

NEW DEVELOPMENTS TOWARDS RESOLVING THE COMPANY-ESTABLISHMENT PROBLEM*

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The paper begins by stating various aspects of the national economic accountant's "company-establishment problem." Six possible approaches to the problem are briefly outlined. The paper concentrates on one approach based on new developments in business accounting theory and practice, namely divisional-reporting procedures. The division represents the smallest operating entity capable of reporting both a complete set of production (income) statistics and a set of related financial (balance-sheet) statistics. When companies are owned and controlled by the same interests, namely the enterprise, each division reports on an enterprise-wide basis. In this important case, the traditional company-establishment problem has an enterprise-division-establishment resolution.

There is considerable emphasis on clarifying the issues needed for systematic development of divisional-reporting to meet the requirements of a national statistical agency. Key aspects are the provision of appropriate conceptual distinctions relating to statistical structure of corporate organizations and patterns of intercorporate ownership consolidation. Practical experience gained by the U.S. Federal Trade Commission's line of business reporting program is also highlighted. Two tables show details with respect to a proposed divisional income statement and balance-sheet statement that a systematically developed division-reporting unit can provide. The tables are related to existing statistics yielded by traditional company- and establishment-reporting units. In effect the paper is part of a movement giving national economic accounting more microdata dimensions. Future research must integrate the proposed new statistical reporting unit within systems of national accounts presently constructed on the basis of a dual sectoring classification.

I. INTRODUCTION

The main purpose of this paper is to introduce and analyse some new commercial accounting developments that may prove useful towards resolving the national economic accountant's "company-establishment problem." The approach in the paper is largely conceptual in orientation rather than empirical. We are very much concerned with clarifying the basic issues and pointing towards the possibilities of applied resolution. Though the framework presented is strongly influenced by the author's knowledge of the American and Canadian economic and accounting literature, it is hoped that the basic ideas would have a wide applicability.

The company-establishment (C-E) problem¹ has a long history in the national economic accounting literature. The problem is of key importance in a paper by Sigel (1955) together with comments of Jaszi (1955). Their discussion is concerned with the technical issues of relating establishment-based input-output tables to a company-based flow-of-funds accounting system. This theme and others also turn up in the Report of a Conference on the Proposals for Revision of the

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¹The next section of this paper is specifically concerned with answering the question: What is the company-establishment problem? It should be noted that the problem is also referred to in the literature as the "establishment-firm dichotomy."

United Nations System of National Accounts, as in Tice (1967). Copeland's (1957) classic challenge to Leontief to show how the input-output system could be synthesized with money-flows certainly implies respect for the company-establishment problem. A particularly clear statement of the problem, in a more general setting, appears later in Jaszi (1971): production and related statistics are best reported on the basis of industrially homogeneous units, the individual establishment; financial and related statistics come naturally from the (heterogeneous) legal entity responsible for and controlling their constituent establishments, namely the company. Hence, the perennial problem of trying to impute financial-type statistics to industrially homogeneous classifications. More recently the C-E problem is the center of attention in the debate between Ruggles and Ruggles (1982a, 1982b) and a number of commentators concerning a proposed Integrated Economic Accounts for the United States. It should also be noted that the dichotomy between establishment-reporting units and company-reporting units is discussed in the standard United Nations (1968) and (1971) publications.

In the course of preparing this paper, it soon became apparent that a definitive account and resolution of the C-E problem really requires a major inter-disciplinary effort. The expertise of a team of economists, statisticians, corporate accountants, computer programmers and, perhaps, legal experts are called for together with the full support and documentation of a national statistical collecting agency. Since no such effort is presently apparent, at least to this writer's knowledge,² it may still be worthwhile to make some attempt in the required direction provided that limitations are recognized. This paper, then, could be regarded as offering guidelines, sometimes quite specific guidelines, along which a more complete study could proceed. In any event we hope, as a minimum, to show that a definitive exposition and analysis of the C-E problem is long overdue. One other point should also be stated. The main contribution of this paper is to introduce a new (or, perhaps, not-so-new) type of statistical reporting unit that, it is argued, could play a key role towards resolving the traditional C-E dilemmas. The new reporting unit is analysed particularly in the context of other suggested measures for handling, or approaching, the C-E problem. We do not, however, in this paper spell out the precise implications of the new reporting unit for a nation's economic accounting system. If the new type of statistical unit is found to be reasonable and feasible, then there certainly would be implications for national economic accounts. But the precise implications would really depend on the peculiarities of each nation's industrial organization, corporate accounting disclosure practices, and statistical collecting system. We do, however, consider the new statistical reporting unit in an industrial context much wider than the manufacturing sector to which most traditional discussion of the C-E problem has been restricted.

II. WHAT IS THE COMPANY-ESTABLISHMENT PROBLEM?

In order to focus on the essential nature of the problem, it is convenient to begin by restricting attention to the incorporated business sector of the national

²Some statistical agencies may well have examined the C-E problem in depth, but there is no publicly available documentation in any depth.

economy. We will also at this initial stage neglect the important distinction between the corporation (or company) and the enterprise (group of closely affiliated companies). Each business establishment, as described below, is owned and operated by one company³ and different companies are initially assumed to be independent. The company is easy to define as the statistical unit representing the legal entity which enters into contracts and which ultimately receives and disposes of all sources and uses of income and financial funds. The company, therefore, maintains complete profit-and-loss and balance-sheet accounts together with other related accounting records. But what precisely constitutes an establishment? The standard United Nations (1968, p. 232) definition is:

In concept, the combination of activities and resources directed by a single owning or controlling entity towards the production of the most homogeneous collection of goods and services, . . . , for which separate data can be compiled in respect of the production and all the intermediate inputs, labour and capital resources employed for this purpose, directly and in support of, or ancillary to, the production.

At first glance this definition would seem to imply that the establishment, as a statistical unit, should be capable of recording a complete production account statement (the language of business accounting is used, for the most part, throughout the paper). In practice we know that the implication necessarily holds only in the case of the single-establishment company, i.e. when the two statistical units coincide. In this special case there is really no C-E problem other than the possibility of industrial misclassification error due to incomplete or inconsistent business industrial registration records. We, again, assume that single-establishment companies are consistently recorded in both establishment and company business registration files.

II.1. *Aspects of the Company-Establishment Problem*

The C-E problem can arise, however, in the case of multi-establishment companies. Indeed, the existence of the multi-establishment firm is a necessary, but not sufficient, condition for the C-E problem to arise. First it should be noted that the United Nations definition of "establishment" is broad enough to encompass both "kind-of-activity units" and the traditional manufacturing establishment-type units. Therefore our discussion is applicable to economic activities such as construction, transportation, communications, forestry, fishing, utilities (electricity and gas) and, possibly, agriculture as well as manufacturing, mining and distribution.⁴ Second, it is even possible to interpret (or extend) the United Nations definition so as to include "ancillary units" as a special type of establishment (namely, pseudo-establishments). In any event, it is well-known that ancillary units, especially head offices, raise difficult allocation problems and these have already been discussed elsewhere (see e.g. Postner (1982, pp. 221–222)). Third, and most important, there is an implicit assumption embodied in the establishment definition that deserves to be spelled out: the establishment is essentially character-

³Complications arising from joint ventures are discussed in section V.

⁴Some special problems relating to finance, insurance and real estate are mentioned in sections IV and V.

ized by the availability of homogeneous production accounting records and for practical purposes the specification of required accounting records is kept deliberately vague and flexible. Often, to qualify as an establishment, all that is needed are data relating to sales or production, cost of materials used and labour employed. In particular, the establishment components of the multi-establishment company are not required to each possess a complete production account statement. The company's production account statement (closely related to the company's income statement) is, therefore, not a simple consolidation of the constituent establishments' production account statements since these latter statements typically do not exist in a complete form. Conversely, one cannot obtain establishments' production statements as a deconsolidation of the company's production (or income) statement without deploying a series of arbitrary allocations. All this is one aspect of the company-establishment problem.

To be clear, it is true that more production and closely related detail can be surveyed at the establishment-reporting level than on a company-reporting basis. Indeed this presupposition is the very foundation of the establishment concept along with the homogeneity postulate. For example, the establishment accounting records will contain inter-establishment (intracompany) sales and receipts which are usually consolidated out in the company-level production or operating statement. But a more adequate coverage of establishment production and cost records, from one viewpoint, does not necessarily imply complete coverage from another viewpoint. We know there are a whole range of increasingly important intermediate service costs and expenses that are typically not accounted for by establishment reporting. At best, establishment data can provide "census value-added" and not "pure value-added."⁵ Similarly, the establishment-reporting basis alone usually offers no breakdown of gross operating surplus;⁶ there is no distinction between capital consumption and depletion allowances, net interest payments, net rental (non-intermediate) expenses, various accounting and reconciliation adjustments, and the residual (presumably, net operating profit). These items and others will be distinguished in the consolidated company-reporting income and production statements. In fact, it can be argued that certain interest and rental payments are best regarded as intermediate business service expenses and so are an essential feature for a complete accounting of establishment production. This, therefore, is another aspect of our problem.

So far we have not explicitly discussed the main aspect of the company-establishment problem. Since the following aspect is rather well known, the discussion is brief. The company-reporting unit is a legal ownership entity and thus preserves a complete sources-and-uses of funds statement together with balance-sheet accounts. The establishment-reporting unit is a homogeneous production entity for which financial transactions and balance-sheet accounts are not distinctly recorded. This essentially means that the homogeneous production characteristic of establishment reporting cannot be directly related to commonly used financial ratios such as return to investment, earnings per share, net income as a percentage of stockholders' equity, and James Tobin's "q" ratio. The reader

⁵This is discussed at length in Postner (1982, pp. 219–221).

⁶Gross operating surplus equals value-added minus total wages and salary expenses and provisions.

may object that this limitation only holds for multi-establishment corporations that are industrially diversified. This point requires some clarification. Any multi-establishment company may be subject to regional diversification in addition to the possibility of industrial diversification. In this case, then, financial ratios are not available on a regional or geographic basis. But most important, any multi-establishment (or even single-establishment) company over a certain minimum size does become “industrially” diversified in a particular sense: the corporation is typically and significantly involved in purely financial transactions, extraordinary/unusual items and, perhaps, accounting adjustments that cannot meaningfully be related to establishment production activities even under ideal circumstances.⁷ It is in this extended sense that we may claim that the company-establishment problem cannot be entirely avoided. In any event, there is also abundant evidence that the economies of industrial nations are mainly dominated by large multi-industry companies (and enterprises) in which the term “industrial diversification” is formally restricted to its more conventional meaning (see the evidence in Postner (1982, pp. 226–228)).

II.2. *Approaches to The Company-Establishment Problem*

This subsection briefly outlines some approaches to the C-E problem found in the national economic accounting literature. These approaches themselves aid in understanding the nature of the problem. It should be noted that the literature does not contain any formal “resolution” of the problem. The various approaches are numbered for convenience as references.

ONE: The United Nations System of National Accounts (SNA) provides one way of dealing with the C-E problem. The system contains a dual sectoring in which production and capital formation accounts are defined using statistical units based on establishment-reporting and, therefore, subject to an activity or industrial classification. On the other hand, income and outlay, capital finance and balance-sheet accounts require an institutional (ownership) classification based on the legal entity, namely company (or enterprise)-reported data. But how are the two classification sectors linked? To quote directly from United Nations (1968, p. 26):

In the case of enterprises, since the capital formation accounts are classified by industry whereas the capital finance accounts are classified by institutional sector, all capital formation is debited to a dummy account... which is provided with finance by the capital finance accounts. This device avoids an industry \times sector interaction in the capital accounts and corresponds to the similar device used in the current accounts to reallocate compensation of employees and operating surplus from activities to institutional sectors.

In other words a dummy transformation methodology is used to bypass cross-tabulations and avoid the microdata problem of industrial production diversification of institutionally classified companies and enterprises. This means that there is neither explicit financial information for establishment-based industries nor

⁷More specific examples are given later in this paper; see reference to what is known as the “general corporate division.”

production and related information for ownership-type classifications. The dual sectoring is only reconciled at the consolidated national level.

TWO: The U.S. Department of Commerce (1973) project on enterprise statistics is directly relevant to the C-E problem. The work is based on a micro-linking of Census establishment production data and Internal Revenue Service corporation income tax financial statistics. The link between the two types of reporting units is effected by a microdata panel: each establishment is implicitly or explicitly matched to a corporation identification code.⁸ The microdata are aggregated and published using industrial tabulations based on an enterprise industrial classification system. It is then possible to impute certain financial-type statistics to industrial production data by using simple proportionality “rules” or assumptions (see U.S. Department of Commerce (1973, p. 82, last paragraph)). In fact a procedure somewhat along these lines, in another context, is recommended in Postner (1982, pp. 229–230). This example of an approach to the C-E problem does have the advantage of facing the microeconomic nature of the problem. But simple proportionality “rules” are essentially arbitrary whether the basic microdata are preserved or aggregated.

THREE: It is possible to argue that establishment-type units must be limited to production-related activities since these units lack financial independence. In the words of the latest United Nations (1982, p. 37) review:

It may not be possible to separate their assets and liabilities from those of other establishments of the same parent enterprise. It therefore may not be possible to construct a complete set of accounts for establishments classified by . . . activity. No such limitation applies to enterprises classified by institutional sector . . . A complete set of accounts . . . is both conceptually valid and statistically feasible.

One potential application of this argument is the construction of input-output tables based on company-reporting units. This, presumably, would permit the relation of a flow-of-funds accounting system to input-output statistics. But precisely how would such an input-output table be constructed? This question is not answered in the literature, but it is easy to imagine the required method. We would need two transaction tables: (1) a matrix showing company-based industry⁹ intermediate purchases from establishment-based industries, and (2) a matrix showing company-based industry production of establishment-based industrial products. Indeed the two matrices are the respective analogues of the input (use) matrix and the output (make) matrix of conventional input-output tables where the usual distinction is drawn between industries and commodities. Then a company-based industrial input-output table can be formed by combining and manipulating the two component matrices. It is interesting to observe that the two specified required matrices represent “industry × sector interactions” (cross-tabulations) which the original United Nations SNA tries so hard to avoid. In any event, this third approach to the C-E problem raises the basic question

⁸This is a simplification of the procedures actually used.

⁹The company is classified to the single industry where the company has more operations compared to any other single industry.

as to whether the simple company-establishment dichotomy characterization is telling the whole story.

FOUR: Empirical microdata studies of establishment-based production statistics and their matched company-based financial statistics are certainly relevant to the problem of this paper. One such study is reported by Ruggles and Ruggles (1982b, p. 43):

... it is both feasible and desirable to build comprehensive microdata sets by using exact matching ... a longitudinal microdata file for firms and establishments has been developed for the manufacturing sector for the period 1972–80.

The complete results of this study are not yet available. It would be interesting to see how problems relating to establishment-based production data are handled. Empirical studies of this nature would be equally revealing for industries other than manufacturing. Most important, perhaps, the study might serve as a model for investigating the economic implications of statistical reporting units that are not limited to establishments and companies.

FIVE: Another approach to the C-E problem regards the company-reporting unit as an intermediate link between the establishment and the enterprise. It is implicitly assumed that the individual company's production is reasonably homogeneous and that the financial reports of legal entities within the enterprise are unconsolidated. This approach raises a series of issues that have been deliberately neglected in this section and that will be discussed and analysed in section V. At this point we would say the approach is not to be recommended.

SIX: The final approach is one that has been only mentioned, and not pursued, in the national economic accounting literature. The Report of Tice (1967, p. 65) states:

It was suggested that the UN give some consideration to the possibility of developing some linkages between companies and establishments ... through the use of some intermediate reporting unit such as the division ...

A similar suggestion is also made later in the Tice Report (1967, p. 88). This idea of an intermediate reporting unit, combining both financial data and a reasonable degree of product homogeneity, has so far remained essentially dormant in national economic accounting circles even though a very similar idea is active in commercial accounting theory and practice. Divisional reporting and segmented reporting will be outlined in the next section and then explicitly analysed in section IV in the context of our C-E problem.

II.3. *Is The Establishment Concept Obsolete?*¹⁰

Earlier it was mentioned that the establishment concept is best interpreted and applied in a flexible manner. It is this writer's impression, however, that it is becoming increasingly difficult to apply the establishment concept even with

¹⁰This subsection has benefited from a reading of Kaplan (1982, Chapter 13).

appropriate flexibility. The fact is that none of the organizational units that typify most large North American corporations appear to meet the requirements of the traditional establishment. The establishment concept would seem to be, at least partly, out-of-touch with the world of management accounting and so represents an element of artificiality and a respondent burden. What, then, are the natural organizational units of the large multiproduct corporation featuring some degree of decentralized decision-making? Since the answer to this question can be obtained from any modern management accounting text, our discussion will be very brief.

Production or service departments producing well-measured and homogeneous outputs are managed as “standard cost centers.” These units are responsible for satisfying externally given demands (i.e. volume, commodity-mix and output price are external) subject to a cost-minimizing efficiency standard. Thus cost of materials used and labour employed are controlled, but production sales revenue may not even be known¹¹ by the standard cost center. Marketing departments are organized as “revenue centers” with the goal of attaining certain sales targets or market shares. These departmental units may set prices and choose product-mix, but are not directly concerned with cost of materials or labour employed in production. When output is difficult to measure and not necessarily related to inputs, then the organizational unit becomes a “discretionary expense center” (e.g. general and administrative service departments, research and development units). The discretionary expense center is reminiscent of the national economic accountant’s ancillary unit. The center or unit typically serves other (internal) units of the corporation. If the management of an operating unit is given responsibility both for obtaining required inputs and for choosing and selling well-measured outputs, then this particular organization is called a “profit center.” Thus a profit center combines the tasks of the standard cost center and revenue center, essentially satisfying the data requirements of the national accountant’s “establishment.” But the range of product-mix is likely to be wide since many different cost centers and at least some revenue centers make up a profit center. There is one other, even wider, unit featured in management accounting theory and practice—the “investment center” (further discussed in the next two sections). Thus the two organizational units of major interest, profit centers and investment centers, will typically violate the establishment’s production homogeneity postulate while none of the other listed units may satisfy the establishment’s basic data requirements.

III. DEVELOPMENTS IN DIVISIONAL AND SEGMENTED FINANCIAL REPORTING

This section provides background material for a proposed statistical reporting unit described in the next section. The present treatment of various existing financial reporting schemes is concise and oriented to our C-E problem. The particular context assumed here is the large multi-establishment multi-industry corporation whose industrial origins, strategy and structure are so well described in the work of Williamson (1981).

¹¹This phenomenon was discussed in Postner (1982, pp. 224–225) in another context.

III.1. *Divisional (Internal) Financial Reporting*

Divisional reporting, as an intermediate link between establishments and the company,¹² is one of the suggested approaches to the C-E problem (see approach “number six” in section II.2). But what precisely constitutes divisional reporting and its motivation? Large diversified corporations are motivated to break down their operations into units of manageable size. Some of these units were mentioned in the preceding subsection. The existence of such units creates a need on the part of corporate management to know and appraise the performance of the units. The divisional form of corporate organization and control has become increasingly popular and dominant in recent years.¹³ For our purposes, a corporate “division” will refer to a business unit which combines the scope of the “profit center” (described earlier) with at least some responsibility for the unit’s working capital and physical asset base. Thus a division is synonymous with the “investment center” in which production-related profitability is measured *vis-à-vis* the physical and financial assets (uses of funds) deployed to generate the profit. Note that divisions are set up for purely internal management control purposes. The number of effective divisions, their coverage (whether industrial or regional or both) and the “generally accepted accounting principles” used to measure the key elements of an investment center are all internal management decisions. These measures may or may not coincide, at the consolidated level, with external financial reporting of overall corporate performance. Divisional reports are not normally available for public consumption nor are they subject to collection by a national statistical agency. There are, nevertheless, some items of interest to be learned from divisional performance measurement and reporting.¹⁴

A divisional unit is conceptually capable of reporting all the production-related information of an establishment and, indeed, the unit is normally composed of a number of establishments together with closely-related ancillary operations. Divisional reports *per se*, though, do not usually contain industrially-specified production (or sales) data and the various costs of materials used and labour employed are not detailed, but rather summarized. On the other hand, the (summary) production statement tends to be complete in the sense that intermediate service input expenses are accounted for (these are mostly corporate and divisional overhead and indirect expenses charged to individual divisions). There certainly are common cost allocation problems to be resolved in divisional reporting, but these problems are handled internally by corporate management accountants in a position of full information. In addition, the division’s gross operating surplus, or its counterpart, may be further refined by explicitly deducting depreciation on controllable fixed assets, imputed interest on investment, and nonoperating losses. Most important, the investment base is specified: total physical and financial assets properly attributable to the division minus accounts payable related to the division. Thus the investment base is defined on a “use” rather than a “source” foundation (with the exception of the liabilities of accounts

¹²We will again, for the most part, abstract from considerations relating to the enterprise as compared to the company (see section V).

¹³See for example Reece and Cool (1978).

¹⁴The following paragraph benefits from the definitive analysis of divisional reporting by Solomons (1968).

payable). It is further suggested that physical assets be valued on a replacement cost basis. Accounts receivable and payable present no special problems of valuation. Finally, there is also a role for a residual “general corporate division” in divisional reporting and this will be discussed in section IV.

III.2. *Segmented (External) Financial Reporting*

Business segmented financial disclosure can be regarded as a natural and relatively recent extension of divisional reporting. We know that divisional reports are purely internal and arranged, both in coverage and substance, according to the discretion of corporate management. There is, then, a wide variety of divisional-type reporting though some important common features are also apparent. It is in this light that accounting regulations concerning segmented external financial reporting have been developed, at least in the U.S.A. and Canada. The general idea is to make divisional reporting more systematic, both with respect to industrial coverage and accounting principles, and the segmented reports must be made publicly available with the corporations’ annual (consolidated) financial statements. Segmented disclosure is directed to the normal users of corporate annual financial reports (such as stockholders and financial analysts) but, as we shall see, is not sufficiently rigorous for the purposes of a national statistical agency.

A business industry segment, as defined by the Financial Accounting Standards Board (1976), is:¹⁵

A component of an enterprise (or corporation) engaged in providing a product or service or a group of related products and services primarily to unaffiliated customers . . . for a profit . . . A reportable segment is . . . an industry segment for which information is required . . .

The disclosure requirements then prescribe a set of reportable segments which all corporations with publicly traded debt or equity securities are expected to follow. The precise segment selection method depends on corporate management judgement, but use of the U.S. Enterprise Standard Industrial Classification Manual is suggested for guidance. Each reportable industry segment should represent at least 10 percent of combined corporate revenue (or at least 10 percent of combined profit, etc.) in such a way that all reportable segments constitute at least 75 percent of combined revenues, with a maximum of ten required segments. The information to be disclosed for each segment shows that FASB, and other similar standards, believes that reportable segments should approximate a corporation’s existing profit centers, when possible. If existing profit centers cross industry lines, or do not exist within a multi-industry corporation, then disaggregation along industry lines is called for. The revenue and income items reportable for each segment are rather analogous to those mentioned in the preceding subsection with respect to divisional reporting. There is, however, more emphasis

¹⁵The Financial Accounting Standards Board (FASB) has a relatively clear set of segment disclosure requirements that mostly coincide with those of the Securities and Exchange Commission (SEC). The Canadian Institute of Chartered Accountants’ (CICA) segmented information requirements are essentially similar. See Lurie (1979) and Miller and Scott (1980).

on reconciliation with consolidated (external) financial reports. On the other hand there is less emphasis on identifying physical and financial assets associated with individual reportable segments. Nor is there any direct way, according to present reporting standards, to adjust physical asset valuation and depreciation to reflect current replacement cost since the basic required information is not mandatory.

III.3. *Federal Trade Commission Line of Business Reporting Program*¹⁶

It is not difficult to see that a segmented financial reporting scheme, as standardized by FASB or CICA, leaves a good deal to be desired. The main objection is that the segment selection criterion is open to corporate managerial manipulation and that there is typically no possibility for inter-corporate comparability of individual segment information. To give just one example: General Motors Corporation recognizes only three reportable segments—automotive products, nonautomotive products, and defense and space products—even though it is known that GM operates in some eighteen different 3-digit industrial activities (see Scherer (1979)). There are further problems relating to segmented reporting: (1) no distinction between gross margin, contribution margin and operating income, (2) payrolls, cost of materials used and important intermediate service expenses (advertising, research and development) are not specified, and (3) common cost allocation and transfer price valuation methods are not spelled out. In addition, information regarding segmented physical and financial assets are inadequate for analytical purposes. All this, and more, provides the background and rationale for the FTC line of business (LB) program which will now be briefly described. A more complete account of the program is implicit in the statistical policy recommendations later in this paper.

According to the FTC program, each LB is a consolidation of all basic company components that have the same primary industrial activity. These basic components roughly coincide with establishments, but may also have a wider or even narrower scope. The primary activities follow an FTC industry category list which is somewhere between the 3-digit and 4-digit SIC. Each company to which the FTC program applies is expected to furnish a relatively long list of information concerning each LB where the company has significant operations. In the FTC program for the years 1974–77, directives were made to about 440 of the largest U.S. manufacturing corporations. Thus the program is essentially directed to reveal the manifold multi-industry activities of these corporations which are hidden in consolidated company financial reports. The FTC specifies about 260 different industry categories in manufacturing and these result in about 3,400 lines of business over the directed population of companies. This means, on the average, that there are slightly less than 8 reported LB per company. (Some corporations report as many as 30 different LB.) The FTC program, then, is very much oriented to identifying industrially homogeneous LB, so permitting reason-

¹⁶Special thanks are due to William F. Long, Manager of the Federal Trade Commission (FTC) line of business program, for making available to the present writer a wealth of material and documentation concerning the program. This writer alone is responsible for the views expressed here. For further details see Federal Trade Commission (1981 and 1982) and also Federal Trade Commission (1982a).

able inter-corporate comparisons. The list of information required for each company's various LB is reminiscent of the suggested standards for divisional reporting mentioned earlier (with some exceptions to come) and, at the same time, avoids the major limitations of segmented financial reporting. There are, nevertheless, some weaknesses to the FTC approach, at least with respect to the concerns of this paper.¹⁷

The financial assets ("uses" of funds) associated with individual LB are not spelled out and neither does there appear to be any consideration of identifiable financial liabilities (e.g. accounts payable). No attempt is made to trace nonoperating gains and losses to reported LB and all (net) interest expenses remain unallocated. The same is true for the cumulated effect of accounting changes. Also, there does not seem to be explicit scope for a residual "general corporate division" in the FTC approach. Most important, perhaps, the FTC is out of touch with the basic establishment production data and company financial data that the manufacturing corporations are required to report to other government statistical agencies.¹⁸ There is, then, an overlapping respondent burden and lack of opportunity to perform essential cross-accounting checks at the microdata level.

IV. TOWARDS A RESOLUTION OF THE COMPANY-ESTABLISHMENT PROBLEM

The material presented so far in this paper can be regarded as providing background for this key section. We have, in national economic accounts, two distinct types of statistical reporting units: (1) the establishment, yielding industrially homogeneous production and related data, and (2) the company, yielding financial and related data on a consolidated basis for the unit's total constituent establishments. (The company can also yield industrially heterogeneous production data on a summary and consolidated basis.) In practice, we construct input-output tables reflecting aggregation and allocation of establishment-based and other data; we also construct flow-of-funds tables and sectoral balance sheets, reflecting aggregation and manipulation of company-based and other data. This writer sees no possibility of "somehow" linking and relating the two sets of aggregated tables¹⁹ unless the basic establishment and company data can be linked and related at the microdata level. Since company financial and related data cannot be simply assigned to establishments without making wholesale arbitrary allocations, nor is it meaningful to pretend that establishments possess individual financial statements, then some "compromise" appears necessary. The compromise should be directed towards proposing a new statistical reporting unit that features both: (1) a reasonable degree of production-related industrial homogeneity within a complete production account statement, and (2) a reasonable set of financial data to which the production statement can correspond. The new statistical unit, then, serves as an intermediate link between the establishments and the company (made more specific in the next subsections). This approach to the C-E problem is definitely microdata-oriented and, indeed, leads to some microdata matching problems in this context.

¹⁷The following may not be "weaknesses" from the viewpoint of FTC deliberations.

¹⁸Such as the Bureau of Census and the Internal Revenue Service.

¹⁹Apart from identity relations at the national level.

Throughout this section we will, for the most part, retain the simple C-E dichotomy (i.e. neglect complications arising from the existence of closely-affiliated companies) and assume that the company is a multi-establishment multi-industry entity. The single-establishment company will later follow as a special case. Once again, the analysis is conceptual rather than empirical.

IV.1. *Statistical Structure of Corporate Organization*

Initially one way to proceed is to define the new statistical reporting unit in terms that parallel the function of the reporting unit used for “principal production statistics,” namely the establishment. What could be more natural than to require the new unit to represent the smallest²⁰ operating entity for which a reasonably complete set of “principal financial statistics” can be obtained? The new units should, again, be mutually exclusive and exhaustive with respect to their universe. Though this approach is attractive, some qualifications are necessary. First we must be sure that the new unit also possesses a complete production account statement. Second, we must specify what is meant by “principal financial statistics” and be sure that these statistics directly (or indirectly, through reasonable allocation procedures) relate to the production statement. Third, and most important, is the question of surveying in advance what can be expected from a nation’s corporations’ accounting systems. In particular, do the major corporations possess sufficiently decentralized and standardized (internal) financial accounting systems so that the new reporting unit would yield information on a basis that is industrially homogeneous and comparable between corporations? Before concluding that the answer to this question is negative, it should be noted that the establishment reporting unit is also subject to a series of similar qualifications. Indeed, it is well known that the construction of input-output tables requires manifold procedures that lead to “raising new establishments” or “carving up old establishments” for the purposes of economic measurement.²¹ In any event, there is no doubt that the new reporting unit for financial statistics should build upon what is already available through divisional (internal) reporting and segmented (external) reporting as outlined in the preceding section. To this end we must recognize the statistical structure of corporate organization—providing guidelines for the new statistical reporting unit.

Diagrams 1 and 2 present two examples of the statistical structure of corporate organization. These diagrams should not be confused with a corporate organization chart, though there are some elements in common. The basic components of each diagram represent statistical organization units that can be combined, as indicated in the notes to the diagrams, to form actual and potential statistical reporting units. Indeed the basic statistical organization units are the ones already introduced in the preceding section II.3. Corporate statistical structure is arranged according to a normal (graph-theoretic) hierarchy with all flow relations of accounting responsibility running from top to bottom. Each statistical organization unit, then, signifies the availability of appropriate accounting records and distinct units do not necessarily imply distinct locations. For example, *R* and its

²⁰“Smallest” in terms of industrial homogeneity of the production set of goods or services.

²¹See the discussion in Postner (1982, pp. 232–234) and also Ritz (1980).

TWO ANATOMIES OF CORPORATE STATISTICAL STRUCTURE

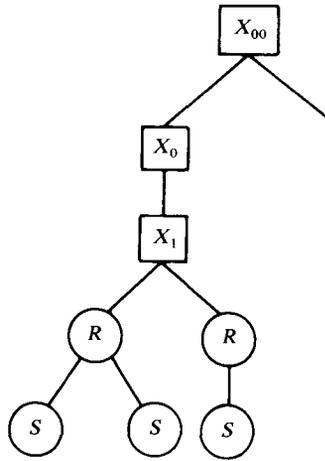


Diagram 1

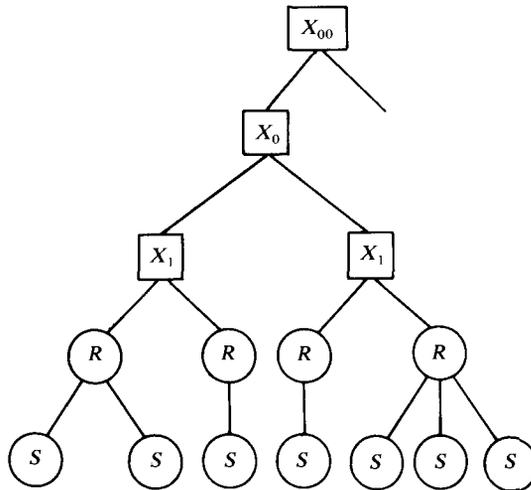


Diagram 2

Notes:

- S represents standard cost center
- R represents revenue center
- X_1 represents (non-financial) discretionary expense centers
- X_0 represents investment base management center
- X_{00} represents the "general corporate division"
- E (establishment) is the smallest complete R - S configuration
- P (profit center) is the smallest complete X_1 - R - S configuration
- D (division or investment center) is the smallest complete X_0 - X_1 - R - S configuration

Diagram 1 displays 2 establishments, 1 profit center and 1 division.

Diagram 2 displays 4 establishments, 2 profit centers and 1 division.

subsequent set of S may all be at the same location; X_1 and its preceding X_0 may be combined and both may be located at corporate headquarters with X_{00} (discussed later), but distinct X_1 and X_0 accounting records must be available with respect to their succeeding sets of R and S . Note that both E , the establishment, and P , the profit center, satisfy certain minimum homogeneity coverage properties. So does D , the division or investment center, of which we will have much more to say shortly.²² The two diagrams represent only two of many possible statistical structures. The two diagrams, though, do cover most important cases or can be made to converge to a number of special cases (see Appendix in original version of this paper available from the author on request).

Before continuing, we say a few words about the discretionary expense centers X_1 and the investment base management center X_0 . X_1 embodies discretionary expenses usually described as ancillary or auxiliary units in the national economic accounting literature. Some of these expenses may also be found in corporate, as well as divisional, headquarters so long as accounting records are available for association with the subsequent set of R and S . Thus X_1 contains research and development expenditures as well as a wide range of general and administrative service expenses. The investment base management center, X_0 , represents the availability of the "principle financial statistics" accounting records which are the distinguishing feature of our proposed "new" statistical reporting unit. It is now clear that the new type of reporting unit coincides with the "division" or "investment center." For short, we will use the simple term division, but our usage of this term does not necessarily coincide in all respects with the "division" of internal financial reporting outlined in section III.1. The essential production and financial statistical requirements that our proposed division must satisfy are fully explained in the next subsection of this paper.

Diagram 2 in contrast with Diagram 1 illustrates a possibly common problem that may arise when utilizing a division statistical reporting unit. The particular division displayed in Diagram 2 encompasses 4 establishments and 7 distinct standard cost centers. Though the division may technically satisfy the statistical requirements of the new reporting unit, on inspection it may be found that the range of production activities is inappropriately heterogeneous. For example, other corporations may typically embody only part of the displayed production range in any one of their divisions. This type of situation is characteristic of the "voluntary" nature of traditional division reporting and segmented reporting discussed earlier. Indeed, this is the precise situation that motivated rigorous line of business reporting at FTC and which a national statistical agency must resolve in formulating the design of a new reporting unit. Such design problems turn up when profiling the statistical reporting unit. One possible approach, then, is to investigate the feasibility of allocating the X_0 financial accounting records of Diagram 2 so as to yield two distinct divisions in a way that follows naturally from the particular corporate statistical structure. Such allocations are "triggered" by the industrial classification category list and homogeneity ratio standards that the new reporting unit is expected to follow.

²²The term "division" should always be understood as meaning "operating division" unless otherwise stated.

IV.2. *What Can The New Statistical Unit Report?*

A statistical unit set up by a national statistical agency is characterized by the information it is required to provide. The unit should bear a close relation to the accounting records already available for the internal control purposes of the corporation or for certain external disclosure practices. The statistical unit, though, need not be identical to available accounting records and so it is common to introduce standardized adjustments or allocations when necessary. Here we show two tables containing a “shopping list” of statistical information expected from the division-type of reporting unit. The list is sufficiently general to cover manufacturing corporations, non-manufacturing non-financial corporations, and financial corporations. It is important that the shopping list retain a potential for matching divisional microdata with establishment and company microdata (further discussed in section IV.4). There is one major limitation of our tables: it is assumed, for convenience, that the change in the physical volume of inventories valued at market prices is zero. This assumption permits us to focus on essentials²³ and implies that the production statement of a division is equivalent to its income statement. To avoid possible misunderstanding, we will from now on use the term income statement, or profit-and-loss statement, instead of production statement.

Table I exhibits a proposed (operating) divisional income statement that the new statistical reporting unit might follow. The statement is in abbreviated form, so a number of explanations are in order. Operating revenues are net, after taking into account discounts, rebates and other allowances. When the division is operating in financial or real estate markets, then operating revenues include interest received and property rentals earned (property could include intellectual property as well as physical property). Revenues from commodity transfers within the division (i.e. inter-establishment intra-divisional transfers) are best shown unconsolidated in order to permit matching with establishment-based data. Problems relating to valuation of intra-corporate transfers are mentioned in the next subsection. All operating revenues, particularly those from sales to unaffiliated customers, should be disaggregated according to the industry category classification list that supports the divisional reporting unit. This would permit checks on secondary product contamination and the need for classification refinements. General and administrative (G & A) service expenses typically embody a long list of intermediate and overhead commodities and primary factor services normally found in the division’s related discretionary expense centers. These expenses also include research and development (R & D) expenditures that we presently treat as a current expense.²⁴ The commodity content of all these divisional service expenses should be itemized—a useful addition to resolving problems of input-output compilation. Note that the distinction in Table I between G & A services directly based on accounting records and G & A services based on indirect corporate allocations is motivated by the need on certain occasions to “raise” new profit centers and new investment centers for the purposes of

²³The inventory change problem is of little consequence for a wide range of service and financial industries.

²⁴The problem of assigning corporate R & D to individual divisions is discussed in Postner (1983).

TABLE I
A PROPOSED DIVISIONAL INCOME STATEMENT (ABBREVIATED FORM)

	\$	\$
Net operating revenues from sales to outside customers	x x x	
Transfers to other divisions	x x x	
Transfers within division (unconsolidated)	x x x	
	<hr/>	x x x
<i>Less:</i>		
Payrolls and related expenses	x x x	
Direct costs of commodities sold or transferred	x x x	
	<hr/>	x x x
Gross margin		x x x
<i>Less (based on accounting records):</i>		
General and administrative service expenses	x x x	
Investment base management expenses	x x x	
	<hr/>	x x x
Contribution margin		x x x
<i>Less (based on indirect corporate allocations):</i>		
General and administrative service expenses	x x x	
Investment base management expenses	x x x	
	<hr/>	x x x
Operating income		x x x
<i>Less:</i>		
Indirect taxes less subsidies received	x x x	
Depreciation and depletion allowances	x x x	
Interest expenses charged to division	x x x	
Rental payments	x x x	
	<hr/>	x x x
Net operating income		x x x
<i>Add (deduct):</i>		
Nonoperating gains and losses allocable to division	x x x	
	<hr/>	x x x
Net income of division (before direct taxes)		x x x

industrial homogeneity and inter-corporate divisional comparability. This means that “contribution margin” is merely a stepping-stone to “operating income.” The remaining categories of the proposed divisional income statement will be clarified shortly together with the proposed financial statement. It is, though, worthwhile to note that divisions can be allocated certain gains or losses that fall outside the division’s ordinary operations. Some examples would be: disposals of fixed assets, gains and losses on foreign exchange transactions, royalty income

and rentals from the division's own tangible and intangible assets, and, possibly, accounting revaluation adjustments allocable to individual divisions.

At this stage it is important to distinguish the divisional income statement from the corresponding statements of the constituent establishments and from the consolidated income statement of the parent company. The typical establishment income (or production) statement would probably end with "gross margin;" G & A expense records are not usually available and allocations tend to be quite arbitrary. Indeed, establishment-based data may not even provide reliable information on net operating revenues. On the other hand, establishment data sometimes yield depreciation and depletion expenses, but even these are suspect unless the corresponding physical asset data are also available. The income statement of the parent company is more than just a simple consolidation of the operating divisions' income statements. The company-wide statement embodies, in effect, all the nonoperating expenses, earnings, gains and losses that are not allocable to individual divisional statements.²⁵ These include: general (purely) corporate expenses, revenue earned at the corporate level and not derived from (or allocable to) the operations of any division, certain corporate interest expenses, equity in income or loss from unconsolidated subsidiaries and other unconsolidated investees (including minority interest), gain or loss on discontinued operations, so-called extraordinary items, and the cumulative effect of a change in accounting principles. In fact the difference between the corporation income statement *per se* and a simple consolidation of the corporation's divisional income statements, implicitly represents the residual "general corporate division" income statement referred to at various times earlier in this paper. But how, then, should this general division be industrially classified? The answer would depend on the residual "operating" revenues of this division. It is not difficult to imagine that the "operations" of such a division are not unlike those of a primary holding company (see section V) and so should be classified to one of the financial service industries.

Before continuing, an important point should be clarified. Our treatment of discretionary expense centers and, therefore, G & A services, implies that these units provide services only for intra-corporate purposes. Transfer prices may be paid and received for such services, but these are of no consequence in our particular context.²⁶ If what was formerly a discretionary expense center is permitted to earn revenue from outside customers, then the center (or part of the center) becomes transformed into an establishment, with its own *R-S* configuration. The new establishment must then be "placed" in one of the divisions, according to the industrial classification of its net operating revenue from sales to outside customers. Indeed, it is even possible that the new establishment, together with its own supporting discretionary expense center, might become a new profit center or new investment center if required X_0 accounting records are available. All this would change the divisional composition of the parent corporation and might even be sufficiently significant to change the official industrial classification of the corporation as a whole. Something of this nature appears to

²⁵For convenience, we limit our attention to the pre-corporate income tax situation. Nonoperating expenses include the flotation costs for loans and new equity and transfer costs involved in purchases and sales of financial claims for companies whose operations are not primarily financial.

²⁶When transfer prices are paid, the term "pseudo-establishment" is sometimes used.

have occurred when Citicorp decided to set up its vast network of communication services as a distinct profit center.²⁷

The distinguishing feature of a division statistical reporting unit is the availability of production-relevant “principal financial statistics.” So far the latter term has not been defined. Table 2 presents a proposed divisional financial statement that embodies “principal financial statistics.” It is now seen that the term implies a very truncated form of balance-sheet statistics. This calls for some explanation. The financial statement is oriented to determining a division’s own total investment base. Divisions do not generally have distinct (proprietorship) capital structures,²⁸ nor can divisions retain their own net earnings. So the main sources of capital—equity investment, preferred stocks, bonds, mortgages—are not relevant to the determination of an operating division’s investment base. The

TABLE 2
A PROPOSED DIVISIONAL FINANCIAL (BALANCE SHEET) STATEMENT

	\$	\$
Property	x x x	
Buildings	x x x	
Equipment	x x x	
Inventories	x x x	

Total physical assets		x x x
Cash (demand and savings deposits balance)	x x x	
Accounts receivable from outside customers	x x x	
Accounts receivable from other divisions	x x x	
Prepaid expenses to outside suppliers	x x x	
Prepaid expenses to other divisions	x x x	
Other allocable current assets	x x x	

Total current assets		x x x

Total allocable assets		x x x
<i>Less:</i>		
Accounts payable to outside customers	x x x	
Accounts payable to other divisions	x x x	
Prepayments received from outside customers	x x x	
Prepayments received from other divisions	x x x	
Other allocable current liabilities	x x x	

Total current allocable liabilities		x x x

Total allocable investment base for division		x x x

Note: This statement is mainly relevant to non-financial operating divisions. The corresponding statement for financial operating divisions requires specification of other categories.

²⁷See Bennett (1983); it is not known whether Citicorp’s communication services are also organized as a distinct division.

²⁸Unless the division is a corporate subsidiary (see section V).

latter, rather, is largely determined by the division's uses of capital employed in the division, i.e. excluding investments in other companies (or even investments in other divisions of the same company). Hence the division's "total physical assets" and closely-allocable "total current assets" are required. There are, however, some sources of capital that are relevant to the determination of a division's investment base and these are the items listed as "total current allocable liabilities" in Table 2. These items are, indeed, the only financing decisions that the typical division can influence. The division's own total investment base is then the simple difference between "total allocable assets" and "total allocable liabilities."

The precise content of Table 2 should be regarded as open for negotiation, though the basic standards explained above are in agreement with divisional internal reporting practices. There are problems of valuation and allocation; these are best discussed separately in the next subsection. At this moment, though, some further comments are needed. The item "property" in Table 2 should include depletable assets as well as land (a case can also be made for including intellectual property). Equipment used by a division under the terms of a financial lease should be allocated to this same division as if the equipment was owned by the parent company (see United Nations (1982, pp. 34-35)). On the other hand, if the equipment is used under the terms of an operating lease, then this same equipment is assigned to the lessor's divisional balance sheet and the lessee's rental payments appear in its income statement as part of G & A (intermediate) service expenses. All physical assets appearing in Table 2 should be valued at current replacement cost. If accounts receivable are handled centrally, then these accounts can be allocated to operating divisions on the basis of divisional sales revenue weighted for differences in the average length of credit allowed by different divisions. Accounts payable do not present difficult allocation problems so long as divisions do their own purchasing and are able to influence credit terms that suppliers maintain. Similar comments apply to other categories of prepayments made and received. It should now be clear what is meant by "investment base management expenses" used previously in Table 1. These are current expenses embodying controllership and treasury function services of the corporation that are directly or indirectly allocable to accounting for each operating division's total investment base as given in Table 2. Finally, the distinction between "outside customers" and "other divisions" is useful for cross-checking purposes and in the special case where the division is a corporate subsidiary.

Once again it is instructive to compare the division's financial statement with those of its constituent establishments and with that of the division's parent company. This is trivial to do since establishments *per se* do not possess financial statements, even of the truncated balance sheet variety shown in Table 2. Manufacturing census establishment-based data sometimes yield information relating to the buildings and equipment categories of total physical assets. And, of course, gross fixed capital formation and inventory change data may also be available, but that is all. There is no information relating to current assets and liabilities (or their flows) at the establishment-reporting level. The proposed divisional financial statement represents a feasible advance in this respect. The parent company, on the other hand, possesses a complete balance-sheet statement that

represents significantly more than a simple consolidation²⁹ of the component divisional statements. Indeed, once again, the difference between the company's balance-sheet statement and a simple consolidation of the operating divisions' truncated balance sheets implicitly provides the balance-sheet statement of the residual "general corporate division," preferably classified to one of the financial service industries.

One other point mentioned previously can now be clarified. The parent corporation's total interest expenses are partly allocated to operating divisions as noted in Table 1. The proposed allocation can be made to depend on relative divisional differences in total cumulative investment bases. In this case account is taken of both operating divisions and the "residual division," but with the residual division's total investment base³⁰ measured the same way as that of the operating divisions. All divisions belonging to the same company, according to this calculation, are in the "same boat;" all divisions are implicitly charged the same money rate of interest and there is no attempt to discriminate between divisions in the sense that some divisions, of the same corporation, might be relatively more equity-financed than debt-financed. If, on the other hand, some operating divisions are also corporate subsidiaries with their own distinct capital structures, then the required calculation would become more complicated.

This essentially completes our story of "what can the new statistical unit report?" It is interesting, though, to relate divisional income statements to their corresponding financial (balance-sheet) statements. The income statements ultimately yield the divisions' net operating incomes—divisional net earnings available for transfer to the parent corporation. The divisional balance-sheet statements ultimately yield the total cumulative investment bases upon which operating net earnings depend. What is so interesting about this relationship? The answer to this question is that the new statistical reporting unit can provide this relationship on an industrially more homogeneous basis. One would expect to find a significantly positive relationship between divisional net earnings and annual increments in the corresponding divisional total cumulative investment bases. The relationship, however, may also depend on divisional industry classification categories and on the particular corporation-wide earnings-investment complex in which each division operates.

IV.3. *Pitfalls of Accounting Numbers*

The statistical reporting unit proposed earlier in this section raises a number of accounting measurement problems that are usually discussed under the heading: accounting numbers versus economic values.³¹ These problems are not new and, indeed, the problems permeate traditional establishment-based data as well as company-based statistics. What is new is that the proposed divisional-type of reporting unit compels us to focus directly on the issues; the issues can no longer

²⁹Consolidation with respect to intracompany accounts receivable and payable and prepayments made and received.

³⁰The residual division's investment base reflects mainly corporate headquarters buildings and property, corporate cash balances and possibly other unallocable assets and liabilities categories listed in Table 2.

³¹See for example Harcourt and Parker (1969).

be “swept under the rug.” After all, the division reporting unit is a direct counterpart of its corporate management accounting entity. If such a statistical reporting unit is created then the associated national statistical agency must take some responsibility for the information content yielded by the unit. We will briefly discuss the major problem areas, but first it is appropriate to compare two basic statistical policy options that might be open to the national statistical agency.

One approach is that adopted by the Federal Trade Commission’s (FTC) line-of-business reporting program (see section III.3). Each division, or line of business, is required to provide supplementary information backing up some of the key accounting numbers. For example, the physical asset valuations are required both gross and net together with specification of the corresponding depreciation method (straight-line, double declining balance, and so on). In fact a breakdown of gross physical assets according to vintage is also called for. Similarly, the inventory valuation procedures must be made known. A division’s income statement is sensitive to common cost allocation methods and commodity transfer price arrangements. Therefore, the FTC requires detailed information from corporate divisions on each of these subjects. The general idea of this approach, then, is to provide the national statistical agency (or FTC) with a capability of adjusting reported accounting numbers to conform with supposed economic values. Sometimes these adjustments can also be made on the basis of reasonable assumptions combined with a computer-intensive methodology.³² It should be noted, though, that one reason why the FTC gives so much emphasis to the common cost and common asset allocation problem is that all commodity and factor costs and all physical assets are allocated to operating divisions; there is no significant role for the “general corporate division” proposed earlier in this section. The FTC approach to the problem of accounting numbers is not one we recommend in this paper. We do, however, recommend the FTC approach to industrial classification of divisional reporting units in the next subsection.

The second option open to a national statistical agency involves close cooperation with the appropriate business accounting standards board (FASB in U.S.A. and CICA in Canada). It is well known that accounting standards boards have been very active in recent years, particularly with respect to problems of inflation accounting. The concept of current replacement cost and valuation, basic to national economic accounts, has now been accepted by major commercial accounting standards boards.³³ Note that in replacement cost valuation, price-level changes between the time an asset was acquired and the current valuation date are taken into account together with deterioration and obsolescence that an asset may experience during its working life. Similarly, various FASB statements with respect to pension liability accounting and financial leases are consistent with national accounting precepts. The most recent CICA pronouncements relating to research and development accounting can also be acceptable to statistical agencies. Almost every day, of course, new accounting problems arise with the development of new technologies. For example, the SEC (and also FASB) are presently faced with the problem of “correctly” accounting for the cost of developing new computer software (capital asset? current expense?) by many

³²This is essentially what is done in analysis of inflation accounting.

³³See the discussion in Hibbert (1983).

computer software companies. The issue must be studied and guidelines established. Major corporations now have operating divisions specializing in this industrial service area. In all these cases, and others, there appears to be wide scope for cooperation between national statistical agencies and their corresponding accounting standards boards. The basic interests of the two bodies overlap and are, in a sense, mutually reinforcing. There is no need for a statistical agency to call for detailed “supplementary information” so long as the primary information is framed to meet the latest accounting standards guidelines. The two bodies, of course, must be responsible for ensuring that mutually consistent guidelines are met.

Finally, the two major “pitfalls” of divisional accounting numbers—common cost allocation and transfer prices—must be covered. Our recommendations concerning the two matters simply follow the latest sponsored work of the U.S. National Association of Accountants.³⁴ When two or more divisions experience common service or common administrative costs and when divisions share the use of common assets, then allocation problems arise. The problems are distinctly less severe when not all the corporation’s service and administrative costs and physical assets “must” be allocated to operating divisions. A good deal also depends on the industrial specification that the new statistical reporting unit is expected to follow. In any event, the large multi-division corporations are uniquely qualified to make their own divisional allocations without the need to report supplementary information. Service costs are typically easier to allocate than purely administrative costs. The evidence is that where “traceability” is not feasible, then corporations tend to allocate common costs and assets on an ability-to-bear basis using full actual costs rather than budgeted costs. There is scope, however, for improving the corporations’ allocation procedures by moving towards more sophisticated frameworks. One such framework is that provided by the Cost Accounting Standards Board embodying a distinct hierarchy of allocation bases.³⁵

When one division supplies commodities to another of the same company, then the choice of internal transfer price will affect both divisions’ income statements. It is possible to formulate a general rule for selecting an appropriate transfer price. The rule is (Benke and Edwards (1980, pp. 7–8)):

The transfer price should equal the standard variable cost plus the contribution margin per unit given up on the outside sale by the company when a segment (division) sells internally The application of the general rule depends on the characteristics of the market faced by the company and the company’s management control process.

One particular application of the general rule is to use the prevailing market price, when transferred commodities can be sold externally in perfectly competitive markets. The rule, however, is sufficiently general to handle cases where no external markets exist and to distinguish cases of supplying divisions’ idle capacity from full capacity. Also, the rule is congruent with division managerial incentives and corporate-wide profit maximization. There is evidence that this formulation

³⁴See Fremgen and Liao (1981) and Benke and Edwards (1980).

³⁵See Liao (1979) for a complete discussion.

is becoming popular among large multi-division corporations, but further research is required to extend the rule when transfer price systems operate under conditions of uncertainty and risk sharing.³⁶

IV.4. *Matching Microdata Sets and Related Issues*

This subsection covers the remaining issues to be resolved in our approach to the C-E problem. The issues are, again, mainly conceptual—reflecting the basic direction of the paper. First it should be clear that the proposed resolution of the C-E problem is microdata-oriented. The new statistical reporting unit is, by construction, an intermediate link between the company and its constituent establishments. There is, then, a company-division-establishment (C-D-E) complex in which each establishment is part of one division and each division is part of the company.³⁷ We know that establishment-based microdata sets exist; so do company-based microdata sets. A great deal of empirical effort, as reported in the literature,³⁸ has gone into relating and matching the two sets of microdata. The new statistical reporting unit, the division, then provides an additional microdata set each element of which is an intermediate link between a subset of the establishment-based microdata set and an element of the company-based microdata set. The intermediate link defines a pair of coupled matching relationships. Under conditions of exact matching, the two relationships each describe connections that are mutually exclusive and exhaustive with respect to their respective universes.

These considerations immediately illustrate a practical advantage of having a divisional reporting unit: each division acts as a natural organizer of ancillary unit data (e.g. discretionary expense centers, headquarters, distribution branches) which tend to “get lost” and misplaced in traditional C-E matching efforts.³⁹ The intermediate link provides a natural path through which establishment units can ultimately be matched up with parent companies. All this, however, is only effective if each operating division preserves unconsolidated establishment data and if a “residual division” is instituted so that the company must be a consolidation of all its divisions. Later we will show that matching of the exact type should dominate the empirical relationships. The paper, however, will not discuss technical problems of setting up common identifier codes and administering an exact matching microdata program.

Before continuing it might be mentioned that the institution of coupled C-D and D-E microdata sets provides a natural extension of empirical microdata studies. In the extended case, the gross margins of each division’s establishments contribute to the division’s net operating income which in turn is related to gross capital formation at the divisional establishment level. At the same time, the net income of each division contributes to the parent company’s total net retained earnings and these company-wide savings are then related to the annual increment

³⁶See for example Kanodia (1979).

³⁷Each division also includes discretionary expense centers and an investment base management center.

³⁸See for example Ruggles and Ruggles (1982b, pp. 38 and 42–43).

³⁹This is clear from Armington and Odle (1981); the authors use the term “branches” in place of ancillary units.

of the division's cumulative investment base. The two mentioned processes are connected by the fact that a division's establishments' physical assets are the most important part of a division's cumulative investment (asset) base. The new statistical reporting unit thus permits a more complex picture of the corporate internal savings-investment process. If the ultimate C-E savings-investment process is short-circuited by neglecting to consider D, then derived empirical relationships may tend to be "noisy". One way to cut down on such "noise" is to explain the intermediate communication channels—which is what the new statistical reporting unit really represents.

The remainder of this subsection will attempt to settle a number of outstanding issues. First there is the issue of to what extent the new statistical reporting unit will be based on the existing divisional internal units of major corporations. Perhaps enough has already been said on this subject to suggest that the existing divisional unit should be regarded as providing the accounting statistical standard, but not necessarily the ultimate reporting unit for the purposes of a national statistical agency. The situation here is not unlike that of the statistical reporting unit used for principal industrial statistics, namely the establishment—flexibility combined with reasonable allocation procedures must be the order of the day. In particular, the new unit should be supported by its own industrial classification system and guidelines by which the major corporations could implement the system with respect to their existing and created divisional units. The system and guidelines adopted by the FTC for the line of business reporting program have certain concrete advantages from the viewpoint of a national statistical agency: (1) the industrial classification system of the new unit is sufficiently homogeneous to permit divisional inter-corporate comparability, (2) the system is sufficiently flexible to be implemented by the corporation's own allocations, and (3) exceptions to the ruling guidelines are permitted in well-defined circumstances.⁴⁰ The organization of the FTC program was outlined in section III.3 and the reader is encouraged to consult the listed FTC publications for further details. There are however a number of respects in which the FTC program is not recommended: (1) there is no need to allocate all costs and physical assets to operating divisions, (2) the program should not be restricted to the manufacturing sector, but should cover all industrial sectors with large corporations, and (3) the manufacturing industrial classification system is probably too ambitious with respect to homogeneity ratio standards (even with exceptions). The FTC program also lacks microdata links to establishment- and company-based data reported to government statistical agencies. Thus the program cannot embody microdata matching studies of the type outlined earlier in this subsection.

The second issue involves a consideration that has probably already occurred to the careful reader. Suppose the new statistical reporting unit is implemented. What would be the relationship of this unit to existing segmented (external) financial reporting? And how would these two sets of reporting units be related to existing divisional (internal) financial reporting? First, as suggested in the previous paragraph, the new statistical reporting unit is built upon existing

⁴⁰For example, vertically integrated operations could be combined into one division even if homogeneity standards are violated. Also note that lines of business with less than \$10 million net operating revenues may be consolidated and reported as a single line of business.

divisional accounting standards with the support of a divisional SIC system and the corporations' own (extended) allocations. The corporation is free, however, to continue to use its original divisional reporting program for internal purposes. In fact the extended allocations required to satisfy a national statistical agency may also prove to be useful for the internal control and performance evaluation system of a large corporation.⁴¹ There does not appear to be a significant conflict of interest in this particular respect. The same cannot be said with respect to existing segmented financial reporting (see section II.2). The national statistical agency and its corresponding business accounting standards board must coordinate their efforts in order to avoid wholesale confusion. But how can this be done if the national statistical agency's reporting unit is to provide detailed income and financial statements with the usual confidentiality guarantees, while the business accounting standards board is primarily concerned with external disclosure? The answer to this dilemma is as follows: segmented external financial disclosure should become an aggregation (combination) and summary of the information provided to national statistical agencies by the new statistical reporting unit. In the light of segmented financial disclosure standards, this resolution of a potential dilemma is entirely feasible, provided that the minimum coordination effort is made (see also discussion at end of section V.1).

Finally, who must comply with regulations underlying the new statistical reporting unit? We would suggest all companies, public and private, with at least \$10 million in gross physical assets or \$15 million in annual net revenues. But this, again, is open for negotiation. The new reporting unit is oriented to relatively large companies so that exact matching should dominate empirical studies deploying a composite microdata base.⁴²

V. BEYOND THE COMPANY-ESTABLISHMENT PROBLEM

This section finally faces an issue that has been deliberately avoided so far in the paper. Section II introduced the assumption that each company (a corporation) is independent; hence the C-E problem. But one approach to the problem mentioned in section II.2 (approach "number five") goes beyond the simple C-E dichotomy to consider the position of the company in a group of closely-affiliated corporations, namely the enterprise (N). It is not difficult to imagine that the N-C-E trichotomy might offer a resolution of the type of statistical problems we have so far identified with the company and its constituent establishments. In this possible approach, each company is an intermediate link between the parent head of the enterprise and its own component establishments. The collection of affiliated subsidiary companies would approximate the role of the set of operating divisions—our "new" statistical reporting units—provided that each company could be satisfactorily classified by industry. Indeed the companies would do more than just that; each company is a legal entity and so possesses both a complete income statement and a complete balance-sheet statement. It would seem that our carefully prescribed divisional reporting unit can be dispensed

⁴¹This point is made in Lurie (1979).

⁴²For the contrast between exact matching and statistical matching, see United Nations (1979, pp. 25-32).

with! All this provides a considerable challenge to our basic thesis and this challenge will be met head-on in the next subsection.

Before continuing two further points should be mentioned. First, we still retain the basic presumption of the incorporated business sector through most of this section, but the presumption is relaxed towards the end of the section. Second, once the individual corporation is considered as part of an “enterprise”, then some intricate complexities are exposed such as the economic meaning of corporate ownership and control, and the accounting standards relating to consolidated balance sheets for groups of affiliated corporations. There are also legal complexities concerning the “rights” of creditors and minority shareholders. These considerations will, for the most part, be overlooked.

V.1. *What does the “Corporation” Label Designate?*

Separate legal entities comprising a corporate enterprise seldom reflect a disaggregation (deconsolidation) of the enterprise into standard classes of industrial activity. Existing corporate subsidiaries may arise from a series of takeovers or may be formed to minimize overall corporate taxes, to limit legal liability, protect company names, isolate risky ventures, or to merely hold and lease property. Indeed many corporate subsidiaries within an enterprise may be operationally unimportant and economically unviable—existing only for reasons of legal and historical convenience. On the other hand, a number of significant industrial production and service activities of a diverse nature may all be concentrated in one corporate subsidiary.⁴³ There is also the question of what constitutes the head of a corporate enterprise. The parent corporation may itself have significant and diverse operations as well as subsidiaries, or the parent may turn out to be a figurative holding company possibly separated from the rest of the group by several layers of intermediate holding companies.⁴⁴ Generally speaking, then, the individual company reporting unit, even if part of a large corporate group, is not an effective substitute for a well-supported divisional statistical reporting unit. National economic statisticians can influence the nature of a divisional reporting unit, but statisticians have no influence on the particular configurations of legal entities. We must, nevertheless decide how the new statistical reporting unit is to be organized in the presence of closely-affiliated companies (the enterprise). At least two more cases should be distinguished.⁴⁵

A corporate enterprise is often characterised by the existence of a consolidated income statement and a consolidated balance-sheet statement with consolidation over all affiliated companies. Indeed, when each member of the corporate family is clearly owned and controlled by the same interests, then the deconsolidated individual corporate statements may have little economic significance⁴⁶ (unless a particular company coincides with a well-classified divisional reporting unit). This is precisely the reason why segmented accounting disclosure standards

⁴³Good discussions of these issues are available in Solomons (1968), Miller and Scott (1980) and they are also mentioned in United Nations (1977).

⁴⁴Some problems of consolidated accounting for intermediate holding companies, particularly when a parent becomes a subsidiary, are given in Jordan (1977).

⁴⁵The case where the company is independent has already been dealt with.

⁴⁶Aside from the legal requirements of creditors and minority shareholders.

such as FASB and also the FTC line of business program are directed towards the corporate enterprise as a whole. Therefore, the enterprise financial statements⁴⁷ should ultimately be a consolidation of divisional financial statements with divisionalization performed over the full diameter of the enterprise's activities. When confronted with a corporate enterprise, the national economic accountant's focus should be on the enterprise-wide statistical reporting units, the divisions, and not on the prevailing idiosyncratic legal structure of the enterprise. In this case the traditional C-E statistical problem is effectively handled by an N-D-E resolution. This is likely to be the most important case in which the new statistical reporting unit will be developed. (Further discussion of this case can be found in the original version of the Conference paper.)

A second case arises when the corporate enterprise does not, or legally cannot, possess an overall consolidated set of financial statements. This situation is usually present when the common-ownership interests encompass both non-financial industrial activities and purely financial-operating activities (the latter should not be confused with the non-operating financial activities of the "general corporate division"). In this case there is no real choice other than to consider some (set of) corporations as independent even though there may exist substantive operating and financial links to other corporations controlled by the same interests. The appropriate consolidation and divisionalization properties should then be satisfied for the maximum⁴⁸ set of corporations for which an overall pair of consolidated financial statements either exist or can be made available.

A third case can also be mentioned briefly. Two corporations belonging to different enterprise families may come together to form a joint venture with respect to a specific set of industrial activities. Some joint ventures could become large and diversified⁴⁹ and, therefore, subject to divisionalization as multi-statistical reporting units. The question arises as to how such divisions should be organized. If the joint venture is equally owned and controlled by the two corporations, then the joint venture itself forms a distinct body which, in many cases, is also a legal entity. This is in accord with the statistical principle that each establishment must have a single ownership. The joint venture is regarded as one independent corporation and divisions are organized in the usual way. It is possible to introduce more sophisticated treatments of this matter and consider the extent of ownership ties, if any, between the two participating corporations through their respective enterprise families. Such treatment will not be pursued in this paper.

Before considering problems relating to the unincorporated business sector and government sector of the economy, there are two items that need clarification. First, the FTC line of business reporting program excludes both domestic regulated branches and all foreign branches of the large manufacturing enterprises from the compliance requirements. This exclusion appears to be due to the particular orientation of the FTC program. The FASB segmented financial dis-

⁴⁷The term financial statements is now used to signify the pair of income statement and balance-sheet statement.

⁴⁸Maximum, say, with respect to consolidated annual net revenue or consolidated net worth.

⁴⁹An excellent account of this issue can be found in Herman (1981, pp. 203–212). Joint ventures are sometimes known as quasi-mergers.

closure requirements do not indicate any such exclusion. If foreign operations are included in a divisionalized reporting program, then such operations are likely to be aggregated as a single division (not subject to industrial homogeneity standards).⁵⁰ This leads to a second item: the possibility of international cooperation and compatibility between national statistical agencies in implementing the new statistical reporting-unit program. The foreign operations of one country are the domestic operations of another. This may be the only way to completely track down appropriate financial statements for the large multi-national enterprises on a reasonably homogeneous industrial basis. Needless to say, nonoperating gains and losses from foreign exchange transactions must be correctly accounted for.⁵¹

V.2. *Beyond the Business Corporation*

So far this paper has examined the C-E problem (or, more precisely, the C-D-E and N-D-E resolutions) in the context of the incorporated business sector of the economy. This is the sector that features the large multi-establishment multi-industry legal entities and where the case for a new statistical reporting unit is strongest. More important, perhaps, is the fact that the incorporated business sector is precisely where divisional units, for corporate internal financial reporting, already exist. It should be noted, though, that the presence of large business corporations does not guarantee that multi-division reporting for statistical purposes is necessary. In the cases, for example, of large transportation companies and large public utility companies, their production unit establishments are likely to report on a kind-of-activity basis that may be sufficiently broad and supported by sufficient accounting records to approximate the statistical requirements for a division. In this case, then, the establishment coincides with the division.⁵² It might also be mentioned that our implicit description of the business sector covers government-owned enterprises that parallel activities performed by the private sector and that operate on a profit-seeking (not profit-maximizing) basis. The appropriate legal entity for government enterprises, at least for our purposes, would then be the largest unit for which a pair of complete and consolidated financial statements are available.

With this background it is now easy to show what happens when we move out of the incorporated business sector.⁵³ The unincorporated business sector is no problem so long as distinct and complete financial statements exist for the business operations and finance (distinct from the particular personal owners of the business). Unincorporated businesses are liable to be small and of insufficient size and diversity to raise divisional reporting units. Next consider the producers of private non-profit services to households and business. In many cases, the legal entity itself provides the appropriate establishment-reporting unit, so the division entirely disappears. When the legal entity covers a number of different

⁵⁰The foreign operations, however, may be subject to a geographic divisionalization if the operations are sufficiently large.

⁵¹This latter point is also made in OECD (1983).

⁵²Of course, the establishment will also coincide with the division for almost all small business corporations, but in these cases division statistical reports will not be requested.

⁵³Guidelines indicated by United Nations (1968, Chapter 5) were useful in the following brief discussion.

establishments normally assigned to different industries, then there may be a role for distinct divisional-reporting units, but such a situation is most unlikely. One might say that there is one division, coinciding with the legal entity, or there are several divisions, each coinciding with one of the establishment-reporting units that are distinguished. Which view of the division is correct would depend on the availability of appropriate accounting records, but the issue is of no substance to a national statistical agency since distinct division reporting is not required. Finally consider the producers of government services. It is well known that establishment-reporting units for the government sector are already broad and diverse. These units, though, may still not embody sufficient accounting information to be identified as “coincident” divisions. The implication here is that the need for a new statistical reporting unit with respect to the government service sector is not evident from the conventions of national economic accounting.

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