

3. Coverage and Classifications

A. Population Coverage

A.1 Economic activities included in the population coverage

3.1 Although the scope of a PPI may include all domestic goods- and service-producing establishments, traditionally the PPI has been compiled as a measure of price change for the goods-producing sectors of the domestic economy. These include agriculture, forestry, and fishing; mining; manufacturing; and public utilities.

3.2 The construction sector has generally not been considered a component of the traditional goods-based PPI. This may be less a matter of definitional consistency and more a function of the difficulty in constructing meaningful and accurate price measures for this sector. Chapter 10 discusses in detail the problems associated with price measurement in this sector, largely due to the uniqueness and complexity of any particular construction project. Successful approaches to surveying construction have relied on techniques that differ significantly from methods employed in manufacturing.

3.3 The services sectors that are in scope for a PPI vary across countries. Many countries are interested in creating a corporate services price index. This restricts coverage to business services, including professional services, finance, insurance, real estate, accommodation and food, information, communications, and the transportation of goods. A more expansive definition could include all services transactions that are in intermediate demand. This would encompass wholesale trade and the intermediate demand component of retail trade, transportation of people, and educational services. Finally, a number of countries are working toward an economy-wide PPI. This would bring all non-goods-producing sectors for both final demand and intermediate demand within the domain of a single PPI index.

A.2 Class of buyer coverage

3.4 Practices among countries differ greatly on whether all or only some final demand transactions are within scope of the PPI. From a practical perspective, the decision on whether to include transactions directly to consumers, the personal consumption expenditures (PCE) portion of GDP, relates to whether the PPI program is industry-based or commodity-based. An industry-based sample design readily lends itself to including both intermediate and final demand transactions. The sample unit and survey respondent almost always can provide data for both classes of transactions. Often it is difficult for the respondent to report only on intermediate demand transactions. In the case of air passenger transportation, records are generally not available to distinguish between a business traveler and a vacation traveler.

3.5 Chapter 5 provides more insight into sampling frame issues and the inclusion or exclusion of direct sales to consumers. Ultimately, the decision to include any or all sales to final demand is a scope question. Frame sources and sample designs could be made to support either choice. If the CPI covers personal consumption expenditures, it is duplicative and costly to similarly cover these transactions in the PPI. This is an issue to some extent in the goods sectors, such as electric utility sales to households. But it is much more significant in the services sectors, where direct sales to households are frequently encountered. An alternative could be to coordinate surveying activities across the CPI and PPI programs. This issue should be resolved prior to undertaking any expansion of the PPI into the service sector.

3.6 For deflation of the national income accounts, it appears to be highly desirable to calculate and publish indices that are differentiated by GDP category. A semifinished good, such as a semiconductor wafer, sold as an export would belong in the export component of final demand. A similar good sold in the domestic market would appear in inter-

mediate demand. A passenger car sold to a corporation for internal use would belong in the fixed domestic investment component of final demand. The same vehicle designated for sale to households would appear in the PCE component of final demand. Tax accounting services provided directly to households would appear in PCE, a final demand component. Similar services provided business-to-business would appear in intermediate demand.

3.7 Resource and respondent burden constraints and data availability may well preclude the PPI program from publishing along GDP categories. Given adequate sample size, index accuracy in this instance is enhanced by calculating indices by type of buyer to conform to GDP categories. Where this is not possible, the alternative is to calculate a single index, such as passenger cars, and apportion the weight among the various passenger car indices published using input/output data from the national accounts. For example, a single tax accounting index could be calculated. That same index could be mapped into a stage-of-processing structure by using I/O weights to apportion the total commodity output weight between intermediate demand and final demand.

A.3 Nonmarket goods and services

3.8 Most countries have defined nonmarket activities as falling outside of the scope of the PPI. Examples of these activities include general government services such as national defense and the value of owner-occupied structures. Situations may exist where one class of customer may receive the service with no charge while another class of customer may pay a market price. That is the case with local government-run hospitals in the United States, where payment is determined by family income exceeding a legislated value.

3.9 A different issue is whether to include in the scope of the PPI any revenue-generating activity, even if it is a small portion of the economic activity of the establishment. For example, should the gift shop sales of a state-owned museum (let us assume a free admissions policy) fall within the scope of the PPI? Or should the establishment be deemed to be out of scope because most of its activities are supported by general tax revenues? The decision on what to include in the PPI is generally made on the basis of program resources. Establishments and/or entire industries with few market-priced activities are generally excluded from the PPI. It is deemed

too expensive to survey the establishment for such a small return.

A.4 Import and export coverage

3.10 On a conceptual basis, the inclusion of exports and exclusion of imports conforms to the measurement of output price change consistent with index use for the purpose of GDP deflation. In contrast, the inclusion of imports and the exclusion of exports is consistent with demand-based index use. Both formulations are highly meaningful for a variety of important data users. Please refer to Chapter 2 for a discussion of PPI uses and major aggregations. Resources permitting, both import and export price data could be incorporated into different PPI aggregations to form different families of indices. However, the PPI concept is generally associated with output measurement. This is inclusive of exports and exclusive of imports.

3.11 Overlap considerations with an import and export price index program raise considerations about whether nonduplication of export pricing is feasible. The PPI need not include export pricing to still meet some needs of GDP deflation, since exports are a separate GDP category. Identification of goods destined for export, however, may be a problem. Where reimbursement of VAT occurs, such identification may be straightforward. In other cases price discrimination between domestic and export sales may exist but may involve dealing with very different respondents within the enterprise to secure survey data. The use of I/O table weights at least solves the weighting problem.

A.5 Globalization and e-commerce considerations

3.12 The e-commerce revolution, coupled with globalization, is having a substantial impact on determinations of population coverage. The outsourcing of production, and globalization, are redefining the role of many business enterprises. An enterprise that had been a major manufacturer may now outsource all production to establishments based in other countries. The enterprise may not even provide the material inputs to the production entity because it is more cost-effective to allow the production entity to arrange its own inputs utilizing just-in-time inventory techniques. If the fabricated good is repatriated before marketing, this leaves the domestic enterprise only a wholesale trade margin

output-generating activity. However, the enterprise is busily engaged in new product development and prototyping. These are the main wealth-generating activities for the modern corporation. But the enterprise has its output valued as wholesale margin rather than as manufacturing with a gross sales output valuation.

3.13 A related phenomenon is the establishment of virtual corporations to manufacture a new product with a quite short expected life span. The virtual corporation may be production facilities that can be quickly converted to different manufacturing activities to produce items on a contract basis. The virtual corporation can be established by a consortium of firms with different skills coming together briefly to manufacture a new product with a short expected life.

3.14 In both cases, the PPI program is challenged to review its concepts of domestic production and manufacturing. Criteria for manufacturing may need to be revised to give primary weight to new product design and prototyping, while discounting the importance of actual production. The boundary between manufacturing and wholesale trade may need to be reestablished in recognition of this. Finally, the statistical agency can be expected to be challenged by the speed with which these partnerships are formed and dissolved. Traditional surveying methods may be too slow and cumbersome to permit inclusion of short-lived virtual corporation partnerships in the PPI program. New surveying methods may need to be developed in order to ensure coverage of this most dynamic part of the economy.

B. Price Coverage

B.1 Order prices and shipment prices

3.15 The appropriate price to obtain from a theoretical perspective should be the price at the time there is a change in ownership from the producer to the buyer. Unfortunately, it may be too difficult to adhere to this theoretical requirement uniformly in practice. Therefore, statistical agencies have generally used the concept of shipment price for the actual transaction occurring as close to the survey pricing date as possible. In most circumstances the shipment price is final at the time of delivery to the customer. There are situations where

the shipment price cannot be finalized until well after shipment. An example of this is the case of cumulative volume discount. This could necessitate using an estimation procedure, such as reliance on the previous-period cumulative volume discount, to best approximate the current transaction price. The construction sector presents special problems in that prices are often renegotiated upon completion of the activity. Often, unforeseen circumstances encountered in performing the activity require renegotiation. Chapter 10 further discusses problems associated with measuring price change in the construction sector.

3.16 Order prices refer to the price quoted at the time the customer places an order. There usually will not be any difference between order and shipment prices. For some classes of goods, however, such as aircraft and ships, there may be a period of months or even years between the placing of the order and the actual shipment. No output would have been generated when the order was placed, and the final shipment price would likely reflect some form of price escalation to adjust the order price to account for subsequent cost increases. These considerations may make the use of order prices questionable for such goods that have an extended production period given the uses to which the PPI is put such as GDP deflation.

B.2. Net transaction prices

3.17 Net transaction prices are actual shipment prices received by the producer for the sales transaction of a good or service to a customer. The price includes the impact of all discounts, surcharges, rebates, etc. for a unique customer or unique class of customer. The statistical agency is not always able to obtain a transaction price net of all discounts and inclusive of all surcharges. Of greatest concern is the ability to secure a type of price whose movement closely proxies the movement of a net transaction price. The inability to include a cash discount will not affect the measure of price movement if it is a constant. But the failure to include competitive discounts, which can be expected to vary considerably over time, may well compromise the accuracy of the index.

3.18 There are a variety of different types of price that may meet the definition of the net transaction price. These include contract prices, spot market prices, average prices, and intracompany transfer prices. The different types of price are

treated separately below, and limitations and problems associated with their use are also discussed.

B.2.1 Contract prices

3.19 Contract pricing generally refers to a written sales instrument that specifies both the price and the shipment terms. The contract may include arrangements for a single shipment or multiple shipments. The contract usually covers a period of time in excess of one month. Contracts are often unique in that all the price-determining characteristics in one contract cannot be expected to be repeated exactly in any other contract. The challenge is to maintain a constant quality methodology over time, especially when the contract expires and item substitution is necessary.

3.20 Contract terms may be unique to each agreement in terms of customized product features, negotiated price tied to the unique buyer-seller relationship, or quantity differences. In addition, contracts reflect supply and demand conditions at the time the contract is entered into. At best, price adjustments for long-term contracts can be made for input cost changes. But a long-term contract does not reflect current-period market conditions for new transactions.

3.21 To attain an accurate index where contract pricing is widespread, especially in the short term, a larger item sample is necessary. This is to reflect the proper proportion of new contracts or renegotiated contracts being entered into each pricing period. Assume that all contracts for the purchase of new machine tools are for three years' duration. If only one item is tracked in the PPI sample, it would be three years before any price change due to new supply and demand conditions would affect the price (at contract renegotiation). With an item sample of ten contracts, all with different contract expiration dates, the index would better reflect actual price conditions for machine tool contract sales because contract renegotiations would be encountered much more frequently than once every three years.

B.2.2 Spot market prices

3.22 Spot market price is a generic term referring to any short-term sales agreement. Generally, this refers to single-shipment orders with delivery expected in less than one month. Goods sold on this basis usually are off-the-shelf and, therefore, are not subject to any customization. These prices are sub-

ject to discounting and directly reflect current market conditions.

3.23 Spot market prices can be extremely volatile. The pricing methodology employed can be critical in minimizing the volatility encountered from these phenomena. It is advisable to take several measures during the current month and average them. Crude petroleum and agricultural products are particularly prone to extreme short-term volatility. Of course, it becomes extremely difficult to interpret aggregate data when highly weighted subaggregations, such as food and energy, are subject to high price volatility. We do not know if a measured change from one month to the next is due to the particular point in the month that the price(s) was/were collected rather than being a change sustained over most or all of the month. With volatile prices, a better solution may be to collect average prices, although these have their own weaknesses as well.

3.24 A more subtle index distortion can be caused by a nonrepresentative mix of contract and spot market prices. If the goal of the index is to accurately reflect price movement for the population of transactions in the current period, the proportion of index items falling into each category must be accurate. Contract prices cannot be expected to move similarly to spot market prices in the short term. Business users of the PPI may well prefer an index of spot market prices because these best reflect current market supply and demand conditions. This is quite useful for new purchase decisions. However, GDP deflation requires a price measure reflective of all transactions in that product area. The PPI cannot hope to meet all user needs and must focus on its primary goal of accurately representing all transactions.

B.2.3 Average prices

3.25 Average prices reflect multiple shipments of a given product within a consistently defined time period. Often, reporters can readily provide such data on a weekly or monthly basis. Usually, average pricing is possible for commodities or very simple and standard manufactured goods. The advantage of average pricing is that it very effectively increases the number of price observations used to calculate the index, thereby reducing variance. An average price should meet two requirements:

- The price is reflective of the current time period, and
- The price relates to homogeneous transactions.

3.26 It is often impossible to secure a price that meets both requirements. Companies often compute average prices on a monthly basis. By the time they are computed and provided to the statistical agency, they become one-month lagged prices. If the product area is characterized by extreme volatility, a one-month lagged price may be unacceptable.

3.27 The problem of product mix can also be difficult to overcome. Machinery and equipment often are sold with a choice of relatively expensive options. Automobiles could include as options air conditioning, traction control, antilock brakes, and leather upholstery. If the manufacturer were to provide an average price for all cars sold of a particular model, it would include a mix of optional equipment. The options mix could vary significantly from month to month. This causes significant variance in the index and largely compromises the ability to perform meaningful short-term price analysis.

3.28 The problems associated with average prices tend to compromise the short-term analytical capability of the index. However, in certain circumstances they may enhance the accuracy of long-term index movement. For example, in the United States the index for telecommunication services relies on average prices with a known product mix problem. The industry is characterized by the frequent introduction of new calling plans, which any customer can switch to at the customer's discretion. These new plans are competitive discounts. The average pricing methodologies capture these discounts on a current-month basis. Any other pricing methodology, such as pricing a specific bill, would not capture this discounting. Thus, this price index on a long-term basis is more indicative of industry pricing trends using average prices, but there is significant variability on a month-to-month basis. This average price approach assumes that the product mix fluctuations are some fixed long-term proportion. Where this assumption does not hold, which is often the case, the average price alternative would not be an acceptable alternative because of the shifts in product mix that are likely to occur in long-term comparisons. The statistical agency needs to carefully explore the characteristics of an average price before establishing such a pricing mechanism with a new reporter.

3.29 Average prices have the advantage of representing the entire population of transactions for a particular good or service. Therefore, the concern when pricing a single transaction of holding transaction terms constant does not apply.

B.3 Subsidized prices

3.30 Subsidized prices are considered to differ from market prices in that some significant portion of variable and/or fixed costs are covered by a revenue source other than selling price. The following subsidies can be encountered:

- Fixed or variable subsidy on a per unit sold basis. For example, a monthly rental subsidy per apartment determined by the family income of the tenant.
- Budget subsidy where a service provider, such as a government-owned hospital, receives both an operating budget and capital budget annual allocation. Patients with a demonstrated ability to pay may be charged an economic price. Less-fortunate patients are either charged reduced rates or receive free service.
- Cross-subsidy where activity A of the service provider generates sufficient revenue to allow activity B to charge a noneconomic price. Tuition charges at a university may well subsidize research activities.¹

3.31 Subsidized prices must be researched to determine whether they proxy market prices and should be used directly in the index or whether they must be adjusted to best reflect proxies for market prices.

3.32 In the case of fixed or variable subsidies directly on the sale of a good or service, the price could reflect the price to the customer plus the subsidy amount. Budget subsidies could be apportioned on a per unit sales basis if the respondent's accounting system is designed to support this calculation. This is much more problematic.

3.33 Cross-subsidization either requires reliance on the reporter's accounting system to allow for price adjustment or requires bundling of the different services into a more broadly defined index.

¹Cross-subsidies within a sample unit are generally excluded for PPI purposes.

B.4. Intracompany transfer prices

3.34 Intracompany transfer prices are of increasing importance as globalization progresses, as discussed in Section A.5. Intracompany transfer prices are defined as the value assigned on a per unit or per shipment basis to goods shipped from one establishment of an enterprise to another. Ownership of the good does not change hands, so the value assigned to the shipment is not a market price. Where there is a vertically integrated enterprise, these shipments cross industry lines and account for revenue within that product line. Therefore, they are reflective of output-generating activity in the domestic economy.

3.35 One of the primary goals of the PPI is to help determine the magnitude and direction of price movement on both a macro- and microeconomic level. Price movements at earlier stages of processing or within intermediate demand are often of the greatest interest to policymakers concerned with price inflation. For such a use, any index containing nonmarket prices not paralleling market price movement is of dubious value. Intracompany transfer prices may well distort price analysis of market trends in the domestic economy.

3.36 It is generally recognized that the statistical agency must research the basis for setting intracompany transfer prices to determine how closely they proxy market prices. Often, vertically integrated companies establish separate profit-maximizing centers (PMCs) and allow the use of market measures to determine the performance of each unit. In such instances, intracompany transfer prices generally meet the test as good market price proxies.

3.37 Where tax considerations are important in price setting, intracompany transfer prices are generally poor proxies. Internationally traded goods might have valuations set to minimize import tariffs and corporate taxes. The statistical agency may decide to exclude such intracompany transfer prices from the index when they are judged to be accounting entries with no relation to market prices or values sensitive to taxation. On the other hand, to the extent that such activity is a significant portion of an industry's output, it is important to get the best proxy prices available because they will be needed to derive the industry PPI for use as a deflator in compiling GDP. In the case of exported goods,

these may be the only prices available, and they will reflect the actual export values.

B.5 Discounts and surcharges

3.38 Discounts and surcharges are adjustments to the list price available to specific customers under specific conditions. The list price may not be a market price because no goods are ever sold at that price, or only a subset of customers purchase goods at that price. All or most transactions may occur with adjustments to the list price that reflect specific market conditions that may or may not be of long duration. Changes in discounts are a major problem for the accurate reflection of price movement. These adjustments often affect various customers differently and are of major importance in calculating an accurate and representative price measure. Sole reliance on list or catalog prices generally invalidates the price measures even for long-term analysis. Because prices posted on the Internet are usually real offered prices and transactions made through the Internet will be at those prices, it will be interesting to see if e-business activity mitigates against this problem and causes companies to advertise transactions prices generally. This could largely eliminate the difference between list and actual prices for most price adjustments (except, perhaps, quantity and prompt payment discounts) and still allow for special terms to valued customers.

3.39 Discounts generally fall into the following categories:

- Competitive discounts reflect unique supply or demand conditions, generally in specific markets for the good. These discounts are generally of short duration in any specific market area but may be applicable in at least one market area on a frequent basis.
- Prompt payment discount for remitting payment within a fixed time period such as ten days. These discounts are generally of small magnitude, remain unchanged for long periods of time, and are available to all customers.
- Quantity discounts are generally tied to specific order sizes and increase with the size of the order. These discounts are generally available to all customers.
- Class-of-customer discounts are specific to certain classes of buyer. Trade discounts are available to wholesalers to help cover their selling expenses. Advertising discounts are available

to retailers to help cover their promotional expenses. These tend to be expressed as percentages and remain unchanged for long periods of time.

- Financing discounts relate to providing assistance to customers to pay for the good they are purchasing. They may serve as a buy-down on the bank loan interest rate for the customer's borrowing to pay for the good. Floor plan allowances for automobile sales from the manufacturer to the dealer involve a rebate to the dealer to effectively buy down the interest rate charged the dealer by a bank lender.
- Price rebates are discounts paid to the customer after the actual transaction has occurred.
- Cumulative volume discounts are offered to customers who purchase a certain amount of an item in units or sales in several shipments over a specific period of time.

3.40 Surcharges are additions to the listed price. These are generally of short duration and reflect unusual cost pressures affecting the manufacturer. Examples include fuel surcharges for trucking companies.

3.41 The constant quality assumption underlying any index requires that the statistical agency must hold transaction terms constant. Quality adjustment would be required for any change in discounts included in the pricing specification similar to a change in product characteristics. A related problem would be a change in discount terms, such as changing the shipment size intervals for a quantity discount. One way to guard against this problem is to specify the exact quantity shipped in the item specification. Similarly, if a particular class of buyers is specified, any subsequently encountered type of buyer discount can be treated as a price change not requiring quality adjustment.

3.42 The inclusion of all appropriate discounts and surcharges is essential for ensuring index accuracy and utility. Certain discounts tend to remain unchanged for long periods, such as trade discounts and prompt payments discounts. Other discounts and most surcharges are highly sensitive to changes in input costs, competitive conditions, and interest rates. Often, manufacturers leave list prices unchanged while discreetly discounting for preferred customers or more astute buyers. Lack of information by purchasers can often greatly affect pricing strategies. It is entirely possible for a list price in-

dex and a net transaction price index to move in different directions.

B.6 Agricultural prices

3.43 For many agricultural products the prices collected should be "farm gate" prices—that is, the per unit prices received by the farmer for each product sold as it leaves the farm. In most cases this will represent an average price for each product. Such average prices are usually acceptable because they represent the unit cost of a single, homogeneous product. Often the price may include transport costs of the product by the farmer to a delivery point designated by purchasers. Such costs, to the extent that they are not separately billed by the farmer to the recipient, would be included in the price of each product. This follows the same principle as that of the *1993 SNA* regarding transport costs—to the extent that shipping costs are not separately billed but are included as part of normal business practice, they are a component of the basic price. The product description should include this as part of the product specifications.

B.7 Structured product descriptions

3.44 For each product transaction that is selected for price collection, the statistical office should maintain a detailed description of the important characteristics associated with the product and type of transaction. These should include all the characteristics that the establishment uses to determine the price. Chapter 6 on price collection advises documenting complete descriptions for each product in the PPI, each description containing the most important price-determining characteristics of the product. Chapters 7 and 21 make strong cases for setting up this documentation in a structured way, allowing product characteristics to be coded into binary and continuous variables. Coded or structured descriptions enable systematic tracking of product specifications and easier discovery and identification of changes in specification when establishments discontinue or modify the products they sell. They also are a prerequisite for statistical analysis of the impacts of product characteristics on product prices and, thus, for using hedonic techniques, among others, for quality adjustment. Structured product descriptions are discussed in more detail in Chapter 6.

C. Geographic Coverage

C.1 Treatment of imports and exports

3.45 Because the output PPI is a measure of price change for marketed domestically produced output, import prices are excluded and export prices are included. See Section A.4.

3.46 By definition, this requires that foreign purchases of residents (imports) should be excluded. In addition, domestic purchases by nonresidents (exports) should be included.

3.47 If the PPI is constructed as a purchaser's index, it is largely impossible to adhere to the geographic coverage parameters. Much of the intermediate demand sales flow through the wholesale trade sector. It becomes increasingly difficult to distinguish import items when inputs are purchased from wholesalers. It is also difficult to apply appropriate domestic expenditure weights in sampling. Exports would be missed entirely for shipments direct from manufacturers to overseas buyer. These are rather convincing reasons to construct the PPI as a producer's index.

3.48 Regional indices are generally unnecessary in the PPI. Production facilities may well be spread throughout the nation. But often they are aggregated within a single profit-maximizing unit, which sets a single selling price. Regional price differentiation is quite rare. Some sectors, such as power generation in public and private utilities and construction, evidence regional repricing. But these are exceptions.

D. Statistical Units

D.1 Characteristics of statistical units

3.49 A statistical unit in the PPI should refer to a single output-generating entity. Separate auxiliary establishments, such as sales offices or administrative offices, are important to the extent that they may be a record center or reporting unit for activities of several entities.

3.50 A statistical unit, analogous to the SNA establishment concept, is organized as a single decision-making unit. All operations within the sta-

tistical unit are coordinated to accomplish the goal and objectives of the unit. This could encompass activities such as price setting and the setting of production limits.

3.51 The statistical unit may consist of one or many operating establishments organized to utilize inputs efficiently and effectively, compartmentalize production activities, and generate output.

3.52 For sampling purposes, a clustering of units may occur when the various physical locations report to a single record center. The record center is expected to house sufficient production, engineering, accounting, and marketing data to permit full ongoing participation in the PPI. This would include product and transaction data and data to permit repricing and quality adjustment.

D.2 Operational problems in identifying sample units

3.53 E-commerce is causing a shortening of production life cycles for new products. Computerized networks that control all phases of the production of products permit the formation of virtual corporations to come together expressly to produce a product with a short prospective life span. The virtual corporation is the creation of a partnership among several companies sharing complementary expertise. With the conclusion of the product's life span, the corporation is disbanded.

3.54 Traditionally, PPI programs have relied on administrative records or surveys of output for a sampling frame. Industrial sectors are resampled on a periodic basis, and resampling activities require a considerable time period to be completed. Thus, the traditional approach is largely unsuited for the timely inclusion of virtual corporations into the index. They are unlikely either to be identified in a sample frame or to be amenable to providing prices over a period of time. New approaches are needed to identify and incorporate these entities into the PPI.

3.55 Another problem associated with e-commerce involves incorporating Internet and electronic data interchange (EDI)² sales into the PPI.

²Electronic data interchange is a secure method for computerized communications between two unrelated parties. A great deal of e-business is done on the more secure EDI
(continued)

Historically, the PPI captured transactions consummated by a physical exchange of paper. Now the statistical agency must determine if e-business transactions exist and which PMC or record center would provide PPI survey-related data encompassing these transactions. This may involve the identification of new record centers in the same corporation.

3.56 A related concern is whether the corporate structure has been altered to accommodate e-business. The enterprise might establish an e-commerce sales corporation to handle all e-business transactions. Should the PPI collect the intracompany transfer price between the manufacturing PMC and the sales corporation or the sales corporation price to the customer? As a general rule, mentioned previously, the price most reflective of the net transaction market price should be used.

3.57 A final concern relates to the outsourcing of production activities. What activities must be conducted by the originating company for it to remain as the producing sample unit? If the sample unit designs and prototypes the product, outsources production, and then markets the product, is it still in manufacturing? Has it become the wholesaler? What if the material inputs are not purchased and owned by the designer/marketer? What if the outsourcing is done by an overseas company, and the product is not repatriated before it is marketed? Traditional definitions of an output-generating sample unit appear to be deficient in offering guidance on how to handle pricing for many of the new industrial organizational relationships now in common use.

E. Classification

E.1 The role of classification

3.58 The classification structure largely determines the scope of price collection for the sample unit. The sample unit is chosen to provide data for a particular economic sector as defined by the classification system. If the sample frame covers a four-digit ISIC (International Standard Industrial Code) industry, the statistical agency is concerned with selecting representative items falling within the four-digit product scope.

rather than the Internet. Although, as security increases on the Internet, EDI may become less utilized.

3.59 The classification system provides an organizing structure and is the first step in surveying. Once the subaggregation within the classification system is selected, an appropriate frame can be found from which to select representative industries or products for inclusion in the index.

3.60 Similarly, the classification structure forms the index structure and defines which product line or industry or aggregate weights are needed. Not coincidentally, the classification system serves as the basic language allowing the turnover survey and PPI survey to have a direct concordance. This, of course, is of great benefit to the PPI, the national income accountant, and the sophisticated data user.

3.61 A classification system must meet certain criteria to be useful to the PPI practitioner. The classifications must largely reflect the realities of industrial structure and reflect current-period production. The classifications must be relevant for long time periods to permit time-series analysis. The classifications must be mutually exclusive, easy to interpret and communicate, conform to real world categories, and be all-inclusive. The aggregation structure employed in the classification system must conform to the real world.

3.62 Individual product specifications selected for inclusion in the survey must map into one and only one classification category. This lowest level of classification ideally should conform to an economic product line definition (it would be assigned a unique product code). This would relate to homogeneity in use and price behavior. While this lowest level of classification (a product line composed of relatively homogeneous products) would most likely be too detailed for publication purposes, it would meet a variety of needs. The detailed product line level would define the class of goods available for any needed item substitution to replace discontinued goods. Also, any major classification system revisions generally would not affect such a detailed level. So remapping data to a different structure can be greatly expedited if product line assignments were already done. Finally, the relevant product characteristics are defined by the product line definition and permit automated mapping of items to product lines by characteristics.

3.63 The level of publication is driven by a number of factors. First, there is the issue of weight availability. One must be able to accurately weight every publication category. Second, adequate cov-

erage is a critical concern to ensure accuracy, minimize variance, and ensure continuous publishability. Published indices, to meet user needs, must be fit for use and continuously available for extended periods of time. Third, the level of publication should meet user needs. PPI data are wanted at quite detailed levels for most major uses, including GDP deflation, contract escalation, economic analysis, and inventory valuation.

3.64 The aggregation structure employed by the classification system should meet major user needs. If a four-, three-, two-, or one-digit ISIC industry structure is used, this should meet the primary uses of the index. Alternative aggregation structures can be used if that is the best way to meet all major needs. This might include one set of indices following a hierarchic industry structure and another family of indices following a stage-of-processing structure.

E.2 International standard classification systems

3.65 This subsection presents the major international classification systems that are important to the PPI survey. Many individual country systems are adapted from these classification systems and are generally in concordance with one or more of them. These adaptations of international classifications reflect local circumstances by adding further detail or reducing detail by grouping some items. Such modifications of international reference classifications result in derived systems. Other countries

develop more fundamentally different structures but allow for cross-classification at a reasonably detailed level of aggregation in the reference standard. Such structures are referred to as related classification systems. There is much to be gained internationally by adopting existing standards and contributing to international working groups, maintaining those standards in order to update them and make them as widely applicable as possible. That should increase the degree of applicability of the standard system and reduce the need for local variations that inhibit international comparisons.

E.2.1 Production activity

International Standard Industrial Classification of All Economic Activities

3.66 The ISIC classifies producer units according to their major kind of activity, mainly on the basis of the principal class of goods produced or services rendered; that is, ISIC classifies principally by an output-type criterion. The categories of the ISIC at the most detailed level (classes) are delineated according to what is in most countries the customary combination of activities described in statistical units. The groups and divisions, the successively broader levels of classification, combine the statistical units according to the character, technology, organization, and financing of production. Wide use has been made of the ISIC, both nationally and internationally, in classifying data according to kind of economic activity.

The General Industrial Classification of Economic Activities within the European Communities

3.67 NACE is the standard industrial classification of the EU. NACE maps into the ISIC but generally adds detail where needed for classifying establishments in the EU. Specifically, NACE is identical with ISIC at the top level, represented by the letters A through Q. NACE then subdivides the ISIC A letter divisions further in mining and quarrying (C) and manufacturing (D) by using a second letter character. The ISIC second, third, and fourth levels, represented at each level by digits 0 through 9, are also used by NACE, but NACE subdivides detailed ISIC codes at the three- and four-digit levels. The NACE structure is compared with the ISIC in Table 3.1.

Table 3.1. ISIC and NACE

| ISIC, Revision 3 | NACE, Revision 1 |
|------------------|--|
| 17 sections | 17 sections |
| | 31 subsections (detail within sections C and D) |
| 60 divisions | 60 divisions |
| 159 groups | 222 groups |
| 292 classes | 503 classes |

Table 3.2. ISIC and NAICS

| ISIC, Revision 3/NACE | NAICS |
|--|---|
| A. Agriculture, hunting, and forestry | 11 Agriculture, Forestry, Fishing, and Hunting <i>except</i> 1141 Fishing |
| B. Fishing | 1141 Fishing |
| C. Mining and quarrying | 21 Mining |
| D. Manufacturing | 31–33 Manufacturing 511 Publishing industries 56292 Materials recovery facilities 811212 Computer and office machine repair and maintenance 811213 Communication equipment repair and maintenance 811219 Other electronic and precision equipment repair and maintenance 8113 Commercial and industrial equipment repair and maintenance <i>except</i> automotive |
| E. Electricity, gas, and water supply | 22 Utilities |
| F. Construction | 23 Construction |
| G. Wholesale and retail trade, repair of motor vehicles, motorcycles, and personal and household goods | 42 Wholesale trade 44–45 Retail trade 8111 Automotive repair and maintenance 811211 Consumer electronics repair and maintenance 8114 Personal and household goods repair and maintenance |
| H. Hotels and restaurants | 72 Accommodation and food services |
| I. Transport, storage, and communications | 48–49 Transportation and warehousing 513 Broadcasting and telecommunications |
| J. Financial intermediation | 52 Finance and insurance |
| K. Real estate, renting, and business activities | 514 Information services and data processing services 53 Real estate and rental and leasing 54 Professional, scientific, and technical services 55 Management of companies and enterprises 561 Administrative and support services |
| L. Public administration and defense | 92 Public administration |
| M. Education | 61 Educational services |
| N. Health and social work | 62 Health care and social assistance |
| O. Other community, social, and personal service activities | 562 Waste management and remediation services <i>except</i> 56292 Materials recovery facilities 71 Arts, entertainment, and recreation 81 Other services (<i>except</i> 92 Public administration) <i>except</i> 811 Repair and maintenance 81411 Private households |
| P. Private households with employed persons | 81411 Private households |
| Q. Extraterritorial organizations and bodies | 99 Unclassified establishments |

The North American Industrial Classification System

3.68 NAICS was developed for adoption by the members of the North American Free Trade Association (NAFTA): Canada, Mexico, and the United

States. It represents a significant departure from the existing industrial classification system in the United States, with one-to-one mappings possible for about only half of the existing four-digit codes of the outgoing Standard Industrial Classification (SIC). The number of major sectors has increased

from 10 to 20, coverage of service industries has improved, and certain detailed categories of industries have been reclassified.

3.69 Unlike the predominantly output-based criterion underlying ISIC and NACE, the NAICS system is based on a process-oriented principle. It attempts to group all establishments with like production processes, whether or not the majority of output is in the same detailed product category.

3.70 NAICS can be mapped into the ISIC, Revision 3, for 60 high-level (generally ISIC division) groupings. A rough idea of the relationship between ISIC and NAICS at the ISIC section level is shown in Table 3.2 (on preceding page), which was derived from published sources.³ It is evident from the variety of NAICS codes included in the ISIC/NACE sections in this table that NAICS has a rather different structure at the top level compared with ISIC, Revision 3, and NACE. Thus, while NACE is an elaboration and slight reorganization (within mining and manufacturing) of ISIC, NAICS is a substantive, if mappable, reorganization of ISIC. The two regional systems thus represent contrasting approaches to providing international comparability of national data.

3.71 NAICS does not adhere as closely as NACE to the international ISIC standard and is not as uniform across the member states of NAFTA as NACE is across the EU. On the other hand, it is a very modern system in the prominence and detail given to information and other service activities.

Australian and New Zealand Standard Industrial Classification

3.72 The ANZSIC was developed between the Australian Bureau of Statistics (ABS) and New Zealand Department of Statistics for use in the collection and publication of statistics in both countries. It is related to the ISIC in concept and contains a hierarchical structure of divisions (17), subdivisions (53), groups (158), and classes (465). The ABS has developed a concordance between ANZSIC and ISIC, Revision 3.

³A detailed concordance between NAICS and ISIC, Revision 3, is still in preparation by the NAICS working party.

E.2.2 Product classification

Central Product Classification

3.73 The CPC extends the Harmonized Commodity Description and Coding System (HS) used in the classification of traded goods to cover services and nontraded goods. It is designed to correlate to some extent with the ISIC, which, in turn, is based on the type of product a producer unit or establishment principally produces. It is, therefore, integrated with both of these international standards.

3.74 Specifically, the CPC coding system consists of five digits indicating 9 sections, 70 divisions, 305 groups, 1,167 classes, and 2,092 subclasses. Each of the 2,092 subclasses is an aggregate of one or more headings or subheadings of the HS. Integration with ISIC, Revision 3, has been brought about to some extent by grouping CPC subclasses according to the ISIC activities for which they are the principal products. In general, each five-digit subclass of the CPC consists of goods and services that are predominantly produced in one specific four-digit class or classes of ISIC, Revision 3.

3.75 However, since CPC is a product classification, it cannot be used to uniquely identify the industry of a product's origin: a given detailed CPC code may identify products originating from establishments classified in different ISIC activity categories. However, identification of product type by originating activity would be possible in principle merely by recording both the ISIC and CPC codes for each product record collected in the business surveys providing source data.

Eurostat Classification of Products by Activity (CPA and PRODCOM)

3.76 The CPA is designed to correlate with, and thus derives from, NACE, the EU specialization of ISIC. The motivation for developing CPA is that the CPC is not sufficiently detailed to be the single central product classification system for a comprehensive system of economic statistics, and that European users of the product classification preferred that it be derived from the industrial activity system. For coding of industrial statistics, CPA has been specialized in the PRODCOM product coding system, either by adding detail to CPA or aggregating some of its components, following the rule that

no PRODCOM aggregation violate a broader CPA grouping.

3.77 As noted above, the desire for identification of product type and originating activity on the same product record could also be achieved by entering both the ISIC (NACE) and CPC codes, rather than creating a new (CPA or PRODCOM) product code. The latter may reduce the number of coding characters and thus database size, and could simplify staff training and coding operations to some extent. However, these conveniences are purchased at the expense of precisely what CPC has been designed to provide, which is the ability to group first on the basis of physical and intrinsic product characteristics rather than originating activity.

North American Product Class System

3.78 There is no product classification correlating with the NAICS activity structure, and there is, as yet, none planned. A new North American product classification system is under development, driven generally by a market- or demand-based grouping principle rather than a process-grouping principle. By implication, the new product system

to be developed for the NAFTA countries can be expected to be distinct from the NAICS, more fundamentally than the CPC is distinct from the ISIC. Under distinct industry and product coding systems, there is less homogeneity required of individual producer units within the same activity in the sense of having very similar detailed products and being very specialized in the production of those products. Further, the activity classification of a given establishment may well be more stable, though of course subject to change as the establishment adopts or significantly revises its production process.

3.79 Like the CPC, the prospective North American product classification would provide data on product by activity, when desired, by requiring both NAICS and product codes on each product record collected in the industry surveys supplying source data for the national accounts and other economic statistics. In view of the existing CPC, which is based on the now almost universally adopted HS product coding system for internationally traded items, it can be hoped that the North American system will strongly resemble the CPC or be mappable to it at a detailed level.

