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## **Gross regional product (GRP): an introduction**

**Background paper**

# Gross regional product (GRP): an introduction

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## I. INTRODUCTION

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 for 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.
2. Thus GRP in principle can be measured by three approaches: the production approach, the final expenditure approach and the income approach.
3. The production approach requires data on output produced by regional residents and data on intermediate consumption by them; 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.
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 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.
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) and operating surplus (OS) is made. For the household unincorporated enterprises, the production approach must be applied as no distinction between COE and OS is possible. In addition, generally data on components of value added is not as readily available as data on output and intermediate consumption and if intermediate consumption is not available, at least value added coefficients for the base year is available. As a consequence, the production approach is the only practical approach to GRP.
6. Table 1 shows the production approach to GRP. GRP is the sum of value added generated by different economic activities of the region.  $GRP = \text{sum of value added} = 85 + 200 = 285$ . 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 values, 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/ser vices	Exports less imports	Final consumption	Gross capital formation	Total output
Agriculture	5	20	0	75		100
Manufacturing/services	10	80	50	100	50	300
Value added	85	200				
Output	100	300				
Value added ratios	0.850	0.667				

## II. MAIN ISSUES WITH GROSS REGIONAL PRODUCT (GRP)

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.
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.
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 SNA2008 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?

## III. THE CONCEPT OF REGIONAL RESIDENTS AND SUPRA-REGIONAL UNITS

10. Although the SNA2008 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
<ul style="list-style-type: none"> <li>▶ <b>Residents of the national economy:</b> must have a centre of predominant economic interest in the national economy.</li> <li>▶ <b>Extra-territorial organizations:</b> Residents outside of national territory have the national economy as the predominant centre of economic interest.</li> <li>▶ <b>Multi-national enterprises:</b> 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.</li> </ul>	<ul style="list-style-type: none"> <li>▶ <b>Residents of a regional economy:</b> must have a centre of predominant economic interest in the economic territory of the region.</li> <li>▶ <b>Residents of supra-regional territory:</b> Residents have only the national economy as the centre of predominant economic interest; not tied to any particular region.</li> <li>▶ <b>Multi-establishment enterprises with registered local units:</b> <ul style="list-style-type: none"> <li>• Local units in the region will be recognized as establishments.</li> </ul> </li> <li>▶ <b>National industries that operate at many regions</b> (railroad, highway, electricity, ...):           <ul style="list-style-type: none"> <li>• Production will be allocated to the regions</li> </ul> </li> </ul>

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.

<p><b>Key features on centre of predominant economic interest defined by SNA2008 (para.4.10-4.14):</b></p> <ul style="list-style-type: none"> <li>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).</li> <li>b) Government authority is reflected in registration, license, lease requirement, tax payment, royalty payment.</li> <li>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)</li> </ul>
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12. **For the units that have no economic interest in any particular region, it is recommended that they should be treated as supra-regional economies, which are conceptually similar to the extra-territorial organisations in the national economy. This means that they do not belong to any region and as a consequence, GDP of the national economy is equal to GRP of all regions plus GRP of the supra-region.** Similarly to extra-territorial organisations 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 3. Comparison between extra-territorial organizations and supra-regional units**

Extra-territory/extra-territorial organizations	Supra-regional territory/ supra-regional units
<ul style="list-style-type: none"> <li>a) National air-space, territorial waters and the continental shelf lying in international waters over which the country enjoys exclusive rights;</li> <li>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.)};</li> <li>c) Deposits of oil, natural gas etc. in international waters, outside the continental shelf of the country, worked by resident units.</li> </ul>	<p>Similar categories (particularly 1 and 2) can be defined for supra-regional territory, which include those that do not attach to any particular region.</p> <ul style="list-style-type: none"> <li>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;</li> <li>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.</li> </ul>

13. Examples of supra-regional units in a national economy may be an oil field owned by the national government, off-shore national resources controlled by the national government. It might be dams owned by the national economy to produce electricity for sale abroad, like the case in Lao. 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 following in will be added. However, this compilation of regional income may be too demanding in terms of data requirement.

#### **IV. TREATING ANCILLARY LOCAL UNITS AS ESTABLISHMENTS**

14. The 2008 SNA 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.”* (SNA2008, para. 5.14).
15. However, in comparison to the SNA1993, the SNA2008 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 locating in other geographical regions. This change in definition would allow for the collection of production data of local units.
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.”* (SNA2008, para. 5.38).
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 products. (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).
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.

## V. TREATMENT OF NATIONAL CORPORATIONS

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. The following cases are typical in any economy:

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

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. (SNA2008, para. 26.35).*

21. The following solutions may be applied to the cases mentioned in para. 20.

a) A construction company is headquartered in one location but has construction projects or building sites in other regions.	Value added when it is significant of the national corporation 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 formation includes what is expensed there.
c) A pipeline is exploited/utilized by many locations	Value added may be allocated by the share of uses 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.  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.
f) Financial intermediation corporations (such as banks, financial corporations, pension, insurance companies).	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 serve 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.

## VI. Treatment of informal activities

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.
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)**.
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.
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.

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 one of an attempt to measure them using the 1-2 survey method. Readers can consult the ESCAP and other documents on how to measure HUEMs.<sup>1</sup> 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 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 developed so that their contribution to GRPs can be measured reliably over time.

### **Compilation methods: top-down versus bottom-up**

27. **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

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<sup>1</sup> 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*.



would require statisticians to collect data on purely regional units. The top-down method 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 (1995)* prepared by the European Union Statistical Office (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.

28. **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.

### **Institutional arrangement: centralization versus decentralization**

29. 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.
30. 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.
31. 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. Totalling 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.
32. 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 uniregional units are collected with the same systematic and consistent sampling method that meets the need of both national statistical system and provincial statistical system.

### **Deflation of GRP**

33. It is unclear how countries deflate their GRP, whether regional price indexes are used or national price indexes are used. EUROSTAT does not provide explicit recommendations on the deflation of GRP. The US is however using national price indexes, which is not a perfect solution, but provided that prices of a given commodity vary throughout the country similarly or if different, the difference is negligible; then the use of national price indexes is acceptable.
34. Conceptually, however, even 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 making 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. Price index of grain may greatly vary across regions depending on the composition of produced grain output in each region.
35. 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.

### **GRP and regional income**

36. 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 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.

## APPENDIX ON REGIONAL STATISCIAL UNITS

1. 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 SNA2008. 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.
2. 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

<p>A given corporation that has two establishments producing good for sale and a headquarter providing services to their establishments without charges (see below)</p>	<p><b>Old treatment</b> (all costs of headquarter are distributed to main establishment (1))</p>	<p><b>New treatment</b> (Distribution of headquarter output as Intermediate consumption (IC) to all other establishments)</p>																																
<p>Headquarter</p> <p>Establishment 1 (Principal)</p> <p>Establishment 2</p>	<p>Establishment 1 + headquarter</p> <p>Establishment 2</p>	<p>Headquarter establishment (3)</p> <p>Establishment 1</p> <p>Establishment 2</p>																																
<p><b>Data</b></p> <table border="1"> <thead> <tr> <th>Establ. 1</th> <th>Establ. 2</th> <th>Headquarter</th> </tr> </thead> <tbody> <tr> <td>Output: 200</td> <td>Output: 100</td> <td>No sale/revenues</td> </tr> <tr> <td>IC: 100</td> <td>IC: 30</td> <td>IC: 30</td> </tr> <tr> <td>VA = 100</td> <td>VA = 70</td> <td>VA: 15</td> </tr> </tbody> </table>	Establ. 1	Establ. 2	Headquarter	Output: 200	Output: 100	No sale/revenues	IC: 100	IC: 30	IC: 30	VA = 100	VA = 70	VA: 15	<p><b>Old treatment</b></p> <table border="1"> <thead> <tr> <th>Establ. 1</th> <th>Establ. 2</th> </tr> </thead> <tbody> <tr> <td>Output: 200</td> <td>Output: 100</td> </tr> <tr> <td>IC: 100 + 30</td> <td>IC: 30</td> </tr> <tr> <td>VA = 70</td> <td>VA = 70</td> </tr> </tbody> </table> <p><b>GDP = 140</b></p>	Establ. 1	Establ. 2	Output: 200	Output: 100	IC: 100 + 30	IC: 30	VA = 70	VA = 70	<p><b>New treatment</b></p> <table border="1"> <thead> <tr> <th>Establ. 1</th> <th>Establ. 2</th> <th>HQ est. 3</th> </tr> </thead> <tbody> <tr> <td>Output: 200</td> <td>Output: 100</td> <td>Imputed output: 45</td> </tr> <tr> <td>IC: 100+30</td> <td>IC: 30+15</td> <td>IC: 30</td> </tr> <tr> <td>VA = 70</td> <td>VA = 55</td> <td>VA = 15</td> </tr> </tbody> </table> <p><b>GDP = 140 (same as old treatment)</b> <b>With 3 establishments in 3 locations</b></p>	Establ. 1	Establ. 2	HQ est. 3	Output: 200	Output: 100	Imputed output: 45	IC: 100+30	IC: 30+15	IC: 30	VA = 70	VA = 55	VA = 15
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