GROSS REGIONAL PRODUCTS: CONCEPTS AND COUNTRY PRACTICES

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This document is written as training materials for the compilation of Gross Regional Product (GRP). The document is a summary of the papers presented at the Workshop on Regional Products and Income Accounts held in Beijing, China between 15 and 19 March 2010. The first part discusses the methodology for Gross Regional Product., which also includes the conclusions reached at the Workshop on a number of questions raised for discussions by the participants. The second part summarizes the country practices that were presented at the Workshop.

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Introduction

1. This document is written as training materials for the compilation of Gross Regional Product (GRP). The document is a summary of the papers presented at the *Workshop on Regional Products and Income Accounts* held in Beijing, China between 15 and 19 March 2010. The Workshop was sponsored by China's National Bureau of Statistics and the United Nations Statistics Division (UNSD) as part of the project *Statistical Capacity Development in China and other Developing Countries in Asia.*

2. The first part discusses the conceptual foundation for GRP and the summary of the conclusions reached at the Workshop on a number of questions raised for discussions by the participants. The second part summarizes the country practices that were presented at the Workshop.

3. The workshop was participated by senior statisticians from 15 countries and thus presented with the practices in GRP compilation by a wide-ranging number of countries from all over the world, including Australia, Brazil, Cambodia, Canada, China, India, Indonesia, Laos, Malaysia, Mongolia, the Philippines, Thailand, United Arab Emirates and Vietnam. Some participating countries have not compiled GRP but most of them have. The Workshop had also the participation of statisticians from the National Bureau of Statistics and from all provinces / municipalities in China which have compiled not only provincial/municipality GRP but also GRP of lower prefecture level. As a consequence, the presentations have provided diverse, rich and useful lessons for the participating countries to learn from one another.

4. This document is prepared and published so that other countries which did not participate can also learn from the experiences of the Workshop's participants. The discussions at the Workshop on a number of important but difficult issues in the compilation of GRPs and the resulting conclusions reached are included in this document so that they may provide useful references for adoption or for further deliberation.

5. Although the Statistical Office of the European Union (EUROSTAT), has published *Regional Accounts Methods: Gross Value Added and Gross Fixed Capital Formation by activity (1995)* as general guidelines for gross regional accounts, still more need to be done to improve it with the expectation to contribute to international standards on gross regional products, which is not yet available.

6. This document is written by Vu Quang Viet as a consultant to the UNSD. He is grateful to the UNSD for providing him with this opportunity and to Youlia Antonova for providing very useful comments on the first draft.

Part I

METHODOLOGY ON GROSS REGIONAL PRODUCTS

Chapter 1. Gross regional product (GRP): a conceptual introduction

I. INTRODUCTION

1.1 Gross regional product (GRP) is conceptually equivalent to gross domestic product (GDP); the latter measures newly created value through production by resident production units (or residents in short) in the domestic economy, while the former measures newly created value through production by regional production units (or regional residents in short) in the regional economy, be it a state, province or a district.

1.2 Thus GRP in principle can be measured by three approaches: the production approach, the final expenditure approach and the income approach.

1.3 **The production approach** requires data on output produced by regional residents and data on intermediate consumption by them; from these data, value added is derived as the difference between output and intermediate consumption. For example, value added of agriculture in table 1 is derived as 100 less 15 (=5+10). The sum of value added generated by these regional residents is equal to GRP. The production is possible as long as regional residents are well defined such that data on them can be collected.

1.4 **The final expenditure approach** requires data on final consumption and gross capital formation of regional residents (both households and government), and their exports and imports. Data on exports to both other regions and abroad and imports from them is very expensive to the point of impossibility to collect. This approach is, as a consequence, impractical. However, if data is available, GRP is equal to 285 (=50+75+110+50)

1.5 **The income approach** in a way is similar to the production approach, although data on components of value added is to be collected. Components of value added can only be collected for the corporations and the government sectors where distinction between compensation of employees (COE), consumption of fixed capital and net operating surplus (NOS) is made. For the household unincorporated enterprises, where it is not possible to distinguish between COE and OS, mixed income that combines COE and NOS is an alternative. In the example of table 1, GRP = 285 (=1+5+70+100+10+50+4+45). It should be noted that generally data on components of value added is not as readily available, particularly consumption of fixed capital and net operating surplus. Consumption of fixed capital must be mathematically calculated given a time series of gross capital formation in the industry, price indexes of capital goods, types of capital goods and their useful lives and assumption on deterioration in capital assets. Net operating surplus can be calculated for the enterprise but must then be allocated to the establishments that are parts of the enterprise. The income approach is quite difficult to implement at the regional

level. For non-market activities the income approach is easier to implement as net operating surplus is in principle zero.

1.6 Table 1 shows GRP in three approaches. In case that value added coefficients for the benchmark year are available, value added at constant prices may be estimated by multiplying the value added coefficients of the benchmark year with the output of the current period (deflated to the prices of the benchmark year). Table 1 also shows that net exports (exports less imports) can be derived if other components of final expenditure are available. Again, value added here are at basic prices, therefore taxes on products must also be allocated to a region to obtain its GDP.

Table 1. Illustration of production approach to GRP

	Agriculture	Manufacturing/ services	Exports less imports	Final consumption	Gross capital formation	Total output
Agriculture	5	20	0	75		100
Manufacturing/services	10	80	50	110	50	300
Value added at basic prices	**85**	**200**				
Other taxes less subsidies on production	1	5				
Compensation of employees	70	100				
Consumption of fixed capital	10	50				
Net operating surplus	4	45				
Output at basic prices	**100**	**300**				
Value added ratios	0.850	0.667				

II. MAIN ISSUES WITH GROSS REGIONAL PRODUCT (GRP)

1.7 To compile GRP for a region, it is necessary to collect data on residents of the region. There are two types of regional units:

a) Uniregional units that operate exclusively within one region, and
b) Multiregional units that operate at the same time in many regions.

1.8 Among uniregional units are households, corporations whose local units are all located in the same region, local and state governments, at least part of social security and many NPIs serving households. Regarding households, similarly to the concept of residents in the national economy, the centre of economic interest is the region where they live, not the region where they work.

1.9 Since the production approach is the main and possibly the only approach to the compilation of GRP, the focus of this chapter is on the definition and identification of resident production units. However, the SNA 2008 provides neither a definition of a regional economy

nor the standards for compiling GRP. In order to help compile gross regional product (GDP), it is necessary to resolve the following issues:

a) What is a regional resident?
b) How ancillary units producing services for own consumption within an enterprise at geographical locations other than that of the parent enterprise be treated?
c) How should one regionalize the production of a national corporation that operates at many geographical regions even without an office?

THE CONCEPT OF REGIONAL RESIDENTS AND SUPRA-REGIONAL UNITS

1.10 Although the SNA 2008 provides neither a definition of a regional economy nor the standards for compiling GRP, it is possible to extend the concept of residents of the national economy to the context of a regional economy. **A resident of a regional economy must have a centre of predominant economic interest in the economic territory of a region**. As long as it satisfies the definition mentioned above, a resident of a regional economy needs not be in the territory of the region (an individual may work in one region but live in another region). To have a centre of predominant economic interest in the economic territory, a resident unit, be it a production unit or a consuming unit must engage and intend to continue engaging, either indefinitely or for at least a year long period of time, in economic activities and transactions on a significant scale.

Table 2. Comparison between residents of national and regional economy

National economy	**Regional economy**
▸ **Residents of the national economy:** must have a centre of predominant economic interest in the national economy. ▸ **Extra-territorial organizations:** Residents outside of national territory have the national economy as the predominant centre of economic interest. ▸ **Multi-national enterprises:** Even not having a branch but have operating location or payment of taxes to the country, a segment of it will be allocated to the country.	▸ **Residents of a regional economy:** must have a centre of predominant economic interest in the economic territory of the region. ▸ **Residents of supra-regional territory:** Residents have only the national economy as the centre of predominant economic interest; not tied to any particular region. ▸ **Multi-establishment enterprises with registered local units:** • Local units in the region will be recognized as establishments. ▸ **National industries that operate at many regions** (railroad, highway, electricity, …): • Production will be allocated to the regions

1.11 One problem with a regional economy is that some production units have only the centre of predominant economic interest in the nation as a whole. These units have no economic ties with any regional economy, they are under the effective economic control of the national government with respect to ownership, the right to operate and exploit, and the right to tax, and royalty payment, etc.

Key features on centre of predominant economic interest defined by SNA2008 (para.5.10-5.15):

a) Effective economic control of a single government in terms of rights to use (land area, airspace, territorial waters) and to exploit (fishing, fuels, minerals).
b) Government authority is reflected in registration, license, lease requirement, tax payment, royalty payment.
c) Existence of a location, dwelling, place of production where production activity takes place for a finite but significantly long period of time (1 year or over)

1.12 **For the units that have no economic interest in any particular region, which empirically means that they generate little employment and contribute negligible income to the regions they are located, it is recommended that they should be treated as supra-regional economies, which are conceptually similar to the extra-territorial organizations in the national economy. In other words, these units do not belong to any region and as a consequence of this treatment, GDP of the national economy is equal to GRP of all regions plus GRP of the supra-region.** Similarly to extra-territorial organizations they may employ some residents of some regions, the payment of compensation of employees (COE) may be treated in the same manner as COE from the rest of the world.

Table 5. Comparison between extra-territorial organizations and supra-regional units

Extra-territory/extra-territorial organizations	**Supra-regional territory/ supra-regional units**
a) National air-space, territorial waters and the continental shelf lying in international waters over which the country enjoys exclusive rights; b) Territorial enclaves {i.e. geographic territories situated in the rest of the world and used, under international treaties or agreements between States, by general government agencies of the country (embassies, consulates, military bases, scientific bases etc.)}; c) Deposits of oil, natural gas etc. in international waters, outside the continental shelf of the country, worked by resident units.	Similar categories (particularly 1 and 2) can be defined for supra-regional territory, which include those that do not attach to any particular region. a) National air-space, territorial waters and the continental shelf lying in supra-regional territory over which only the national government enjoys exclusive rights and authority; b) Deposits of oil, natural gas etc. in over which the national government has exclusive rights and authorities, which may be worked by resident units of any region.

1.13 Examples of supra-regional units in a national economy are clearly resident units located abroad such as embassies or military bases. It may be an oil field owned by the national government, and off-shore national resources controlled by the national government. It might be dams owned by the national economy to produce electricity for sale abroad. These units are either outside the territory of any region or generate minimum employment to the regional economy where they are located and that most of value added is with the control of the national government. If the value added is allocated to the region where supra-regional units operate, actual per-capita GRP of the region may be completely distorted and if value added from these units is significant, rates of regional economic growth are also distorted. It is possible to correct for the distortion by the income concept instead of GRP concept, so that income flowing out of the regions will be deducted and income flowing in will be added. However, this compilation of regional income may be too demanding in terms of data requirement. Military bases located in a region should be treated as regional units when they generate significant employment and business to the local economy. In case that data on the military activity is not obtainable at the regional level, it can be treated as a supra-regional unit.

III. TREATING ANCILLARY LOCAL UNITS AS ESTABLISHMENTS

1.14 The SNA 2008 still defines establishment, which is a basic production resident unit, as "***an enterprise, or part of an enterprise, that is situated in a single location and in which only a single productive activity is carried out or in which the principal productive activity accounts for most of the value added.***" (SNA 2008, para. 5.15).

1.15 However, in comparison to the SNA 1993, the SNA 2008 has changed the definition of an establishment to such an extent that it is possible to define local units as establishments even though these local units have no sale to other enterprises and provide mainly supporting services to other units within the same enterprise but are located in other geographical regions. This change in definition would allow for the collection of production data of local units.

1.16 Local units, which produce for own use within the enterprises, are called by the SNA ancillary units. These ancillary units that produce supporting services such as head office, purchasing, sale, warehousing, accounting, cleaning, transportation, etc. will generally not be considered establishments by the SNA as long as they and other establishments of the enterprise operate within the same location. However, if the ancillary units operate outside the geographical regions where other establishments of the enterprises operate, they should be treated as establishments with output imputed by production costs. This exception is, for the sake of compiling GRP, ***"if it is in a geographically different location from the establishments it serves, it may be desirable and useful to consider it as a separate unit and allocate it to the industrial classification corresponding to its principal activity."*** (SNA 2008, para. 5.58).

1.17 Ancillary establishments do not engage in production for the market and therefore have no sales; their output must be indirectly measured at costs, which is the sum of intermediate consumption, compensation of employees, consumption of fixed capital and other taxes on production. (The appendix will discuss on how to allocate their output that is supplied as intermediate consumption to other establishments within the same enterprise. This issue should be an important concern of statisticians responsible for data collection).

1.18 Thus, it is imperative that a new method of data collection be introduced such that local ancillary units, when necessary, i.e. when they are located at the geographical regions different from the regions where the enterprise is located, can be identified as establishments and the data on their output can be collected.

IV. TREATMENT OF NATIONAL CORPORATIONS

1.19 Many national corporations are multiregional in nature since they are operating in many regions of the country. These corporations are different in nature from ancillary units discussed previously, as its production of goods and services for sale occur in many regions of the country. They may have establishments (or branches in the business sense) which have full cost and sale accounting in various locations in that case they can be easily distinguished and treated as establishments as in the case of ancillary units. However, in many cases they may serve as

fee/sale collection centers or simply as operating service or maintenance offices. The following cases are typical in any economy:

a) A construction company which is headquartered in one location but has short-term construction projects or building sites in other regions;
b) An electric company that provides services to many regions;
c) A land transport corporation that has depots at different regions;
d) A pipeline that is exploited/utilized by many locations;
e) Rail and air transport companies that serve many locations;
f) A telecommunication corporation which is managed at one location but with telephone line, telephone boxes and sets at many locations;
g) Financial intermediation corporations (such as banks, financial corporations, pension, insurance companies);
h) A postal service that serves all regions;
i) Activities of national government at the regional level.

1.20 The production of a multiregional corporation can be regionalized in line with the SNA recommendation of treating multi-national corporations, i.e. output or value added should be prorated according to an appropriate indicator. This is clearly a top-down approach.

> *A few enterprises operate as a seamless operation over more than one economic territory, typically for cross-border activities such as airlines, shipping lines, hydroelectric schemes on border rivers, pipelines, bridges, tunnels and undersea cables. If possible, separate branches should be identified, but if the entity is run as a single operation with no separate accounts or decision-making for each territory that it operates in, it is not possible to delineate branches. In such cases, because of the central focus on data for each national economy, it is necessary to split the operations between economies. The operations should be prorated according to an appropriate enterprise-specific indicator of the proportions of operations in each territory. The prorating treatment may also be adopted for enterprises in zones subject to joint administration by two or more governments (SNA 2008, para. 26.55).*

1.21 The following solutions may be applied to the cases mentioned in para. 1.20.

Table 5. Guides to allocation of value added

Economic activity	Guide for allocation of value added
a) A construction company is headquartered in one location but has construction projects or building sites in other regions.	Value added of the national corporation when it is significant should be allocated to the region. Employment or working hours may be used as indicator. In the absence of information, gross capital formation is allocated to the headquarter.
b) A land transport corporations has depots at different regions	Value added may be allocated by the cost of operations of the depots or share of employment there. Gross capital

Economic activity	Guide for allocation of value added
	formation includes what is expensed there.
c) A pipeline is exploited/utilized by many locations	Value added may be allocated by the employment at the locations. Gross capital formation includes what is expensed there. The rest of gross capital formation of the corporation is allocated to the headquarter.
d) Rail and air transport companies that serve many locations	COE is allocated to the region where employment takes place. Other components of value added are allocated by the share of employment of the company at the location. Gross capital formation includes what is expensed there. The rest of gross capital formation of the corporation is allocated to the headquarter.
e) A communication corporation which is managed at one or a few locations, but with telephone line, telephone boxes and sets at many locations	Value added is allocated only to the locations that manage it, not where the equipments are placed. Gross capital formation is similarly treated. Repair may be allocated to where there exist sites that repair the lines.
f) Financial intermediation corporations (such as banks, financial corporations, pension, insurance companies)	Allocation of fisim to industries may be allocated to a region by the shares of total loans and total deposits in the region. If these data are not available they may be allocated by regional shares of COE in the financial intermediation corporations. COE of financial intermediation should be allocated to places where they are employed. Operating surplus may be allocated by the share of total loans and deposits of a region.
g) A postal service that serves all regions	COE and gross capital formation are allocated to places where they are employed. Operating surplus may be allocated by the shares of volumes of mail.
h) Activities of national government at the regional level	COE and gross capital formation are allocated to places where they are employed.

V. Treatment of informal activities

1.22 One of the most difficult areas in national accounting, particularly in developing countries, is the measurement of the production activities of the household sector. Not only that the sector needs to be measured exhaustively but also its rates of growth must be measured properly. The latter cannot be compromised for the former; on the contrary the latter may be more important when economic growth is the focus of an analysis. This is one of the reasons why in most countries, a base year for which full information is available, needs to be established (either for a number of activities or for the whole economy) and then extrapolated by using the data that are collected quarterly or annually until a new base is established to replace the old one. Even for countries where full information is collected annually, it takes time to process the data before new information can be used; thus during the interim information of the old base year continues to be used.

1.23 For production activities, two types of households can be distinguished. **Households as unincorporated enterprises with market production (HUEMs)** and **Households as producers for own final consumption (NON-HUEMs).**

1.24 Most households as producers for own final consumption involve in agricultural production. In addition to agricultural output, there are some other incidental production for own final use or for sale, whether in rural or urban areas, such as making clothes or preserved food. These households are called NON-HUEMs. Agriculture output and value added for the whole economy and by regions may be measured by cross-cutting methods and data on land use. Incidental production may be small and can only be measured through household income and expenditure survey or most of the time simply estimated by equating supply and demand by commodity.

1.25 **Households as unincorporated enterprises with market production (HUEMs) must have entrepreneurial spirit in the sense that they try to pursue production for the market on a regular basis.** HUEMs do not include the unincorporated household units that only have some incidental sales.

1.26 It is not the intention of this document to describe how the informal activities can be measured. The ESCAP/ECSWA/ECLAC project with the participation of Mongolia, Sri Lanka, Palestine, the Philippines, and Saint Lucia was an attempt to measure them using the 1-2 survey method. Readers can consult the ESCAP and other documents on how to measure HUEMs. [1] However, it may be summarized as follows:

a) Data on production of commercial farmers and households involving in manufacturing and the service activities are collected for a given base-year in terms of output, value added and employment (hours worked are preferred).
b) Employment statistics on informal activities are used to extrapolate value added to current periods. Informal employment is derived as the difference between the employment collected in the labour force survey and the employment collected through enterprise survey. The labour force survey is the household based survey which is supposed to capture all household employment. Enterprise survey captured only employment in production units that are registered with the government and

[1] See *Unified Data Collection Strategy for Measuring the Informal Sector and Informal Employment (UDCS-ISIE)* prepared by Pietro Gennari, Margarita F. Guerrero, Zeynep Orhun of the UNESCAP Statistics Division and Gulab Singh of the United Nations Statistics Division (UNSD), October 2008. See also the Vu Quang Viet report written for ESCAP, *Compilation of output and gross value added* or Vu Quang Viet, *GDP by production approach: A general introduction with emphasis on an integrated economic data collection framework* prepared for the China-funded UNSD's project *Statistical Capacity Development in China and other Developing Countries in Asia.*

have addressed at fixed location and therefore are subject to regular sampling surveys.

c) In case there is a lack of regular surveys on the informal activities, data on very small enterprises units can be used for approximation. At the base year for which data on the informal activities are available, productivity adjustment ratios between small enterprises and the informal units are derived. These ratios can be used for the following periods until data on value added of the informal activities are available.
d) The informal activities must also be measured at the regional level if GRP is to be compiled. Thus the sample used only for the household survey at the national level must be designed to reflect the regional levels. This is a complicated and expensive task for any national statistical office. In developing countries, value added of the informal activities at the regional level particularly in poor regions may make up a significant share of GRP (more than 50% is not unthinkable) therefore appropriate methods need to be develop so that their contribution to GRPs can be measured reliably over time.

VII. Treatment of taxes on production and subsidies

1.27 Other taxes on production and other subsidies on production should clearly be allocated to the regional establishments that pay or receive the taxes to the regional government as part of their operating costs.

1.28 At the national level, taxes on production and subsidies are normally paid/received by the purchasers (either producers or final consumers) and they are added to the sum of value added at basic prices to obtain national GDP. At the regional level, the allocation is more complex. Taxes may be added to the sum of regional value added as in the case of GDP, but the question is how these taxes should be allocated to the regions. Should they be allocated on the basis of where the products are produced or where the products are consumed?

1.29 Many countries allocate taxes on production and subsidies to where products are produced. Canada, however, allocates taxes to the regions where products are consumed because Statistics Canada are required to provide statistics to help the federal government to allocate their taxes as the Canadian legislation requires that:

- Value added tax is collected by federal government on behalf of provinces, and allocated to those provinces on the basis of regional economic accounts expenditure estimates;
- Federal transfer payments allocated to provincial governments is also based on regional accounts data.

1.30 With either allocation alternatives, taxes and subsidies may distort the valuation of regional production results which can be better measured at basic prices. Thus exists another alternative treatment: taxes less subsidies should not be allocated to any regional economy. GDP as a consequence will be equal to the sum of regional GRPs at basic prices + taxes less subsidies on products.

VIII. Compilation methods: top-down versus bottom-up

1.31 **Mixed method**: As discussed in the previous paragraphs, the compilation of GRP should rely as much as possible on the data that are collected on regional production units, however, there are national units that operate across many regions and thus the allocation of national data to regions using indicators is unavoidable. The compilation of GRP, as a consequence, has to rely on mixed compilation method that utilizes both the bottom-up and top-down methods. For activities that are purely local, the bottom-up method assures that the value added for these activities reflect the actual production of regional economy. This would require statisticians to collect data on purely regional units. The top-down methods applies only to the activities that operate across many regions on which regional data that are available do not fully reflect their activities in the region. The mixed method is reflected in *Regional Accounts Methods: Gross Value Added and Gross Fixed Capital Formation by activity (1995)* prepared by the Statistical Office of the European Union (EUROSTAT). The EU method does not discuss how current values are deflated and whether regional price indexes or national price indexes should be used. New Zealand, China, Indonesia, Vietnam use this method.

1.32 **Pure top-down method**: The pure top-down method is applied in a number of countries (for example USA, Germany and the Netherlands), where national value added by industries are allocated to regions on the basis of some indicators such as compensation of employees (which already makes up at least 60% of actual GRP). The latter reflects better productivity as more productive labour tends to earn more incomes and generate more value added in the same line of industry. This method normally does not reflect fully differences in productivity but avoids the problem of adding-up data from regions to the national totals at both current and constant prices. However, it does not reflect fully actual transactions.

IX. Institutional arrangement: centralization versus decentralization

1.33 There is a choice with respect to the institution that is assigned the responsibility for compiling GRP in a country. GRP can be compiled either by the national statistical office or by regional statistical offices.

1.34 The reason for regional statistical offices to take up the role of compilation is the demand of regional authorities for statistical information to serve their planning activities, particularly in countries where the economic role of governments and state ownership of enterprises are paramount. Given the data requirement, it is not possible for a regional government to compile GRP on its own, as it does not have information on the activities of the national corporations that would generate value added to the regions. As has been pointed out, national industries may operate across many regions. Government institutions particularly the military may operate in the regions over which regional authorities may not be able to collect information. Given that regional statistical offices assume themselves the responsibility to compile their own GRPs, it is necessary to set up a assistance/verification mechanism, for example:

a) Value added of national industries are allocated by NSO and provided to regional statistical offices.
b) Value added for each activity at regional levels should be sent upward to NSO for adding-up checking and for the allocation of minor differences between the national total and the sum of regional data.
c) Finally, regional statistical offices may provide quick and preliminary estimates but the final GRP must be issued by NSO in order to assure quality and credibility of statistical works in a country.

1.35 In general, centralization approach, i.e. to have the national statistical office (NSO) responsible for the GRP compilation is the best approach. There are many advantages of doing so:

a) First, the concepts underlying data at the national level and regional levels, by activity and at the aggregate level, can be easily made fully consistent;
b) Second, data at the regional levels are guaranteed to add up to the national totals. Totaling up by activity is a requirement not only for GDP in current prices but also in constant prices.
c) Third, data on national industries can be properly allocated to the regional economies only by NSO given its knowledge on the national economies and its capability for selecting and collecting of appropriate indicators for the purpose of allocation (the top-down approach).
d) Fourth, the manpower devoted to GRP compilation will be greatly reduced. Manpower at a regional statistical office required to compile GRP would be not much less than that at the NSO level assuming a given level of quality is to be reached.

1.36 Given that GRP is compiled by provincial governments, NSO would need to provide to each region the regionalized value added of the national corporations and activities. This does not seem to be the best approach unless data on uni-regional units are collected with the same systematic and consistent sampling method that meets the need of both national statistical system and provincial statistical system. Brazil has implemented this decentralized system with an innovative feature. In Brazil, GRPs are compiled locally but in order to have a full supervision of consistency in data, NSO of Brazil controls the compilation of GRPs as follows:

a) Have focal points in the regions as GRPs in Brazil may also be compiled by non-statistical agencies.
b) Set up the central database where both national and regional data are stored in a systematic manner that allows checking and confrontation of data such as the sum of local data does not add up to the national data. Discussion between central NSO and local offices is organized to resolve inconsistency. Small and independent regional databases are not efficient and cannot be independently verified as it is a part of the national system. (See a prototype below for illustration only such that data at the regions can be checked to see if they add up to the total economy and whether value added ratios are reasonable).
c) Control methodological consistency.

Table 5. A centralized database

	Region 1				Region 1			Total economy		
Industry 1	Output	IC	VA	……	Output	IC	VA	Output	IC	VA
Industry 2										
….										
Industry n										

X. Deflating GRP

1.37 In principle, regional value added by industries that make up GRP should be deflated by regional industry prices, however, the implementation of this principle would require much more information than currently available in most countries. One needs not only regional producer prices indexes, regional consumer price indexes but also regional price indexes for producer goods. In addition, the discrepancy between regional GRPs and national GDP may be more exaggerated as the weights are not created on the basis of a fully integrated system of data collection reflecting both the national and regional economies.

1.38 EUROSTAT does not provide explicit recommendations on the deflation of GRP. Most countries including many countries that are represented in the Beijing Workshop on 15-19 March 2010 are using national price indexes for deflation purposes. This is not a perfect solution, however it is acceptable provided that prices of a given commodity vary throughout the country similarly or if different, the difference is negligible. In Australia, regional price indexes which are cost-based are applied only to construction.

1.39 Conceptually, however, even if the price of a given commodity varies similarly throughout the country; price indexes at the more aggregate commodity level may vary greatly depending on the weights and the price movement of each detailed commodity that makes up the weights. For example, grain may be consisted of main stuffs such as rice and wheat, and their prices may vary in opposite direction depending on the weather. In such a case price index of grain may vary greatly across regions depending on the composition of produced grain output in each region.

1.40 Again if regional price indexes are used, the consistency and the problem of "adding-up to the national totals" can be much easily solved at the NSO level.

XI. GRP and regional income

1.41 GRP similar to GDP measures the income generated through production in a region. On the one hand, this income is then transferred to the government as taxes and to owners of factors of production (such as owners of capital and labour) and to relatives in other regions and abroad. On the other hand, households in the regions received transfers from the government and relatives in other regions and abroad. It would be important to measure regional household income. This would require the collection of data on property income and current transfers receivable and payable. It may not be possible to capture all data on transfers but major transfers

when captured would provide important information on net income and thus broad understanding of regional per capita income and poverty.

XII. Extrapolation to obtain more timely GRPs

1.42 Similar to national GDP, more up-to-date GRPs can be estimated by extrapolating from benchmark GRPs by using indicators. These indicators can be quantity or volume that tracks the performance of each industry at the regional level. They can also be indicators that are values in current prices but deflated to the values of the benchmark year as long as these indicators track well the performance of the industry that needs to be extrapolated. Quarterly GRPs thus can be obtained by extrapolation. Finally, similar to national GDP, these preliminary GRPs can be revised and recalibrated to add up to more reliable annual GRPs.

APPENDIX ON REGIONAL STATISCIAL UNITS

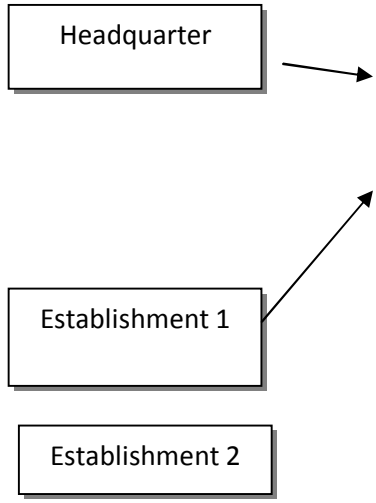
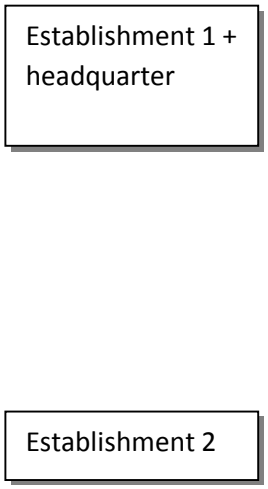
1.43 To serve the purpose of compiling regional GRP, local units of corporations, even if they are ancillary units that produce services for internal uses by units within the enterprise, should be treated as establishments. Figure 1 shows the new treatment recommended in SNA 2008. Output of local units, for instance the headquarter unit, can be calculated by costs. This output is then imputed as intermediate consumption of other establishments in the enterprise by their shares of output or employment.

1.44 To properly collect production data for local ancillary units, data collectors must be able to identify the enterprise and their off-spring establishments as well as ancillary establishments that provide them with services. Since these services are not sold, but internally used, they must be allocated by some indicators that use them. The most appropriate indicator is share of value added, but if it is not available, share of output and employment can be used. **However the most important requirement for this process of allocation by data collectors is that the link by a coding system between the enterprise and off-spring establishments must be established. This linking system is required only if these units are situated in different geographical locations for which GRP must be compiled.**

Figure 1. Establishments in corporations: a scheme of imputation

<table>
<tr>
<td>A given corporation that has two establishments producing good for sale and a headquarter providing services to their establishments without charges (see below)</td>
<td>Old treatment

(all costs of headquarter are distributed to main establishment (1)</td>
<td>New treatment

(Distribution of headquarter output as Intermediate consumption (IC) to all other establishments)</td>
</tr>
<tr>
<td> 
</td>
<td> 
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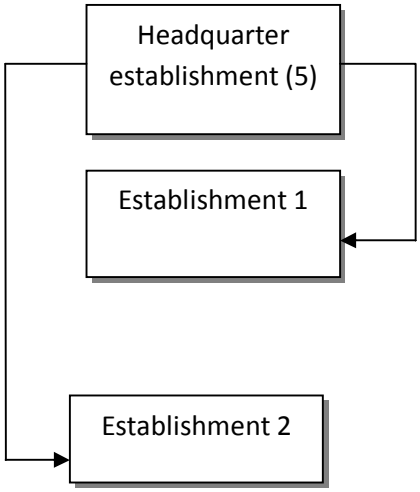
<td> 
</td>
</tr>
<tr>
<td>Data

<table>
<tr><th>Establ. 1</th><th>Establ. 2</th><th>Headquarter</th></tr>
<tr><td>Output: 200
IC: 100
VA = 100</td><td>Output: 100
IC: 30
VA = 70</td><td>No sale/revenues
IC: 30
VA: 15</td></tr>
</table></td>
<td>Old treatment

<table>
<tr><th>Establ. 1</th><th>Establ. 2</th></tr>
<tr><td>Output: 200
IC: 100 + 30
VA = 70</td><td>Output: 100
IC: 30
VA = 70</td></tr>
</table>
GDP = 140</td>
<td>New treatment

<table>
<tr><th>Establ. 1</th><th>Establ. 2</th><th>HQ est. 3</th></tr>
<tr><td>Output: 200
IC: 100+30
VA = 70</td><td>Output: 100
IC: 30+15
VA = 55</td><td>Imputed output:45
IC: 30
VA= 15</td></tr>
</table>
GDP = 140 (same as old treatment)

With 3 establishments in 3 locations</td>
</tr>
</table>

Chapter 2. Conclusions of the Beijing Workshop on Compilation of Gross Regional Products

2.1 This chapter provides a summary and conclusions of the Workshop on Regional Products and Income Accounts held in Beijing, China between 15 and 19 March 2010. After country presentation, the workshop devoted a full day to discuss a number of important questions relating to the compilation of gross regional products.

Institutional arrangements: Should GRP be compiled by regional offices or the central statistical office?

2.2 **Canada** – Some issues cannot be resolved by regional offices, for example multi-regional enterprises or central government activities that operate throughout the country. NSO may approach these enterprises and collect data for the enterprise and its establishments and regionalize ancillary activities to local establishments. In addition, central government activities may be allocated to the regions on the basis of the sum of compensation of employees and consumption of fixed capital.

2.3 **Brazil** – Though in Brazil, GRPs are compiled locally but to have a full supervision of consistency in data, NSO of Brazil controls the compilation of GRPs as follows:

1. Have focal points in the regions as GRPs in Brazil may also be compiled by non-statistical agencies.
2. Set up the central database where both national and regional data are stored in a systematic manner that allows checking and confrontation of data such as the sum of local data does not add up to the national data. Discussion between central NSO and local offices is organized to resolve inconsistency. Small and independent regional databases are not efficient and cannot be independently verified as it is a part of the national system.
3. Control methodological consistency.

2.4 **Australia** – NSO should ensure consistent methodology, transparent compilation process and numerical consistency.

2.5 Regional GDP data should be controlled and signed off to be official. NSO should decide on standards and methods. Data should be produced properly by all agencies in the National Statistical System.

2.6 ***Conclusion: It is recommended that GRPs be preferably compiled by the Central National Statistical Office. The Central National Statistical Office should have the ultimate responsibility for***

compiling and disseminating regional GDP and ensuring that the statistics are reliable and regional data add up to the national total.

Three approaches to GRP compilation: should all three approaches be applied?

2.7 **China** – In China, a mixture between income and output approaches for different activities is used, depending on data sources available, the question is which approach can be considered the leading one for GRPs?.

2.8 **Viet Vu**: GRP is compiled by the production approach in many countries. In countries where enterprise statistics are available, the income approach is often used. For enterprises, when turnover and sales data, intermediate costs, profits and other relevant costs and incomes are available, the production approach (also called output approach) should provide the same value as the income approach. In principle, for enterprises, gross operating surplus can be compiled from business profit (or net income before taxes) of the enterprise after some adjustments. The adjustments includes: (1) deducting from profit other incomes (such as interest and dividends receivable, insurance claims, capital gains realized, etc.) that are considered property income, current transfers or holding gains in the SNA, and (2) adding in items that should not be regarded as intermediate costs in the SNA (such as interest payable, insurance premiums, bad debt allowance, etc.). In this sense, China was correct to comment that the income approach was better, because in majority of cases information about the intermediate consumption is missing. However, this practice is reliable only for GDP at the national level. At the regional level, the method does not work properly because of the fact that the financial statements of enterprises that operate in more than one regional economy include data on more than one region. Proper collection of data requires the identification of establishments (i.e. part of the enterprise) operating at every region. Thus the proper statistical units for regional statistics are establishments, not enterprises. In addition, value added of informal activities cannot be easily compiled by the income approach.

2.9 **Australia** – The application of 2 or 3 methods for measuring GRP are better than a single one in order to have a confrontation between different values. Usually one of the approaches is stronger than the others, at the same time; each of the three has its own weaknesses.

2.10 **Philippines** – While deciding on the approaches one should take into account the needs of users. Some of the expenditure components are difficult to regionalize; however, countries should continue to develop the remaining items by regions. The Philippines strongly supports the 3 approaches to GRP. Short term and long term plans should be developed with the recognition of some components' constraints, for example the difficulty in compiling regional exports and imports, but it is useful to elaborate foreign trade from the regions.

2.11 **Viet Vu** – It is worthwhile to emphasize that the income approach may not be implementable for the informal sector (which makes up a significant share of GDP in the developing countries, particularly at some poor regions). For the informal sector (or activities), the best approach is the production approach.

2.12 ***Conclusion: The workshop strongly supports that the GRP be estimated by the 3 approaches, with the production approach (also called the output approach) as the leading one. Whenever possible, countries are encouraged to regionalize some components of the final expenditure (GFCF, government and household consumption), while income approach could be used for additional validation of the production-based GRP. The balance between the production approach and the demand approach is treated as a residual that may include net imports, change in inventories and statistical errors.***

Equality between GDP and the sum of GRPs

2.13 **Brazil** – if the discrepancy between GDP and the sum of GRPs is significant GRPs should not be published

2.14 ***Conclusion: If a discrepancy exists between regional and national data, it should be negligible (i.e. due to some balancing procedures) and clearly explained to users. If the discrepancy is large, revisiting of basic data and compilation methods are recommended. Data with large discrepancy should not be published.***

Constant prices: should national or regional price indexes be used for deflation purposes?

2.15 **India** – It is difficult to compile price indices at regional level.

2.16 **China** – There are 3 regional levels (national, provincial/municipalities, prefectures). PPI and CPI are calculated by NBS and used by provinces. They cannot reflect the real situation at local level in a timely manner. At the same time there are some controversies between prices set at national level and the local prices.

2.17 **Australia and Canada** - It is reported that Australia and Canada mostly use national price indexes for deflation purposes. In Australia, only construction is deflated by local price indices.

2.18 **Viet Vu** – One may assume that prices of traded goods vary similarly across regions, however, if price indices are at highly aggregated level, than it may be a problem at the regional level when prices of commodities within the same aggregate grouping vary differently and when the composition of commodities within the grouping in the region is not the same as the national average. If national prices are used, for commodity-driven economy regions, prices should be at appropriately detailed level.

2.19 ***Conclusion: Appropriate deflators for estimating constant prices should be developed and used, if possible, at an appropriately detailed level. To avoid inconsistency between national and regional data at constant prices, the use of average national prices is acceptable for deflating regional goods and services. However, countries may improve it by developing local price indexes for non-***

traded goods and services such as construction services. Use of regional CPIs is recommended for final consumption and services.

Supra region: should this concept be adopted and for what activities?

2.20 **Australia** – Case by case basis should be adopted for deciding whether a unit belongs to the supra region. If there are significant offshore transactions it will be good to include it in the supra region, otherwise for small like embassies abroad – could be debated. [Australia allocates costs of embassies abroad proportionally to all regions.]

2.21 **India** – Per capita GRP may be distorted, however some units/activities could be allocated.

2.22 **Viet Vu** – Supra region comes from the residency criteria. Local government does not have control over the units and the units also do not provide significant benefits to the region where they are located. Countries should decide which unit is not a resident of the region on the basis of the employment and other income benefits brought to the region, in addition to other SNA criteria.

2.23 **China** – how to better distribute the supra region?

2.24 **Viet Vu** – Similar to the treatment of international organizations – compensation of employees of the IOs (locally recruited staff) is recorded as income received from abroad by the economy; the output is recorded in another economy.

2.25 **Australia** - Working definition on what should be considered a supra region unit needs to be elaborated in the future handbook. Decision making tree for countries to decide would be helpful.

2.26 **Vietnam** – Should the national army be treated as part of the supra region?

2.27 **Australia** - The SNA rule is – where the production activity takes place. In the case of army, if it is in one region, then the activity is there and should be included in that region.

2.28 ***Conclusion: Activities to be included in the Supra-region should be decided on a case by case basis by countries. The future handbook on GRPs should include a working definition and criteria, if possible a decision tree, to decide what is the coverage of the supra region***

Statistical units: establishment or enterprises? Should head office and other ancillary activities be treated as establishments?

2.29 There are only two countries in the workshop that use enterprises as statistical units. They seem to face similar problems: (1) in current prices, the sum of GRPs is always higher than the national GDP; and (2) the rate of growth of the sum of GRPs is always higher than the rate of growth of GDP. The same

problems are also repeated in China at the lower level in the relationship between the province and the prefectures. It is clear that the use of enterprise as the statistical unit is the cause of the discrepancy.

2.30 At the national level, the use of either enterprise or establishment will produce the same GDP (see the Appendix of Part I). It is however not sufficient to compile appropriate value added by industries either at the national or local levels, neither is it sufficient for the identification of activities by location, as it may potentially lead to double counting. The reason is that a local unit might be counted twice, first as part of the enterprise at the place where the enterprise is located but where the activity does not take place and second also as a local unit at the place where the activity takes place. A unified Business Register with information by enterprises and their establishments by location should be used as a sample frame for the surveys of all provincial offices.

2.31 ***Conclusion: New SNA 2008 recommendations for the treatment of the headquarters were accepted in the compilation of regional accounts. This means that they and similar ancillary activities operating at regional economies should be treated as production statistical units.***

National industries: what should be treated as national industries?

2.32 The list presented in the meeting includes the following industries:

- Electricity
- Postal services
- Transportation (interregional bus, railroad, airline, ships, pipeline, etc.)
- Operation and maintenance of highway
- Mobile phone and other telecommunication activities
- Banking and other financial activities
- Government services

2.33 **Canada** – Production is a result of the use of capital and labour inputs. Some activities may have fewer employees but significant capital stock. The sum of compensation of employees and consumption of fixed capital should be used as indicators for allocation of national data to the regions.

2.34 **India** – Suggested that we should look for other indicators.

2.35 **Vietnam** – How should one deal with hydroelectricity – it is generated in one particular location, and then electricity is distributed to companies in other regions.

2.36 **Viet Vu** – The allocation should be based on production indicator not consumption indicator.

2.37 **Malaysia** – For some industries – employment in the region is used – such as for transport, airlines. Employees may be mobile, if the headquarter reports on where they are employed, they will be included in one region only.

2.38 **Indonesia** – Total population is used for electricity; total number of passengers for transportation. These indicators are considered better than employment for those activities.

2.39 ***Conclusion: List of national activities (electricity, post, etc.) should be established in each country and appropriate indicators for their allocation by region identified. Indicators should reflect the production that occurs in a region.***

Mobile assets: how mobile asset be regionalized?

2.40 **Canada** – Convention is taken – the non-mobile capital stock is allocated to region where they are located. A mobile asset is allocated to places where it operates. Similar to notional site which is created for foreign construction activity to avoid recording of import and export, a notional unit is created for a mobile asset to capture its production in the region where it operates. [The allocation affects the treatment of assets as capital stock, gross capital formation, consumption of fixed capital and the production of service using the asset.]

2.41 ***Conclusion: a mobile asset should be placed where it operates. If there is no a production statistical unit, a notional unit should be created.***

Taxes and subsidies: how taxes and subsidies be regionalized?

2.42 **Canada** – A distinction is made between taxes paid by businesses and consumers. Taxes paid by businesses should be allocated to the enterprises in the region, while consumer taxes should be allocated to where the consumer resides. Canada focuses more on GDP by expenditure approach and therefore taxes paid by consumers need to be identified. Canada however cannot trace the flows of taxes paid on products by consumers to where the products are produced.

2.43 **Australia** – identifies taxes on products with locations where products are produced.

2.44 **Viet Vu** – To be consistent throughout the three approaches, basic price valuation should be adopted to measure output, value added and GRPs and the issue with taxes and subsidies will be eliminated. This means that taxes and subsidies should not be allocated to regions.

2.45 ***Conclusion: The issue of allocating taxes less subsidies to regions is considered complicated from the conceptual point of view, therefore, no recommendation was made and the decision on how to do it is left to countries.***

Informal sector: How informal activities be estimated for regional economies?

2.46 **India** – Supports the suggestion made in the presentation. India wants to mention that it has a household survey through which only expenditure categories are asked as information on income provided by households were found to be not reliable.

2.47 **Philippines** – Most countries estimate the informal sector indirectly. Support the proposal. There is a need for more-frequent-than-5 year surveys.

2.48 ***Conclusion: The workshop supports the recommendation that the benchmark household income and expenditure surveys serving both national and regional purposes be conducted by countries at least every 5 years, although the need for more frequent surveys is emphasized. The difference between the employment from the establishment and LFS surveys is recommended for estimating the informal sector activities in developing countries. Thus it is recommended that countries carry out regularly establishment survey on employment and labor force survey.***

Part II

COUNTRY PRACTICES IN THE COMPILATION OF GROSS REGIONAL PRODUCTS

Introduction

1. In this chapter, country practices are presented alphabetically. The summary of a country practice is based on the presentation at the Workshop on Regional Products and Income Accounts, Beijing, China, 15-19 March 2010. The summary, particularly of some countries, may be skimmer than others' not because the country practice is less sophisticated but mainly because the country has not enough time to prepare the papers. Information presented by the countries is also supplemented by additional information that the author of this report can collect.

2. In the table below the main features of the countries' practices are presented. Detailed information on a particular country practice can be found in the section dealing with that country.

Practices in the compilation gross regional products in the countries which participated in the Workshop on Regional Products and Income Accounts, Beijing, China, 15-19 March 2010

	Compilation of GRPs: Centralized or Decentralized	Both bottom up and top down approach	Top down approach	Production, Income or Expenditure approach			Deflator: National or Regional (blank means no information)	Statistical unit: Establishment or Enterprise
				P	I	E		
Australia	C		✓	✓*		✓	N	Est.
Brazil	D	✓		✓				Est.
Canada	C	✓		✓	✓	✓	R***	Est.
China	D	✓		✓	✓**		R	Enterprise
India	D	✓		✓				Est.
Indonesia	D	✓		✓				Est.
Malaysia	C	✓		✓			N	Est.
Thailand	C		✓	✓			N	Est.
Philippines	C	✓		✓		✓	N	Est.
Vietnam	D	✓		✓			R	Enterprise

* Output and value added are allocated by shares of factor incomes

** Income approach is used in services; production approach is used for goods production.

*** Canada deflates regional GDP by deflating regional final expenditures by consumer price indexes.

Chapter 3. AUSTRALIA[2]

3.1 Australia is a country with a population of 22.5 million people in 2010 and a vast territory. It has 6 states and 3 mainland territories (Australian Capital Territory, Northern Territory, Jervis Bay Territory).

3.2 The Australian Bureau of Statistics is a centralized statistical system responsible for basic data collection and for compiling national accounts statistics at the national level such as gross domestic production (GDP), and at the state level such as gross state product (GSP), and other macro-economic systems like the balance of payments and government finance statistics. Gross state products (GSP) are prepared for 6 states and only 2 mainland territories.

A. Methodology

3.3 Australia adopts basically the top down approach for calculating GSP, by regionalizing national value added of each industry to the state level. This guarantees that state industry value added adds up to national value added and GSPs add up to GDP. The following steps are adopted:

1. Estimate GSP(I) – the production/income approach - by using shares of state factor income[3] of industry to regionalize national value added in current prices;
2. Estimate GSP(E) – the final expenditure approach - with interstate and changes in inventory measured by dissecting national aggregates using economic model; [This is done for both current and constant prices.]
3. Derive price deflator from step (2); [This means that regional price indexes are implicitly derived from national price indexes.]
4. Apply price deflator obtained in (5) to deflate GSP(I);
5. GSP (I) is released as official statistics;
6. Discrepancy between GSP(I) and GSP(E) is also published as statistical discrepancy.

3.4 Although GSP (I) is released as official statistics, the Australian Bureau of Statistics (ABS) also publishes GSP(A) as the average of GSP (I) + GSP (E). In considering the merits of the various options, the ABS, concluded that the average measure is preferred. The ABS considers this measure maximizes the use of information about state economic activity and that it

[2] This part is based on the presentation of Michael Smedes, Australia National Accounts: State Accounts at the Workshop on Regional Products and Income Accounts, Beijing, China, 15-19 March 2010.
[3] Factor income includes compensation of employees, consumption of fixed capital and net operating surplus.

will be more stable over time (i.e. subject to smaller revisions) than the two other alternatives. This approach is also consistent with the approach used nationally for the latest year estimates and for the quarterly national accounts.

I. Gross state product by expenditure approach - GSP(E)

3.5 GSP(E) is calculated for each state by adding:

- Final expenditures (government and household);
- Private and public gross fixed capital formation;
- Exports less imports of goods and services;
- A balancing item.

3.6 The balancing item includes changes in inventories and net interstate trade. This balancing item for a given state is calculated by dissecting the same national aggregates using an economic model. The model is not discussed here.

II. Gross state product by income/production approach - GSP(I)

3.7 GSP (I) is calculated for each state by adding:

- Compensation of employees;
- Gross operating surplus;
- Gross mixed income;
- Taxes less subsidies on production and imports.

3.8 GSP(I) is deflated to chain volume estimates using the implicit price deflator from GDP(E).

3.9 **GSP(I) at current prices** are calculated as follows (see table 1 for detailed information):

1. Use Australia gross value added (GVA) by industry in current prices;
2. Allocate to state using factor income shares in reference year;
3. Obtain state GVA by industry in current prices;
4. Apply quantity revaluation or price deflation to create the output indicator;
5. Use output indicator with price information to create chain volume measure;
6. Obtain state GVA by industry chain volume measures;
7. Add in ownership of dwellings and taxes less subsidies on products.

3.10 Remarks on GSP:

- Once each state's current price and volume GVA estimates have been derived for each industry and ownership of dwellings (for the real estate industry) they are then benchmarked to the Australian total for each industry;
- This ensures that the sum of the states for each industry equals the Australian total;
- Each state's benchmarked industry GVA estimates (current price and chain volume) are then summed to produce GVA at basic prices for each state;
- To derive GSP(P) taxes less subsidies on products needs to be added to each state's GVA at basic prices.

3.11 Remarks on deflation:

- A number of price indexes are representative of national, rather than state, price movements;
- Single deflation methodology used – output used as an indicator for value added, data on intermediate consumption not available on timely basis;
- Australia does not produce state supply-use or input-output tables - product mixes within industries may vary on a state basis, this is not picked up;
- Allocation of activity spread across regions i.e. Mining operation versus Mining company headquarters.

B. Data

3.12 Main data sources include the following:

1. Quarterly Business Indicator Survey
   - All private non-financial corporations (excluding agriculture) by state.
   - Data Items: Sales, Wages, Profits, Inventories.
2. Government Finance Statistics
   - All general government and public corporations by state/national.
   - Administrative data from other government departments.
3. Mining, Agriculture, Finance and Insurance, Health, Education
4. Price Indexes
   - Consumer Price Index (by state);
   - Producer Price Indexes (national except for construction);
   - Labour Price Index (by state).

Table 1. Detailed information on GSPs by income/production approach

Industry	Methodology	Price Indexes
A - Agriculture, Forestry and Fishing	Combination price deflation and quantity revaluation. Double deflation (for Agriculture) and quantity revaluation (for Forestry and Fishing). State production value data and quantity data.	Producer Price Indexes
B - Mining	Combination price deflation and quantity revaluation. State production value data and quantity data	Producer Price Indexes
C - Manufacturing	Price deflation method. Current price turnover & GVA by state by sub-division	Producer Price Indexes
D - Electricity, Gas, Water and Waste Services	Combination price deflation and quantity revaluation. Electricity Gas and the Water groups are compiled by quantity revaluation at the subdivision level Waste services compiled by price deflation	Producer Price Indexes
E - Construction	Price deflation method. Current price turnover by state by sub-division	Construction price indexes by state
F - Wholesale Trade	Price deflation method. Current price turnover by state by sub-division	Producer Price Indexes
G - Retail Trade	Price deflation method. Retail turnover data for all of Retail	Consumer Price index
H - Accommodation and Food Services	Price deflation method. Turnover data by subdivision	Consumer Price index
I - Transport, Postal and Warehousing	Combination price deflation and quantity revaluation. Turnover data for transport and warehousing, quantity data for postal	Producer Price index
J - Information Media and Telecommunication	Price deflation method Turnover data by subdivision	Consumer Prices Index
K - Financial and Insurance Services	Quantity revaluation method. National data are collected from the Australian Prudential Regulatory Authority (APRA) State splits using hours worked by state, by industry group from the Labour Force survey	Domestic Final Demand IPD
L - Rental, Hiring and Real Estate Services	Price deflation method. Current price turnover by state by sub-division	Producer Price Index
P - Education and Training	Quantity revaluation method. Student numbers for Preschool, Primary and Secondary, University, Vocational Education & Training Public sector expenditure on education by state is sourced from the Government Finance data	-

Industry	Methodology	Price Indexes
Q - Health Care and Social Assistance	Combination price deflation and quantity revaluation methods. Private health turnover Public health number of treatments	Consumer Price Index
R - Arts and Recreation Services	Price deflation method. Current price turnover by state by sub-division	Consumer Price Index
S - Other Services	Price deflation method. Current price turnover by state by sub-division	Consumer Price Indexes
Ownership of dwellings	Quantity revaluation method National current price split into states using the state shares of TFI Current price state estimates are quantity re-valued using the CVM for HFCE - Gross Dwelling Rents (actual plus imputed rent from owners of dwellings)	Consumer Price Index
Taxes less subsidies on products	Quantity revaluation method Government Finance data are used to determine state shares	-

Chapter 4. BRAZIL[4]

4.1 Brazil is a populous country with 196 million people in 2008. It is a federation composed of twenty-six states and one federal district. Each state is the divided into municipalities. States have autonomous administrations, collect their own taxes and receive a share of taxes collected by the Federal government. Each state elects its own governor and a legislative body; it also has independent Courts of Law for common justice. Despite this, criminal and civil laws can only be voted by the federal bicameral Congress and are uniform throughout the country.

4.2 GDP, annual and quarterly, for the national economy are compiled by the Brazilian Institute of Geography and Statistics (IBGE). Gross regional products, annual and quarterly, for the 26 states and the federal district are prepared by local statistical institutions (LSI), which may be a state statistical agency or other local agencies.

4.3 The compilation of Gross regional products (GRPs) is guided by the technical committee that decides on the methodology.

A. Methodology

4.4 Brazil uses the production approach to GRPs and compiles them for both current and constant prices. GRPs are calculated as the sum of gross value added for 15 economic activities. Due to the adjustment at the data level, the sum GRPs is equal to GDP.

4.5 A special feature of the Brazil statistical system is that a centralized statistical data base is created that includes both national data and regional data. Data collected by the central BIGE either by the means of census, sampling surveys or through administrative sources such as the Ministry of Finance, Central Banks, Customs, etc. are distinguished into two types of data: data of uni-regional units that operate exclusively in one region and data of multi-units which operate across more than one region. The later has to be regionalized or distributed to 27 regions. Data on

[4] This part is based on Brazil Regional Accounts presented by Roberto Olinto Ramos, Head of National Account Coordination; Frederico Cunha, Head of Regional Account Area; and Adalberto Maia Head of Rio Grande do Sul Area at the International Workshop on Regional Products and Income Accounts, Beijing, China, 15-19 March 2010.

uni-regional units may also be collected by regional statistical agencies to supplement data collected by central BIGE. (See figure 1 and figure 2).

4.6 All data are classified and verified so that they are summed to national levels. Normally, the residual difference of 2% is prorated. The database can be verified by both central and regional statisticians. Data can be modified if both national office and regional offices verify and agree with the changes. Meetings between the national office and regional offices are carried out two times a year during the compilation of annual estimates. First estimates of regional and national data shown in figure 3 are obtained after the complete database is in place. These estimates are reviewed in the first meeting between central and regional statisticians. The second meeting in figure 3 will finalize the annual estimates of both GDP and GRPs, except that GRPs are two years late as compared to the reference date.

B. Types of data in the Brazil data base

Figure 1

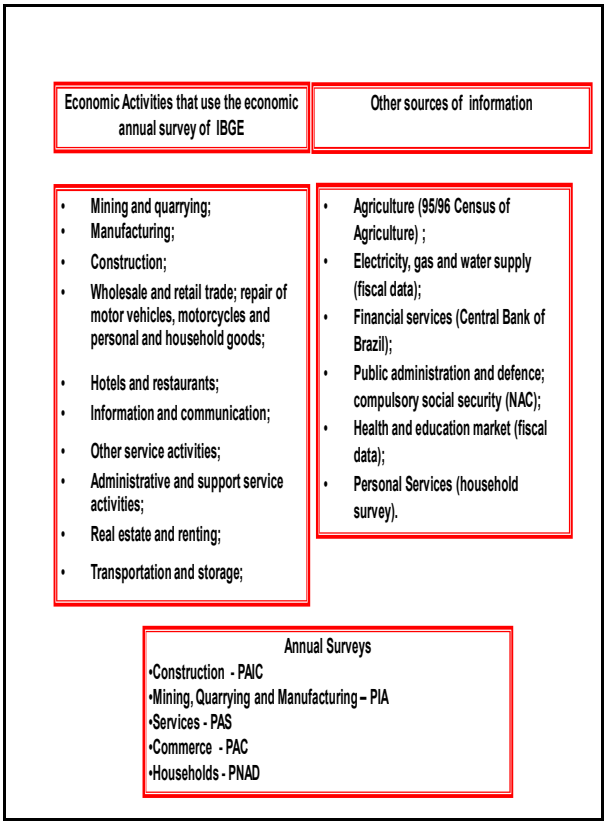
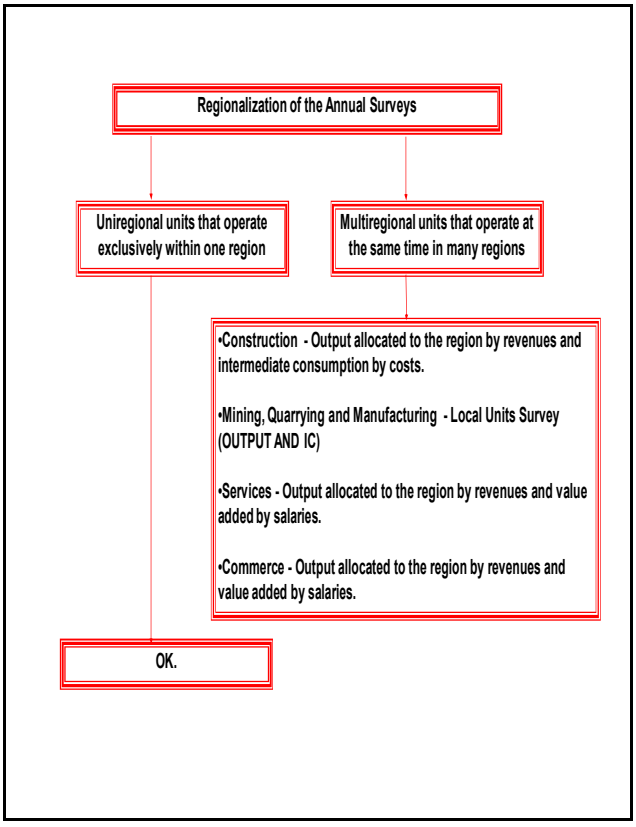
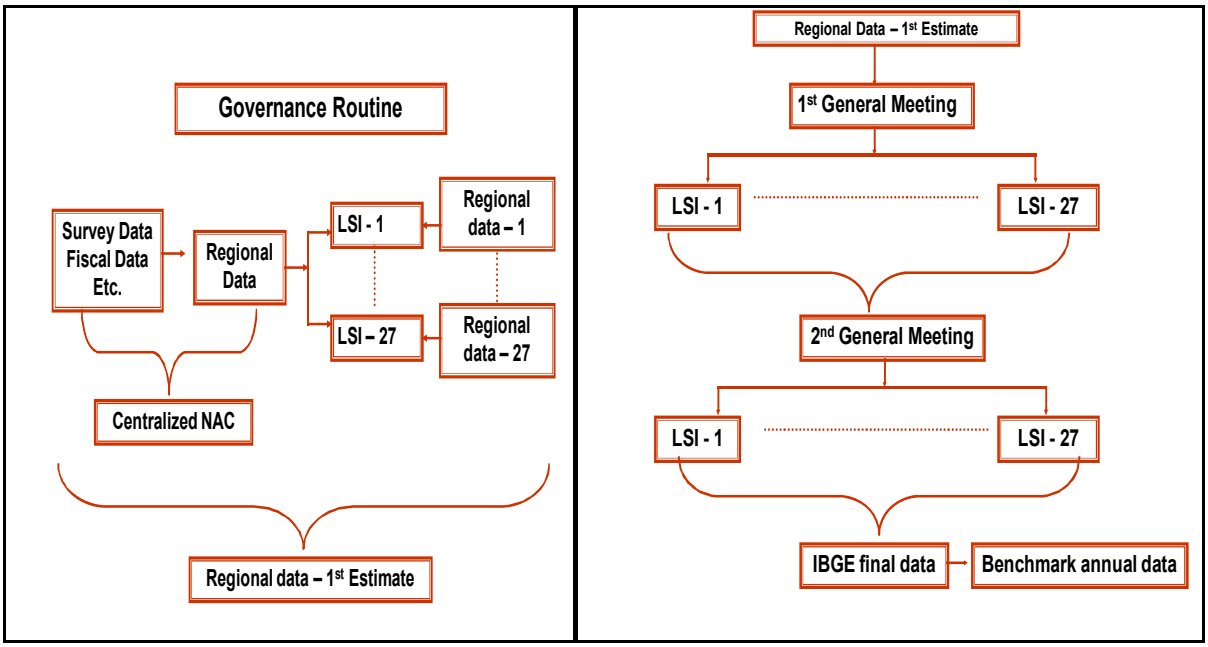


Figure 2



Coordination for the preparation of the database for both national and regional use

Figure 3



4.7 The releases of GDP/GRP are as follows:

March:	Preliminary GDP (national) of previous year (T-1).
October:	Definitive GDP (national) of year (T-2).
	Revised GDP (national) of previous year (T-1)
	Gross regional products (GRPs) of year T-2
December:	GMPs of municipalities of year T-2.

Chapter 5. CANADA[5]

5.1 Canada is a country with a population of 55.7 million people in 2009 and a vast territory. It has 10 provinces and 3 territories.

5.2 Statistics Canada, similar to the Australian Bureau of Statistics, is also a centralized statistical system responsible for basic data collection and for compiling national accounts statistics at the national level such as gross domestic production (GDP), and at the provincial level such as gross provincial product (GPP), and other macro-economic systems like the balance of payments and government finance statistics. As Canada's central statistical agency, Statistics Canada is legislated to serve this function for the whole of Canada and each of the provinces.

A. Salient features of the gross state products of Canada

5.3 To understand why Canada has the most sophisticated system of gross state products including sate input-output tables (or more precisely state use and supply tables), one needs to be familiar with the following salient features of the Canadian statistical system.

I. GSP by final expenditure by state are required for the purpose of allocating tax and federal transfer payments to the states

5.4 The Canadian legislation requires that:

- Value added tax is collected by federal government on behalf of provinces, and allocated to those provinces on the basis of regional economic accounts expenditure estimates;
- Federal transfer payments allocated to provincial governments are also based on regional accounts data.

5.5 Thus GSP compiled by expenditure approach is required for the allocation purposes mentioned above.

II. The system is built around full articulation of annual I-O tables (more precisely supply and uses of goods and services) at both national and provincial levels

[5] This part is based on the presentation of Arthur Berger, Canada's Provincial and Territorial Economic Accounts at the Workshop on Regional Products and Income Accounts, Beijing, China, 15-19 March 2010.

5.6 The national accounts data prepared for the national as well as provincial levels are the most complex in the world. The system is fundamentally bottom up, which is built on the detailed I-O tables that describe production and uses of goods and services in the economy for every province and the whole national economy. Thus, the compilation of GSP and GDP can be based on three approaches: the production approach, the income approach and the final expenditure approach.

5.7 The basis for regional products of Canada is the annual regional I-O tables for 13 provinces and territories which have the same dimension as the national I-O table (500 industries, 727 commodities and 170 categories of final demand). The regional I-Os are ready three years after the reference year. For example I-O tables for 2006 are available in 2009.

5.8 Exports and imports of 727 commodities (from rest of the world countries and other provinces) are also prepared by modeling.

5.9 Regional I/O tables add-up to the national I/O tables. National I/O tables in constant prices provide benchmark for national real GDP by industry.

5.10 Regional I/O tables provide current price benchmark for regional income and expenditure based GDP, and regional value added by industry. There are no regional I/Os in constant prices.

B. Data sources for annual I-O tables (serving as benchmark)

5.11 This part summarizes the strategy for data collection, data estimation, and the objectives and types of surveys that are frequently carried out.

I. Strategy for data collection/estimation for industry estimates

5.12 Strategy for data collection for industrial production is as follows:

- Annual surveys, mostly establishment based, sampling designed to produce accurate estimates by province.
- Samples are usually divided into three strata:
  - take all (large companies that operate in more than one industry and/or more than one province);
  - take some (medium sized companies);
  - take none (smaller companies that operate in only one province and only one industry).

- Income tax data is used for take none stratum
- Other sources:
  - Labour expenses by industry – taxation data;
  - Construction – capital expenditure survey for output;
  - Financial industries – administrative data + enterprise survey data;
  - Income tax data + occasional surveys.

II. Strategy for data collection/estimation for final expenditures estimates

5.13 Strategy for data collection for final expenditures is as follows:

- Personal expenditures: retail trade survey + survey of household spending + service industry surveys + administrative data;
- Capital expenditures: capital expenditure survey;
- Investment in inventories: industry surveys;
- Government current expenditures: public accounts;
- International imports and exports: customs data (data exchange with USA) for merchandise, survey data for services;
- Inter-provincial imports and exports: combination of survey data and modeling.

III. Balancing of supply and uses of goods and services

5.14 Strategy for balancing supply and use of goods and services is as follows:

- National and provincial/territorial supply/use data are balanced in successive iterations;
- National balancing adjustments serve as a guide for provincial/territorial adjustments;
- Implications at provincial/territorial level provide feedback loop for re-adjusting; national estimates (i.e. Petroleum extraction = 7% of national GDP, 51% of Alberta provincial GDP).

IV. Types of data and data sources

5.15 Type of data and data sources include:

- Corporate profits – quarterly survey of financial statements, income tax data;
- Labour income – monthly household survey of labour force, monthly payroll survey, administrative data;

- Personal expenditures - monthly retail trade survey, annual survey of household spending, service industry surveys, administrative data;
- Capital expenditures - annual capital expenditure survey, monthly construction payroll data, monthly manufacturing survey (shipments of building materials and machinery and equipment) and international trade data (machinery and equipment);
- International merchandise trade – monthly customs data (provincial allocation is challenging);
- International services trade – quarterly and annual surveys;
- Inter-provincial trade – model based on input output tables trade flows and aggregate production and demand data.

V. Deflation

5.16 Price indexes used for deflation are as follows:

- Personal expenditures – consumer price index;
- Engineering construction expenditures – labour and material input prices;
- Home and building construction expenditures – building price index;
- Machinery and equipment – machinery and equipment price indexes;
- Government current expenditures – hourly wages of government employees;
- Exports – unit values, domestic producer price indexes (exchange rate pass-through assumption);
- Imports - unit values, foreign producer price indexes (exchange rate pass-through assumption).

C. Regional income and expenditure accounts (Regional IEA)

5.17 The benchmark national and provincial I-O tables are prepared annually, but they are ready for use only three years after the reference date. For this reason, Canada has to prepare preliminary but up-to-date estimates of GSP and GDP annually, quarterly and even monthly. For annual estimates which are in both current and constant prices:

- Preliminary estimates are published 4 months after reference period (i.e. 2008 estimates published April 2009);
- Revised estimates for most recent 4 years are published 7 months later (i.e. 2005-2008 revised estimates published November 2009); Revisions incorporate most recent I/O tables + all other new information.

C$: Current prices.
K$: Constant prices.
I/O: Input-output tables.
IEA: Integrated economic accounts.

Benchmarking:

- Regional IEA C$ benchmarked to regional I/O C$ (up to 2006 so far);
- Regional IEA C$ benchmarked to national IEA C$ (2007 & 2008);
- Regional IEA K$ benchmarked to national IEA K$ (all years);
- National IEA C$ benchmarked to national I/O C$;
- National IEA K$ not benchmarked to national I/O K$;
- National and regional GDP in IEA very similar to national and regional GDP by industry, but not identical.

Detail - Aggregates:

- GDP at market prices income based (C$) and expenditure based (C$ and K$). The official GDP for Canada are expenditure based.
- Net Domestic Product at basic prices(C$).

D. Publication

5.18 Data on production accounts are published for component of value added and final expenditure with the following details:

Detail - Income:

- Labour Income – 16 industrial sectors;
- Corporate Profits – total economy; no industrial detail.

Detail – Expenditures:

- Personal Expenditures: about 60 categories of goods and services.
- Capital Expenditure:
  - Residential structures, buildings, engineering structures, 10 categories of machinery and equipment;
  - All broken down by government and business.
- Imports and Exports: 9 goods categories, 5 service categories.

Detail – Institutional Sector Accounts:

- Sources and disposition of personal income (includes persons, unincorporated businesses and non-profit institutions serving households);
- Government sector tax revenue, investment income, transfer payments, subsidies.

Regional GDP by industries:

Timing:

- Same publication dates as the regional income and expenditure accounts.

Detail:

- Same level of industry detail as found in the regional input-output tables.

Data Sources:

- Monthly and annual industry surveys;
- Monthly payroll survey;
- Administrative data.

Chapter 6. CHINA[6]

6.1 China has a population of 1,559 million people in 2009 and a vast territory. It is divided into 23 provinces (including Taiwan), 4 municipalities which include Beijing, Shanghai, Tianjin and Chongqing, 5 autonomous regions and 2 special administrative regions (which include Hong Kong and Macau). Municipalities and autonomous regions are equivalent in status to provinces. Prefectures are the administrative level immediately below the provincial level.

6.2 China adopts a decentralized statistical system. At the central level, the National Bureau of Statistics (NBS) established under the State Council is responsible for organizing, directing and coordinating the statistical work throughout the country. At the provincial and ministry levels, the People's governments at all levels and all departments, enterprises and institutions may, according to the needs of their statistical work, set up statistics institutions and staff them with statisticians.

6.3 According to the law, the NBS either alone or jointly with the National Bureau of Standards formulates national statistical standards. Other departments of the State Council may formulate supplementary departmental statistical standards, however, departmental statistical standards may not conflict with the State statistical standards.

6.4 From 1985 the SNA has been adopted by China; GDP is compiled by NBS and gross provincial products (GPPs) are compiled by provincial bureaus of statistics (PBS). Since 1992, quarterly GDP and quarterly GPPs are adopted. Both annual and quarterly GDP and GPPs are compiled using two approaches: the production approach and the final expenditure approach. In many provinces, GDP at municipalities are also prepared both annually and quarterly.

6.5 Although there are regular meetings between NBS and PBSs to review provincial estimates, discrepancy between the sum of GPPs and GDP is significant; so is the rate of growth of GDP and the rate of growth of the sum GPPs. The main reason for the discrepancy is the use of enterprises as statistical units. As an enterprise may operate at different provinces, the use of enterprise financial statements for the compilation of GPPs without proper methods for identifying their local activities and proper allocation of value added, in some cases identification of value added at local levels may be missed while in other cases, activities at the headquarter may be over-counted. The fact that the sum of GPPs always exceeds GDP testifies to this identification problem.

[6] This part is based on the report, China's Regional GDP Account presented by Zhao Tonglu at the International Workshop on Regional Products and Income Accounts, Beijing, China, 15-19 March 2010.

A. Methodology

6.6 The method of compilation is established by NBS to be followed by all regional bureaus of statistics. The following summarizes the main features of gross regional products in China.

I. Classification

6.7 For annual accounts at the national level, value added is prepared for 94 economic activities, however for quarterly accounts value added for only 14 economic activities are prepared.

II. Data collection

6.8 Data on enterprises whose output is above a cutting point are collected by enterprise surveys that are benchmarked on the economic census data covering industrial, construction and service activities but excluding agriculture. Data of smaller units are estimated on the basis of administrative records like taxes. In addition the following administrative records are also used: financial data, tax data, data of People's Bank of China, Insurance Regulatory Committee and Securities Regulatory Committee, of Industrial and Commercial Administration, and of the Ministry of Civil Affairs.

6.9 At the national level, administrative records on nonmarket services can be used directly. However at the local levels surveys may have to carry out to identify local services. Difference may be the result of different methods of surveys. The same also occur to market services, surveys for the national level is carried out by NBS while surveys at local levels are carried out separately by local bureaus of statistics. Non-integrated survey may result in discrepancies between the national data and sum of the provincial data.

B. Methods of estimation

I. Growth of value added method

6.10 Value added in constant price is equal to value added of last year multiplied by indexes on growth rates of output of current year.

6.11 Growth rates of output, may they be quantity or volume indexes, are used for the following activities: Railway transportation, road transportation, water transportation, airline transportation, pipe transportation and post service, hotels and restaurants and wholesale and retail trade.

II. Value added at current prices

6.12 Value added at current prices is estimated by multiplying output with value added ratios. These value added at current prices are then deflated to constant prices.

6.13 This method is applied mainly to agriculture, forestry, animal husbandry, fishery and construction.

6.14 For industrial activities, value added is calculated on the basis of both surveys of cost of materials used and administrative records. The surveys depending on the activity may include comprehensive surveys, sample surveys and surveys on key materials.

III. Income approach

6.15 Income approach requires the sum of compensation of employees, depreciation and operating surplus approximated by profits. This method is applied to the service activities.

B. Review process

6.16 From 2005 onwards, NBS and PBSs are implementing a joint review, which focuses presently on quarterly GDP. The review includes the review of methodology, review of the relationship among main statistical indicators, and the review of estimates against administrative records. NBS can make adjustments to GPPs if: (i) the standard methods are not strictly followed; (ii) the derived data are found to be inconsistent with the trend of development of basic indicators; and (iii) the derived data do not match with known information or administrative records.

6.17 Inconsistencies between national GDP and the sum of GPPs continue to exist. This is due to the fact that different sources of administrative data are used and particularly different ways of surveying services at regional and national levels. The main difference is in the industrial activities.

6.18 In 2009 national GDP is higher than the sum of GPPs by 8%. The reason for this seems to be the result of the using in China of enterprise as the statistical unit that tends to double count activities reported at the headquarter and the same activity reported at the local levels.

6.19 In ordinary years, the rate of growth of the sum of GPPs is higher than the rate of growth of GDP by 2%. In 2009, it is 2.9% higher.

C. Other issues

I. Gross sub-provincial product

6.20 China is one of the few countries that also compile gross sub-provincial product both annually and quarterly. In many provinces or municipalities[7] (which is equivalent in status to province), gross prefectural products are compiled. An example is Chongqing which has a population of 52.7 millions.

6.21 According to the report by Chongqing Municipality Bureau of Statistics (MBS),[8] the same procedures in monitoring and reviewing data and methodology by the NBS in coordination with PSBs are applied to the relationship between the MBS and bureaus of statistics at the prefecture levels. Documents on methodology that are in line with the methodology decided by NBS but based on the actual situation in the Chongqing municipality are developed to guide the compilation at the lower levels.

6.22 The discrepancy between the sum of GDPs of the prefectures and GDP of the municipality is more or less the same as that between national GDP and provincial GDPs. Municipality GDP is always lower than the sum of GDPs of the prefectures. The consistency in the discrepancy seems to indicate that GDP at the lower levels are double counted because of the use of the enterprise as the statistical unit.

II. Publication

6.23 Even though GPPs are reviewed by NBS, PBSs are still held accountable for their estimated GPPs and they are responsible for their publications.

6.24 Provincial and municipalities GDP are generally published 21 days after the publication of the national GDPs and prefectural GDP are generally published 22 days after the publication of the provincial and municipalities GDP.

[7] China has four municipalities: Beijing, Tianjin, Shanghai, and Chongqing.

[8] This part is based on Introduction to prefecture (county) GDP accounting of Chongqing presented by Qin Yao at the International Workshop on Regional Products and Income Accounts, Beijing, China, 15-19 March 2010.

Chapter 7. INDIA[9]

7.1 India is a country with 1,170 million people in 2009 with vast territory.

7.2 It is a federal structure of governance and has a decentralized statistical system. It has 28 states, 6 union territories and 600 districts. Statistics comes under the *concurrent list* of the legislative power of the Government, where both the Union and State Governments can operate, while others are under the *Union List* where only the Central Government has the authority to legislate or under the State List where only the states have the authority to legislate.

7.3 At the central level, the Ministry of Statistics and Programme Implementation (MoS&PI), of which the Central Statistical Office is a part, is the nodal agency for a planned development of the statistical system in the country and for bringing about coordination in statistical activities among statistical agencies in the Government of India and the States. The collection of statistics for different subject-specific areas, like agriculture, labour, commerce, industry, health and education etc., rests with the corresponding administrative ministries.

7.4 At the state level, similar to the central level, the State Statistical System has:

- At the apex level the Directorate of Economics and Statistics (DES), which is responsible for the coordination of statistical activities in the State; and
- Departments of the State Governments, such as, agriculture or health which have large statistical divisions for the work of departmental statistics.

7.5 The Directorate of Economics and Statistics in the States keep liaison with the CSO for purpose of coordination at all-India level.

7.6 With such an organization, the states are responsible for compiling the gross state product (GSP) and gross district product; the Central Statistical Office is responsible for national gross domestic product (GDP).

A. Methodology for estimating gross state product (GSP)

I. General feature

7.7 Gross state products (GSP) are compiled by a combination of production and income approach.

[9] This part is based on Country Presentation – India by Mr. Janardan Yadav at the Workshop on Regional Products and Income Accounts, Beijing, China, 15-19 March 2010.

7.8 Due to non- availability of data, estimates are not compiled using expenditure approach.

7.9 GSP are compiled by economic activity.

- First the estimates at disaggregated level for each economic activity are compiled.
- These are then aggregated for the whole region/state.

II. Estimates of value added by production approach

7.10 The estimates for commodity producing sectors like agriculture, forestry, fishing, mining and quarrying, manufacturing, etc. are prepared using the production approach, i.e., measuring the value of output and then deducting from there the cost of material inputs used in the process of production.

III. Estimates by value added per worker

7.11 The estimates for the services sectors like trade, transport, hotels and restaurants etc. are prepared by income approach, specifically, by multiplying the value added per worker by the number of workers.

IV. Estimates by extrapolating benchmark figures

7.12 The benchmark estimates are extrapolated with suitable indicators for the annual estimates:

- The information on value added per worker is obtained from the relevant Enterprise Surveys conducted for the purpose.
- The estimates of workforce are obtained using the results of large-scale sample surveys on employment and unemployment conducted by National Sample Survey Organisation (NSSO) and decennial population census.

7.13 In the case of district domestic product, the estimates for commodity producing activities and for public service activities are generally compiled on the basis of data available at district level.

7.14 For other private sector segments, the workforce data is used to allocate state level estimates across the districts.

V. Treatment of national industries

7.15 Certain activities operate across state boundaries, and thus their economic contribution cannot be assigned to any one state directly. These activities include railways, communications, banking and insurance and central government administration. They are known as national industries of the economy.

7.16 The estimates for these supra regional activities are compiled for the economy as a whole and allocated to the states on the basis of relevant indicators.

VI. Reconciliation of gross regional product and national gross domestic product:

7.17 Though same set of data sources are used, the sum total of gross state products (GSP) complied by the States generally does not tally with the estimates compiled by CSO at National level because of the following reasons;

- Some of the activities like high sea drilling are not allocates to States.
- More updated data used by the States.
- Difference in the indicators/indices due to broader coverage at States.

7.18 Generally annual discrepancy remains less than 5% of the GDP.

7.19 No attempt is made to make the sum of GSPs tally with GDP.

VII. Cooperation between CSO and SSO

7.20 An annual workshop is organized by CSO to reconcile these estimates.

7.21 CSO also provides support to States by providing:

- Training;
- Sharing of data bases; and
- Software support.

7.22 These SDP estimates after reconciliation are uploaded on the website: www.mospi.nic.in.

Chapter 8. INDONESIA[10]

8.1 Indonesia is an archipelagic country with a population of 250 million people in 2009 and divided into 33 provinces which are then divided into 370 regencies and 95 cities.

8.2 Statistics Indonesia (BPS) is a Non-Departmental Government Institution directly responsible to the President. BPS is a centralized system with offices at the provincial and regency/city level.

8.3 Gross regional products (GRPs) for provinces are compiled and published yearly and quarterly by Indonesia. Every quarterly, consultation is carried out between BPS and its provincial offices. In addition, yearly consultation is only carried between island provinces particularly with respect to inter-island trade.

8.4 The table 1 below shows the availability of data sources, either on the basis of surveying by BPS or administrative data.

Table 1. Main types of data sources (examples on some activities)

Industrial Origin	**National Level**	**Provinces level (33 Provinces)** Showing data sources in terms of number of provinces
Food Crops	BPS	26:BPS; 7 Administrative data
Estate Crops	BPS	1: BPS; 32: Administrative data
Livestock & Its Product	BPS	2: BPS; 31: Administrative data
Water Supply	BPS	3:BPS; 8: administrative data; 22: reports of individual unit
Hotel	BPS	33 :BPS
Road Transport	BPS	5: BPS; 28: administrative data
Bank	BPS-Central Bank	33: BPS

[10] This part is based on Indonesia country practice presented by Adhi Wiriana at the International Workshop on Regional Products and Income Accounts, Beijing, China, 15-19 March 2010.

8.5 Table 2 shows the approach used in each group of economic activities, which is either production approach (PA) or income approach (IA), and the number of provinces where these approaches are applied.

Table 2. Main types of methodology (examples on some sector)

Industrial Origin	National Level	Provinces level (33 Provinces)
Food Crops	Production approach (PA)	33: Production approach
Estate Crops	Production approach	33: Production approach
Livestock & Its Product	Production approach	33: Production approach
Mining	Income approach (IA)	33: Production approach
Construction	Income approach	10:PA; 5:IA; 18 :others
Bank	Income approach	6:PA; 27:IA

8.6 Table 3 shows the differences between the sum of GRPs and GDP in Indonesia from 2004 to 2008. Unlike China and Vietnam, the sum of GRPs is smaller than GDP at both current and constant prices. This is true even for the rates of growth.

Table 3. Analysis of sum of GRP and GDP (billion rupiahs)

	2004	2005	2006	2007	2008
Current prices					
Total GRP	2210818	2669975	3118121	3536797	4204359
GDP	2295826	2774281	3339217	3950893	4951357
Percent difference	-3.7%	-3.8%	-6.6%	-10.5%	-15.1%
Constant prices					
Total GRP	1604036	1690311	1777950	1878739	1983834
GDP	1656517	1750815	1847127	1964327	2082316
Percent difference	-3.2%	-3.5%	-3.7%	-4.4%	-4.7%
Growth rate					
Total GRP		5.4%	5.2%	5.7%	5.6%
GDP		5.7%	5.5%	6.3%	6.0%

Source: *Statistik Indonesia* 2009.

Chapter 9. MALAYSIA[11]

9.1 Malaysia has a population of 28.5 million people in 2009. Malaysia is federation with 13 states and three federal territories of which one is the old capital Kuala Lumpur and another is the new capital Putrajaya. Gross regional products (GRPs) are compiled for 13 states, Kuala Lumpur and 6 Federal Territory of Labuan. The project was initiated in 2009. GRPs for 2005, 2006, 2007 and 2008 have been published. GRPs for 2009 are expected to be published in 2010. GRPs are in both current and constant prices.

9.2 Department of Statistics Malaysia (DOSM) is a centralized system with state offices. The compilation of gross state products is done centrally by DOSM. The compilation method is a combination of bottom up and top down approach.

A. Methodology

I. Scope and coverage

9.3 GRPs are compiled by economic activities, however, only value added by 9 classes of aggregate activities are published.

II. Data

9.4 The basis for the compilation is the preparation of the use matrix for economic activities, state by state using censuses and annual establishment surveys. These data are then complimented by estimation of informal activities at the state level.

[11] This part is based on Ms. Norzalelawati Binti Ahmad Estimation of Gross Domestic Product by State in Malaysia presented at the International Workshop on Regional Products and Income Accounts, Beijing, China, 15-19 March 2010.

Data availability in Malaysia

	Census 2005	**Annual survey**	**Quarterly, monthly surveys**
Agriculture	✓	✓ (Census, Ministry of Agriculture reports)	Ministry of Agriculture may supply data
Mining	✓	✓ (Survey + reports)	
Construction	✓	✓	National level only
Manufacturing	✓	✓	National level only
Wholesale/retail	✓ (2001-05)	National level only	National level only
Finance	Central Bank Negara	Central Bank Negara	Central Bank Negara
Transport	✓	✓, alternative year, current off point for a few.	National Account has own survey to compile GDP at national level only.
Other services	✓	Some may not be available, but for alternative year.	Same as above.

B. Compilation method

I. Benchmarking

1. Combination of bottom up and top down approach for the benchmark year

9.5 Malaysia uses both the bottom up and top down approach for the benchmark year when most of the data at both the national level and the state level are available. The bottom approach relies on surveys and censuses data of establishments carried out annually by DOSM at the state level.

9.6 The top down allocates national level GDP estimates to states by using indicators for the industry that cannot be compiled directly by production approach. Among the industries to be allocated to the states are output and value added of banking and insurance services, of electricity, telecommunication and postal services, interstate transportation, etc. The criterion for the selection of indicators is that it must reflect volume of production. Demand indicators may replace production indicators when production is reflected by demand. The list of indicators in terms of priority is as follows:

- Quantity output
- Wages and salaries (must be deflated by wage rates)
- Employment
- Sale taxes on products (must be deflated by CPI)

9.7 National industries (airline, highway, phone, postal services, etc.) are allocated only to locations where there are employment to operate them.

9.8 For other special industries, the following indicators are used to allocating national GDP to the states:

- Fisim: state share of loans and deposits.
- Life insurance: state share of loans and deposits (assuming purchasers of life insurance are proportional to the state financial ability).
- Nonlife insurance: number of cars registered by the states.
- Owner-occupied housing services: share of population with housing weighted by relative indicators of wealth (for which per capita income is a proxy).

2. Informal activities

9.9 Informal activities that are not covered by regular establishment surveys are estimated by value added per employee and employment in the informal activities. At the state level, the difference between employment in annual Establishment Survey (ES) and Labor Force Survey (LFS) is considered informal employment. The procedure is as follows:

(i) In case that employment in the industry is available from both Labor Force Survey (LFS) and Economic survey (ES) (covering only incorporated units in the list frame), the difference is considered employment in the informal sector.

(ii) Employment in the informal sector will be converted to ES labor equivalents by adjusting for their lower productivity.

(iii) The adjustment ratio = (output/labor ratio in ES)/(output/labor ration in small enterprises in ES).

(iv) Adjusted employment equivalent = ES employment + ES labor equivalents in informal sector.
(v) This adjusted employment will be used to extrapolate state constant value added.
(vi) Estimates of value added at the state level by every industry are then sum up to the national level and differences are then distributed proportionally to assure the equality between the sum of state value added and national value added for every industry.

II. Extrapolation technique

9.10 The extrapolation technique is used when data on output, intermediate consumption and value added are not available, however benchmark value added by industry data on employment by industry are available at the state level.

9.11 The extrapolation is based on the principle that value added by industry of each state grows proportionally to the growth of employment in the state, however this growth should be adjusted by the change in labor productivity of the national industry. The extrapolation and adjustment is as follows:

(i) Obtain preliminary state industry GDP by extrapolating state industry GDP of the previous year with the rate of growth of state employment equivalent in the industry or other indicators.
(ii) Calculate the national productivity (growth) index of the industry of the nation by dividing national industry GDP by the sum of preliminary industry GDP over all states.
(iii) Assume that state productivity index is the same as the national productivity index for every industry.
(iv) Adjust the preliminary state industry GDP in step (ii) by multiplying it with the productivity index obtained in step (iii).

1. $\text{prGDP}(i)^{t}_{s} = \text{GDP}(i)^{0}_{s} \times \text{Rate of growth of employment in industry } (i) \text{ in } (0-t)\text{period}$

2. $\text{Proindex}(i)^{0\text{-}t} = \dfrac{\sum_{s=0}^{n} \text{prGDP}(i)^{t}_{s}}{\text{GDP}(i)^{t}}$

3. $\text{Adjusted GDP}(i)^{t}_{s} = \text{prGDP}(i)^{0}_{s} \times \text{Proindex}(i)^{0\text{-}t}$

Notes: t stands for time, s stands for state, i stands for industry, pr stands for preliminary, Proindex stands for productivity index.

III. Readjustment to national value added by industry

9.12 Estimates of value added at the state level for every industry are summed up to the national level and differences are then distributed proportionally to assure the equality between the sum of state value added and national value added for every industry.

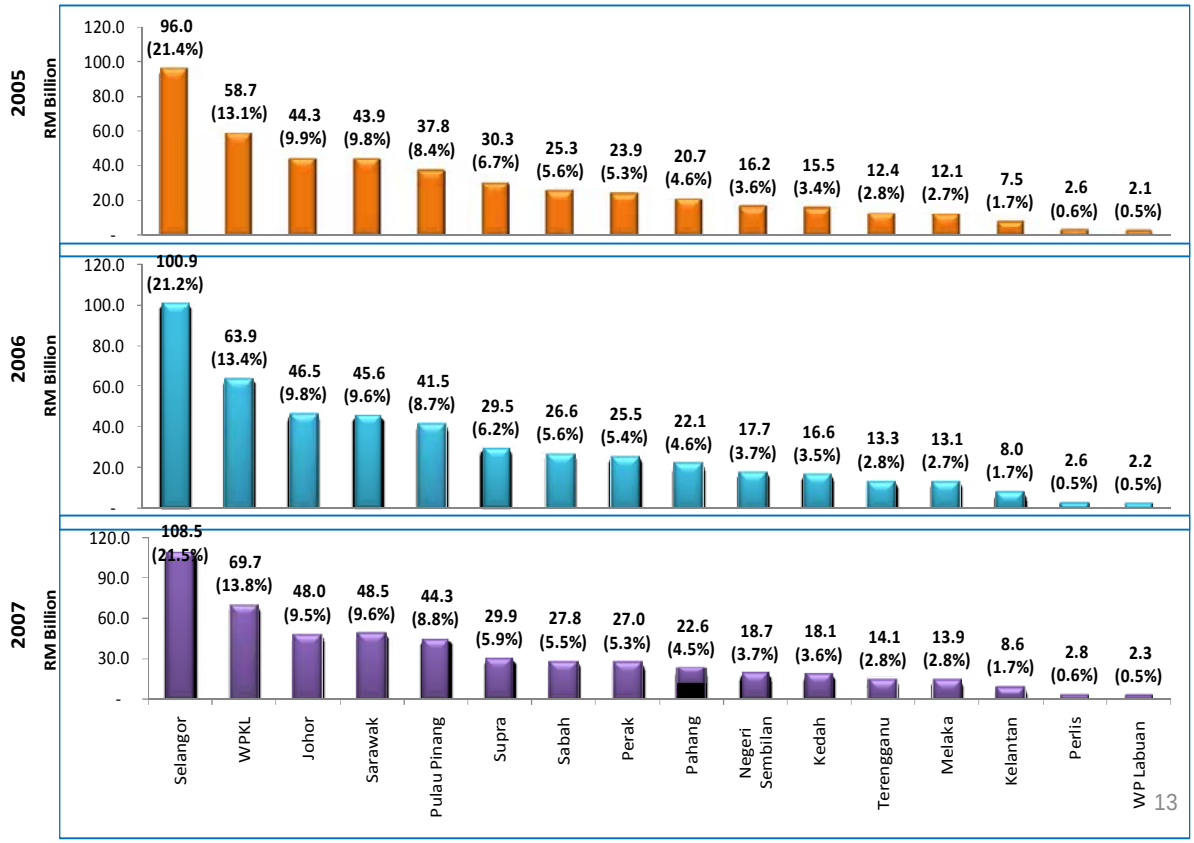
IV. Adoption of the concept of supra-region

9.13 Malaysia adopts the concept of supra-region for the off-shore production of crude oil in two states, the incomes of which are under the control of the federal government rather than to the state and the local employment is negligible. This treatment is not applied to Sabah and Sarawak as the production of crude oil were under the treaty of income sharing written before the two states joined Malaysia.

C. Some results

9.14 Figure 1 shows that the share of the supra-region was quite significant though declining from 6.7% to 5.9% of GDP.

FIGURE 1. PERCENTAGE SHARE OF GDP BY STATE IN 2005, 2006 & 2007



9.15 Due to the significant value of the off-shore production of crude oil, the moving of this activity out from the two states Teranganu and Kedah, the economic performance of these two states were no longer affected by this significant activity and per capita GDP reflect better the average income of the states.

Chapter 10. PHILIPPINES

10.1 The population of the Philippines is estimated to be 92.2 million in 2009. Currently, the Philippines is consisted of 17 regions and 80 provinces. GRP have been prepared since 1971 for 17 regions and it is now experimenting with the compilation of GDP for some provinces.

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A. On the Philippines statistical system

10.2 Gross domestic product (GDP) and gross regional products (GRP) are all compiled by the Philippine National Statistical Coordination Board (NSCB). NSCB is the policy-making and coordinating agency of the Philippine Statistical System. It is also responsible for compiling the System of National Accounts of the Philippines, relying on the basic statistics collected by the National Statistics Office (NSO) and administrative data. NSO is the major statistical agency responsible for generating general purpose statistics and undertaking such censuses and surveys as may be designated by the NSCB.

10.3 In each region, NSCB creates the Regional Statistical Coordination Committee (RSCC), which has been created by the NSCB, as the link between the NSCB and local government units on statistical matters. The RSCCs are given authority to act on statistical matters that concern only their region, province or city, municipality, and barangay. Statistical matters that are of national concern and/or may affect the other regions are elevated by the RSCC to the NSCB Central Office

10.4 The following procedure is followed:

- To ensure accuracy, consistency, and comparability of statistics among the local government units (LGUs), statistical concepts, definitions, techniques, and methodologies shall be formulated by the NSCB, through the RSCCs, with due recognition of the conditions and needs at the local levels.
- Local data, which can be produced by LGUs to arrive at regional or national figures, as may be determined by the NSCB, shall be consolidated by a national agency to be designated by the NSCB and to be incorporated into an official Data Base after being reviewed by the RSCCs.

10.5 GRP by production method was introduced in 1971 and GRP by expenditure method (GRDE) intended to complement GRP by production method was adopted in 1987. Though GRPs are compiled by both methods, the results of the production approach serve as total controls. These data are published on annual basis.

B. Methodology: gross regional product by production approach[12]

I. Classification of economic activities

10.6 GRP by production approach is prepared in terms of value added at producer prices for the following activities:

1. Agriculture, Fishery and Forestry
   a) Agriculture
   b) Forestry

2. Industry
   a) Mining and Quarrying
   b) Manufacturing
   c) Construction
   d) Electricity and Water

3. Services
   a) Wholesale and Retail Trade
   b) Transportation, Communication and Storage (TCS)
   c) Finance
   d) Ownership of Dwellings and Real Estate (ODRE)
   e) Private Services
   f) Government Services

II. Process of reconciliation between GDP and the sum of GRPs

10.7 GRP of each region is thus the sum of value added of all economic activities. Currently NSCB tries to devolve the compilation of GRP to the region. 9 regions have already come up with their estimates. The process of compilation and reconciliation is as follows:

(a) Estimates of the Central Office and the NSCB Regions go through a deliberation process by industry and by region (validation of data, major developments in the region, etc.).
(b) The final estimates are reached, in consensus with the NSCB Regions after incorporating all considerations in the deliberation process.
(c) Independent estimates from the regions, however, will not add up to the national total
(d) National total by sector is allocated to the Regions using percentage distribution.

[12] This part is based on Measuring Gross Regional Domestic Product: The Philippine Experience presented by Maria Fe M. Talento at the International Workshop on Regional Products and Income Accounts, Beijing, China, 15-19 March 2010.

III. Data sources for production approach

10.8 Data sources include the following:

- Census/Survey-based data
  - – Census of Philippines Business and Industry (CPBI)
  - – Annual Survey of Philippines Business and Industry (ASPBI)
  - – Quarterly Survey of Philippines Business and Industry (QSPBI)
- Administrative-based data
- Special Studies
- Indicators from Industry Associations (i.e., Chamber of Mines, Cement Manufacturers Assn. of the Philippines, etc.)

IV. Compilation methods

1. Current price estimation by region

10.9 The following approaches are adopted:

(a) Indirect Approach: This method uses gross value added ratios and current gross output to estimate gross value added for Agriculture, Fishery and Forestry, Mining and Quarrying

GVA = Gross Output * Gross Value Added Ratio (GVAR)

where:
GVAR = Gross Value Added / Gross Output

(b) Value Extrapolation: This method is applied to service activities using the trend of gross revenue from the Quarterly Survey of Philippines Business and Industry (QSPBI).

GVA_t = previous GVA level $_{t-1}$ * growth rate of the value of production $_{t/t-1}$

2. Constant price estimation by region: use of fixed-base year method (time period k)

(a) Single Deflation:

$$GVA_k = GVA_t / Deflator$$

(b) Quantity Revaluation:

$$GVA_k = (Qty_t * Price\ at\ base\ year)*GVAR$$

(c) Volume Extrapolation:

$$GVA_k = GVA\ level_{t-1} * (1 + GR\ rate\ of\ volume\ or\ output\ indicator_{/t-1})$$

V. Remaining problems

10.10 There are a few problems that remain to be resolved and improved. The first one is the regional allocation of output of the economic activities such as transportation and communication industries which extend beyond regional boundaries or the allocation of the cost of operations of the head office for companies with regional branches. The second one is the estimation of informal activities at the regional level.

C. Gross regional product by final expenditures approach (GRDE)[13]

10.11 In the Philippines, GPPs compiled by final expenditure approach take GPPs by production approach as control total. Gross Regional Domestic Expenditures (GRDE) is then estimated independently, the difference between GPP by production approach and GRDE is treated as residual. GRDE is the sum of:

- Personal Consumption Expenditures (PCE);
- Government Consumption Expenditures (GCE);
- Gross capital formation that includes construction, durable equipment and breeding stocks, orchard development and afforestation.

10.12 The residual include the remaining expenditure items in final expenditures (exports, imports and changes in stocks) and the statistical discrepancy between the production and the expenditure sides of GDP.

10.13 The GRDE starts with the national estimates as control total and these are allocated among regions using appropriate regional indicators.

[13] This part is based on Measuring Gross Regional Expenditures (GRDE) in Philippine presented by Vivian R. Ilarina at the International Workshop on Regional Products and Income Accounts, Beijing, China, 15-19 March 2010.

10.14 The following summarizes the methodology used in the Philippines with the final expenditure approach.

I. Personal Consumption Expenditures (PCE)

1. Scope and Coverage

10.15 PCE includes the final consumption expenditures of individual households, institutional households, and private non-profits institutions serving households.

2. Source of data

10.16 Family Income and Expenditure Survey (FIES) by region which is conducted by the National Statistics Office (for benchmark estimates).

3. Classification

10.17 PCE is classified by item of expenditures namely:

- Food
- Beverage
- Tobacco
- Clothing and footwear
- Fuel, light and water
- Household furnishings
- Household operations
- Transportation and communications
- Miscellaneous expenditures like medical and health expenses, personal care, etc.

4. Estimation methodology of personal consumption expenditures (PCE)

10.18 Some major issues on methodology are summarized below:

Benchmark: Regional distribution of total expenditures from Family Income and Expenditure Surveys (FIES) – serves as indicator to allocate national level estimates.

Annual: Trend extrapolation of regional estimates resulting from modified commodity flow method by region using indicators used on production coming from the GRDP.

Deflator: Consumer Price Index by region (average of all items for each region).

Measurement Issues: The estimation of PCE at the regional level poses limitations for the replication of the methodology used at the national level because of the unavailable data for regional estimates. It is assumed that the distribution of the final expenditures of NPISH is the same as the household expenditure distributions.

II. General Government Consumption Expenditures (GCE)

1. Scope and Coverage

10.19 GCE includes central (or national) government; local government and social security agencies.

2. Data sources

10.20 For national and local government - financial report from the Commission on Audit (COA). For social security agencies – financial report from the Social Security System (SSS) and the Government Service Insurance System (GSIS).

3. Estimation Methodology

10.21 Regional for government consumption expenditures are from the Commission on Audit (COA).

10.22 When data are not available from COA, data on regional program of expenditures from the Department of Budget and Management (DBM) are used.

4. Deflator

10.23 Average Earnings Index – computed at national level is the same index used for all regions. CPIs by region are used for maintenance and operating expenses.

III. Gross capital formation

10.24 Gross capital formation is discussed for each type of assets.

1. Construction

(a) Scope and coverage

10.25 Classified into public construction and private construction:

- Public construction - are construction done by national government, local government, and government corporations;
- Private construction - are residential construction and non-residential construction.

(b) Sources of data

10.26 For public construction: Data include annual financial reports from Commission on Audit, and the Budget of Expenditures and Sources of Financing (BESF) of the Department of Budget and Management (DBM):

10.27 For private construction: Data include report on building permits compiled by the National Statistics Office (NSO).

(d) Estimation methodology

10.28 Regional public construction: Estimated for physical accomplishment of construction put in place.

10.29 Regional private construction: Estimates for residential and non-residential private construction; used the S-curve to estimate percentage distribution of physical accomplishments for the period.

10.30 Deflator: Regional CPI for housing and maintenance provides the regional differentials applied to the composite price index at the national level.

(e) Measurement Issues

10.31 Regional allocation of the sector's output among regions is based on indicator of regional distribution as estimated from the gross valued added of public and private construction;

10.32 Under-coverage for private construction which is based from building permits is assumed to be uniform across regions because there is no data currently available to estimate the under-coverage ratio by region. 5. For public, the national deflator used is used for all regions.

2. Durable equipment

(a) Scope and Coverage

10.33 Durable equipment consists of outlays for new and used capital goods such as machinery and equipment acquired by all resident producers less sales or transfers of used capital goods. It covers machinery specialized for particular industries, general industrial machinery and equipment, transport equipment and miscellaneous equipment.

(b) Sources of data

10.34 Sources of data are:

- For imports of durable equipment: foreign trade statistics compiled by the *National Statistics Office (NSO);*
- For domestic production: census and survey of establishments conducted by the *National Statistics Office (NSO).*

(c) Estimation Methodology

10.35 Estimation is as follows:

- Regional indicators are obtained from the regional pattern of expenditure on equipment which are generated from the establishment census and surveys.
- Deflator – the same deflator is used for national estimates and regional estimates which is the Wholesale Price Index. This assumes that for most capital goods price determination is more a function of the uniqueness of the equipment rather than its geographical placement.

(d) Measurement Issue

10.36 The commodity flow method as applied at the national level estimate cannot be used at the regional estimates since available data for the region cannot fully support the methodology.

3. Breeding stocks, orchard development and afforestation

(a) Scope and coverage

10.37 Breeding stocks refer to outlays on livestock and poultry raised as breeders, draught, milking, layers.

10.38 Orchard development refers to outlays on the cultivation of plantations until they become productive.

10.39 Afforestation refers to cultivation of forest trees in newly created forest areas.

(b) Sources of data

10.40 Sources of data include:

- Bureau of Agricultural Statistics: provide data on inventory of livestock and poultry; cost of production studies on total cost per hectare for the development/maintenance of plantations;
- National Statistics Office: from the Census of Agriculture, data used are ratios of animals used as capital formation and data on total areas devoted to permanent crops.

(c) Estimation methodology

10.41 Estimation of breeding stocks:

- Makes use of indicators on regional data on inventory, and regional prices used for breeding stocks, milking, laying and work animals.
- Uses regional ratios to determine the number of animals used for capital formation which is based on the Census of Agriculture.
- Deflated by regional farm gate prices for each type of animals.

10.42 Orchard development is estimated by making use of indicators on regional data on the distribution of value of production of major plantation crops. Regional distribution of gross value added by region is similarly done.

10.43 Estimation of afforestation:

- Makes use of indicators on regional data on expenditures incurred by private enterprises and government as reported by the Forest Management Bureau (FMB).
- Deflated by regional cost per hectare reforested translated into an index.

4. Changes in Stocks

(a) Scope and coverage

10.44 Change in stocks include**:**

- Materials and Supplies
- Work-in-progress
- Finished Goods

– Goods for Resale

10.45 Change in stocks is also identified in the agriculture and the non-agriculture sector, and the government:

Agriculture:
- Rice
- Corn
- Sugar

Non-agriculture
- Crude
- Petroleum Products
- Trade
- Manufacturing / Other Establishments

Government
- National
- Local
- Government Corporations

(b) Sources of data

10.46 The following data sources are used:

- Bureau of Agricultural Statistics (BAS): Data on quarterly volume f production and inventory of rice and corn at the beginning of each month, wholesale prices of rice and corn;
- Sugar Regulatory Board (SRA): Data on quarterly production, imports, exports, consumption and prices of sugar;
- Foreign Trade Statistics (FTS), NSO: Exports and Imports of Rice and Corn;
- Department of Energy (DOE)- monthly inventory and prices of crude and petroleum products;
- Commission on Audit (COA): Annual data on inventories of national, local government and government corporations.

(c) Estimation methodology

10.47 The following methodology is adopted:

- Regional estimates are done separately for the agriculture and non-agriculture sectors.

- Agriculture estimates use as regional indicators the stocks held by households, commercial and National Food Authority.
- Non-agriculture estimates use as regional indicators the inventory held by industrial and non-industrial sectors particularly the finished goods held by manufacturing, mining and quarrying establishments.
- Deflators:
  - Agricultural inventory: Farm gate prices
  - Non-agricultural inventory: Implicit price index at the national level and distributed into regions using as indicator the CPI.
  -

(d) Measurement issues

10.48 As in the case of durable equipment, estimates of changes in stocks for non-agricultural industries use the establishment based data and household stocks are not adequately captured.

5. Exports and Imports

10.49 In the absence of regional trade flow, net export is derived as a residual item. Hence, net export refers to the combined commodity flows between regions and the rest of the world and the statistical discrepancy.

Chapter 11. THAILAND[14]

11.1 Thailand has a population of 67 people in 2008 and is divided into 7 regions and 76 provinces.

11.2 Gross provincial products (GPPs) are currently compiled by the National Economic and Social Development Board (NESDB) which is independent of the Statistical Office of Thailand.

A. Methodology

I. The top down approach

11.3 The top down approach is practiced by NESDB in the compilation of GPPs. This approach has the advantage that it guarantees the sum of GPPs is equal to GDP. However, as an approximation, it may not reflect fully the actual activities in each province.

1. Method for agriculture

11.4 Data for agriculture in terms of gross outputs and prices are available for each province, however intermediate consumption is available only at the 7 regional levels. Thus value added for each commodity is computed first at regional level. This regional level is then distributed to each province in the region on the basis of its share of output.

(a) Compute value added (VA) of each agricultural commodity at regional level

VA in region i = Gross output in region i - intermediate consumption in region i.

(b) Estimate value added for province j:

VA province j = VA region i * share of commodity of province j in region i.

[14] This part is based on Thailand regional and provincial product presented Jutarat Shompoopun at the International Workshop on Regional Products and Income Accounts, Beijing, China, 15-19 March 2010.

2. Method for all nonagricultural activities

11.5 Value added of each commodity at the country level is distributed to each province by a ratio reflecting the proportion of production of the commodity taking place in the province.

II. The bottom up approach

11.6 Since 2005, ESDB is encouraging each province (excluding Bangkok) to compile GPPs for themselves. NESDB provides guidance in concepts and compilation methodology with respect to GPPs to local agency's staff. Quality of the bottom-up GPPs is improving but NESDB continues to publish GPPs officially using the top-down approach. Provincial economic report can be based on its own compiled GPPs.

B. Other issues

I. Publication

11.7 GPPs compiled and published by NESDB are considered official statistics. They are published 13 months later than the reference rate.

II. Uses of GPP

11.8 Provinces may use their own GPP compiled by the bottom-up approach in their economic reports.

Chapter 12. VIETNAM[15]

12.1 Vietnam has a population of 86 million people in 2009 and divided into 63 provinces. Vietnam adopts a centralized statistical system where Provincial Statistical Offices (PPOs) are under direct authority of the General Statistical Office (GSO). However the compilation of gross provincial products (GPPs) is at the initiative of the PPO, without direct supervision from GSO. Since 1994, annual gross provincial products (GPPs) have been compiled by provincial statistical office (PSOs) on the basis of the methodology issued by the central office (GSO).

A. Methodology

12.2 Similar to calculation at national level, GPPs is based on production method, i.e. value added (PVA) is equal to output less intermediate consumption and GPP = PVA + import duties as output in Vietnam is measured at producer prices instead of basic prices.

12.3 GSO has published an official methodology on GPP to guide the PSOs, and has a program of training for provincial statisticians but until now, it does not have a program to review GPPs GSO as being carried by China or to set up systematic coordination for a national database like a case of Brazil to fill the gap as well as to reconcile differences between the national data and the sum of regional data.

12.4 In Vietnam, GPPs are compiled, published and used by local authorities without clearance by GSO. GPPs have neither been officially approved nor published by GSO. In that sense, GPPs are still considered at the experimental basis.

B. Data sources

12.5 Data collected by GSO to compile annual and quarterly national accounts are sampled to reflect the economic activity in the economy as a whole. Data for by PSOs in some activities may use the data collected by GSO when they reflect the activities of the provinces but in other cases they are collected ad hoc or borrowed by neighboring provinces.

[15] This part is based on Vietnam: Institutional arrangement in GDP measurement of gross provincial products by Nguyen Van Nong presented at the International Workshop on Regional Products and Income Accounts, Beijing, China, 15-19 March 2010.

12.6 Output and value added in constant prices are calculated differently from province to province as there are no producer price indexes at the provincial levels. Thus some provinces continue the old Russian method by using the absolute average price of the past and multiplying it with quantity to get output in constant prices regardless of the changes in quantity and product mixes. Other provinces use price indexes of neighboring provinces.

12.7 Overall, the decentralization of statistical works to the provincial levels, without control by GSO, is driven from the desire of the provinces to have their own data for their own economic planning needs. Besides the weakness in data collection, there also exists political pressure at the provincial levels to show higher economic achievement.

12.8 The weakness of this ad hoc practice is reflected clearly by the fact that the sum of GPPs of 63 provinces is far larger than the national GDP.

(a) In 2005, in current prices the sum of GPPs is larger than 5%, but in constant prices, it is larger by 24%.
(b) In 2005 the growth rate of the sum of GPPs was 2.37 % higher than the national rate and for 2007 it was 2.51% higher.

C. Plan for future development

12.9 For the correction of the unfortunate uncoordinated compilation of GPPs, GSO is planning to implement the following program during the 2010 to 2015 period with the objective to retain the mixture of centralization and decentralization of national accounts:

I. Institutional arrangement

12.10 GSO is in charge of compiling national GDP. In data collection, GSO is responsible for collecting data on output, intermediate consumption and value added of multi-regional units, and allocating them to provinces and cities.

12.11 PSOs are responsible for uni-regional units and for compiling GPPs using their own data in combination with data provided by GSO.

II. Identification of statistical units

12.12 GSO is planning to institute the establishment as a statistical unit. It is the intention of GSO to institute a program to build a register that links establishments and ancillary units to

multiregional enterprises, i.e. establishing a register of resident production units for each province.

III. Publication policy

12.13 GSO is the only office that is responsible for publishing official statistics on both annual and quarterly GDP and GPPs at current and constant prices.

DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
STATISTICS DIVISION
UNITED NATIONS

NATIONAL BUREAU OF STATISTICS OF CHINA

International Workshop
Regional Products and Income Accounts, Beijing, China, 15-19 March 2010
Beijing, China

AGENDA

Monday, 15 March 2010
Morning Session 09:00 am – 12:00 pm

Opening Ceremony

Opening of the workshop and welcoming remarks
National Bureau of Statistics of China
United Nations Statistics Division

Session I: Conceptual framework for measuring Gross Regional Products (GRP) and Income

Measuring GRP and Income on the basis of the 2008 System of National Accounts: defining regional economy; concept of regional residents and regional production boundary; regional statistical units
Presentation by Viet Vu, UNSD Consultant
General discussion

12:00-14:00 *Lunch break*

Afternoon Session 14:00 pm – 17:30 pm

Session II: Methods for regionalization

Bottom-up and top-down methods; allocation of national activities to regions; estimating GRP at constant prises

Michael Smedes, Australian Bureau of Statistics

Provincial and Territorial Economic Accounts: regionalizing GDP by activity, income and expenditure

Arthur Berger, Statistics Canada

Regional accounts and GDP by municipalities in Brazil: data sources, data compilation approaches and measurement issues

Brazil

General discussion

Tuesday, 16 March 2010

Morning Session 9:00 am – 12:00 pm

Session III: Measurement issues

Measuring Gross Regional Domestic Product and Gross Regional Domestic Expenditure

Philippines

Compilation of Gross Regional Product in Thailand

Thailand

Measurement of household and informal sector activities by regions

Malaysia

Measurement of the informal sector by regions through household surveys

Viet Vu

General discussion

12:00-14:00 *Lunch break*

Afternoon Session 14:00 pm – 17:30 pm

Session IV: Institutional arrangements and measurement issues in reconciling regional accounts to national accounts and issues of large economies

China's Annual GDP Account by Production and Income Approaches

Department of National Accounts, NBS

Measurement and institutional arrangement

India

Indonesia

Comments on institutional arrangements

Vietnam

General discussion

Wednesday, 17 March 2010
Morning Session 9:00 am – 12:00 pm

Session V: Round table discussion: Towards the best practice approaches in compilation of Regional Product and Income Accounts

Principles adopted for regional accounts
Appropriate approach to measure GRP (production, income and final expenditure)
Measurement of household and informal sector activities by regions
Methods for data collection and estimation
Institutional arrangement

12:00-14:00 *Lunch break*

Afternoon Session 14:00 pm – 17:00 pm

Session V: Round table discussion: Towards the best practice approaches in compilation of Regional Product and Income Accounts (continued)

Methods for adjusting regional accounts to national accounts
Deflation techniques

Session VI: **Closing**

Briefing on the Regional Programme for the Improvement of Economic Statistics in Asia and the Pacific
Artur Andrysiak, ESCAP

Evaluation of the workshop
Closing remarks

Sessions with Chinese statisticians

Thursday, 18 March 2010
Morning Session 9:00 am – 12:00 am

Session VII: China's Regional GDP Account
Department of National Accounts, NBS
Discussion

12:00-14:00 *Lunch break*

Afternoon Session 14:00 pm – 17:00 pm

Session VIII: Main Practices and Achievements of Unified GDP Account in Zhejiang Province
Zhejiang Provincial Bureau of Statistics
Discussion

Friday, 19 March 2010
Morning Session 9:00 am – 12:00 am

Session IX: Brief Introduction to district and county GDP Account in Chongqing Municipality
Chongqing Municipal Bureau of Statistics
Discussion

Evaluation of the workshop

Closing Ceremony

DEPARTMENT OF ECONOMIC AND SOCIAL AFFAIRS
STATISTICS DIVISION
UNITED NATIONS

NATIONAL BUREAU OF STATISTICS OF CHINA

International Workshop
Regional Products and Income Accounts, Beijing, China, 15-19March 2010
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