dairy cattle, sheep reared for wool and draught animals, be treated as fixed assets. On the other hand, animals raised for slaughter, including poultry, are not

fixed assets but are included in inventories (paragraph 10.83). Due to data problems, the CSNA has not adopted this recommendation; instead the value of acquisitions less disposals of livestock during an accounting period is allocated to inventories.

#### 26. PLANTATIONS, ORCHARDS, ETC.

The 1993 SNA recommends (again, it repeats the recommendation of the 1968 UN SNA) that trees cultivated in plantations for the products they yield year after year—such as fruit trees, vines, rubber trees, palm trees, etc.—be treated as fixed assets (paragraph 10.83). The value of such fixed assets may be approximated, if necessary, by the costs incurred in their production during the period (paragraph 10.88). Due to data problems, the CSNA has not adopted this recommendation. Instead, it treats these costs as intermediate consumption.

#### 27. SOFTWARE PRODUCED FOR OWN USE

The 1993 SNA notes: “Computer software that an enterprise expects to use in production for more than one year is treated as an intangible fixed asset. Such software may be purchased on the market or produced for own use. Acquisitions of such software are therefore treated as gross fixed capital formation” (paragraph 10.92).

The Private and Public Investment (PPI) survey at Statistics Canada asks companies to report all expenditures on software along with their purchases of computers and other associated hardware. Any software purchased is included with office machinery in the PPI survey. The PPI survey has tried to get companies to report software expenditures separately from hardware expenditures. However this did not seem to be possible for them. Software expenditures that are most likely to be included are those purchased at the same time as the computer hardware, as well as any other large software expenditures. Contrary to the recommendation of the 1993 SNA, the CSNA, due to data problems, (and Canada may not be unique in this situation) has not been able to capitalize the amount of expenditure made on the development of software, produced for own use.

#### 28. ENTERTAINMENT, LITERARY OR ARTISTIC ORIGINALS

The 1993 SNA recommends treating original creations—such as original films, sound recordings, manuscripts, etc.—as capital formation (paragraph 10.94). Due to data problems, the CSNA has not been able to capitalize the value of such originals. In some cases they are added to inventories, and in others, they are treated as intermediate consumption.

#### 29. ACQUISITIONS LESS DISPOSALS OF NON-PRODUCED NON-FINANCIAL ASSETS

The 1993 SNA recommends that acquisitions less disposals of non-produced non-financial assets be reported in the capital account. These assets consist of

land, sub-soil assets that may be used in the production of goods and services and intangible assets such as patented entities, leases, other transferable contracts, etc. (paragraphs 10.120–130). In the CSNA capital and financial account, transactions in land are included. Due to data problems, the CSNA has not been able to record explicitly expenditures on other non-produced assets in the capital finance account; instead they form part of the balancing item, net lending or borrowing of the sectors.

### 30. NET LENDING OR BORROWING

The CSNA capital and financial accounts by sectors include acquisitions less disposals of land and some identifiable produced capital assets. However, due to data problems, transactions in other existing assets, notably non-produced assets, are not identified; instead, they form part of the balancing item, net lending or borrowing of the sectors. At the level of the total economy, acquisitions less disposals of these assets would cancel out but they could be of significant value for individual institutional sectors. We recognize that this is a weakness in the capital and finance accounts of the CSNA.

### 31. VALUATION ISSUES, NATIONAL BALANCE SHEET ACCOUNTS

The 1993 SNA states: “For the balance sheets to be consistent with the accumulation accounts of the System, a particular item in the balance sheet should be valued as if it were being acquired on the date to which the balance sheet relates, . . . This implies that assets and liabilities (and thus net worth) are to be valued using a set of prices that are current on the date to which the balance sheet relates and that refer to specific assets” (paragraph 13.25). In the CSNA, the following treatment has been implemented:

(a) Produced tangible assets are valued at current prices, using a perpetual inventory method to obtain depreciated replacement cost estimates.

(b) Non-produced tangible assets, such as land surrounding structures and agricultural land, are reported on the basis of current valuations. Other non-produced assets are valued at current prices (typically net present values).

(c) Financial data are reported at book value or at cost. Foreign currency denominated items are revalued for unrealized, or holding, gains and losses. Loans are shown net of allowances (or accumulated provisions less recoveries and write-offs).

(d) Financial assets reflect a mixture of valuations though, generally, these are considered to be at book value, which could be either cost, equity or market value. Liabilities are reported at book or par values. The corporate share liability is equal to shares outstanding plus retained earnings (essentially, equity).

Practical difficulties of revaluing at current prices all financial assets and liabilities of all institutional sectors (there are 31 in the CSNA balance sheet) remain substantial. In the case of bonds, see item 32, we are very reluctant to restate the debt position of their issuers in the event of interest rate changes. Therefore, the CSNA has not been able to fully implement the 1993 SNA recommendations.

### 32. HOLDING GAINS/LOSSES FOR BONDS

With reference to bonds, the 1993 SNA states: "A bond is a security that gives the holder the unconditional right to a fixed money income or contractually determined variable money income over a specified period of time and also the right to a fixed sum as repayment of principal on a specified date or dates . . ." (paragraph 12.109). "The prices of marketable bonds change, however, when the market rates of interest change, the prices varying inversely with the interest rate movements. The impact of a given interest rate change on the price of an individual bond is less, the closer that bond is to maturity. Changes in bond prices that are attributable to changes in market rates of interest constitute price, and not quantum changes. They therefore generate nominal holding gains or losses for both the issuers and the holders of the bonds" (paragraph 12.111). As interest rates decline, the market prices of bonds increase. Should higher values of assets be reported for the holders of these bonds and higher values of liabilities and a higher debt position for the issuers of the bonds when the face value of the debt has not changed? The CSNA was not comfortable changing the value of debt due to a change in interest rates. Thus the CSNA has not implemented this recommendation of the 1993 SNA. See also item 31.

### 33. GOVERNMENT EMPLOYEES DEFINED BENEFIT PENSION PLAN

The 1993 SNA states: "Defined benefit pension plans are those in which the level of pension benefits promised to participating employees is guaranteed. Benefits are related by some formula to participants' length of service and salary and are not totally dependent on the assets in the fund . . . . The liability of a defined benefit pension plan is equal to the present value of the promised benefits" (paragraph 13.78).

The government of Canada and many governments in the other OECD countries have defined benefit pension plans for their employees. In the case of the government of Canada, all employer and employee contributions are deposited in the superannuation fund. An actuarial estimate is generally used to determine the liability of the government to the plan. Actuarial liability of the fund is published and is recognized in the public accounts of Canada as a public debt. However, the government uses these funds to finance its operations and there is no trustee other than the government to administer the operations of this fund.

Following the 1993 SNA, the CSNA had planned to include the liability of the government of Canada pension plan as a liability of the federal government and as an asset of the household sector. The amount is significant, more than 100 billion Canadian dollars, and the issue of public debt is important internationally. Thus we have delayed its implementation until other OECD countries implement the 1993 SNA so that the Canadian public debt position remains comparable with that of other countries.

### 34. SUPPLY AND USE TABLES AND INPUT-OUTPUT

The 1993 SNA includes an integrated set of supply and use tables as well as symmetric input-output tables. In the 1993 SNA symmetric input-output tables,

the number of rows and columns are identical as well as the same classifications or units are used in both rows and columns—such tables are inter-industry or commodity by commodity. The 1993 SNA states: “The System recommends that the statistical supply and use tables should serve as the foundation from which the analytical input–output tables are constructed” (paragraph 15.7).

The CSNA produces the statistical supply and use tables similar to the ones recommended in the 1993 SNA. The dimensions of the Canadian tables are rectangular, meaning that the number of products is larger than the number of industries. The Canadian statistical input–output tables have three broad sectors of the Canadian economy—business sector, government sector, and non-profit institutions serving households (NPISHs) sector. The business sector is coterminous with the aggregation of producing units of three 1993 SNA sectors, namely non-financial corporations sector, financial corporations sector, and the household sector. The business sector is disaggregated by industry based on the Canadian Standard Industrial Classification. The outputs and inputs of the other two sectors—government and NPISHs—are disaggregated not by industry but by broad functions, such as education, health, recreation, administration, etc. The 1993 SNA supply and use tables are disaggregated by industry and there is no automatic link between the sector and their underlying producing units or establishments. The Canadian inputs and outputs of the business sector provides a reasonable way to link sector-based and establishments-based statistics for the whole business sector.

In the CSNA, we do not have commodity by commodity analytical input–output tables, as recommended in the 1993 SNA. Such tables require homogenous production units which by and large do not exist. Hence they must be imputed, with the result that such tables are based on very artificial assumptions. See also item 8 above on homogenous production unit.

In the CSNA, we do not produce supply or output tables at basic prices as recommended in the 1993 SNA, but at modified basic prices. The Canadian modified basic price has the advantage that it is observed (and can be verified) in the transaction records of the producing units. The 1993 SNA basic price requires information which the producing unit does not have; hence it must be imputed for all the users of such a product. Our preference to connect our information with the accounting records of the institutional and producing units brings transparency to our statistical output. See also item 15 on modified basic price valuation.

### 35. CHAIN INDICES

The 1993 SNA states: “The preferred measure of year to year movements of GDP volume is a Fisher volume index; changes over longer periods being obtained by chaining: i.e. by cumulating the year to year movements” (paragraph 16.73). Linking the series using chain indices has the well-known property that the components do not add up to the aggregate. The 1993 SNA states this problem as follows: “In order to preserve the volume movements at each level of aggregation, components have to be linked as well as the aggregates. . . . The problem that emerges with this method is that the constant price values for the components do

not add up to the constant price values of the aggregates after the series have been linked . . . In other words when every series at each level of aggregation is individually linked, the resulting constant price data are not additively consistent after the linking has taken place” (paragraph 16.37).

Constant price GDP and their components are measured in the CSNA using fixed base volume indices. The base year for constant price series changes about once every five years. When the base year is changed, the CSNA, for its macro GDP and its components (in contrast to the details in the input–output tables) series does not recalculate the movements of volume in the previous series using the new base year values but chains them keeping the old growth rates fixed. Thus we have chain volume indices but the chain changes only occasionally. The constant price values of components add up to their aggregates for the current period (beginning from the latest base year), but such components do not add up for the earlier periods.

The problem of additivity assumes a much larger importance in the context of input–output tables, and the 1993 SNA has not provided any operational guidelines. The CSNA produces annual constant price detailed input–output tables which are benchmarks for the monthly real GDP by industry program. When the base year is changed, the previous years’ tables are not chained. Instead, they remain produced in their earlier period’s base year. Thus we have input–output tables for 1992 to 1995 period at 1992 prices, and input–output tables for 1986 to 1992 period at 1986 prices, and so on. We have not been able to devise a system to link input–output matrices using chain indices, given that there would be statistical discrepancy for every aggregate in both commodity and industry space, and the tables must also be shown in a matrix format.

For GDP and its components, chaining the previous period but not changing the chain every year but every five years, or so, was considered a sensible modification in our implementation of the 1993 SNA recommendation of chaining on a yearly basis. As well, the CSNA continues to produce annual and quarterly chain indices for GDP and its components as supplementary information. Most of the CSNA users, particularly model builders, find our presentation of constant price series on GDP and its components quite convenient.

#### CONCLUDING REMARKS

In Canada, we have implemented the 1993 SNA but with some modifications and the resulting statistical series were released in 1997. Our occasional departures from the 1993 SNA are primarily prompted by pragmatic considerations, such as our institutional structure, our statistical sources as well as the availability of resources and their cost-effective use. It needs to be emphasized that most of our departures affect the overall GDP only marginally and are primarily in the sector details. As other countries implement the 1993 SNA, they will, like Canada, also examine, adapt and revise certain guidelines to fit their own circumstances. It would be very useful if these countries would prepare a document similar to this one, comparing their system of national accounts with the 1993 SNA. A collection of such reports will provide very useful and rich source material for possible changes in the future version of the international SNA. If the problems faced by

many countries are similar, then the Inter-Secretariat Working Group on National Accounts may consider issuing some clarifications as soon as possible so that other countries that have not yet implemented the 1993 SNA may benefit.