



Economic and Social Council

Distr.: General
2 May 2016

Original: English

Economic Commission for Europe

Conference of European Statisticians

Group of Experts on National Accounts

Fifteenth session

Geneva, 17-20 May 2016

Item 4 of the provisional agenda

Measuring Global Production

Factory-less goods producers: a challenge to the NA industry breakdown (draft version)

Prepared by Statistics Sweden¹

Summary

The document deals with the new division of products into three categories as introduced in the International Standard Industrial Classification (Revision 4). Intellectual property products which are a new category besides goods and services have characteristics from both production of goods (output can be stored and used later) and services (immaterial). The document suggests a more harmonised treatment of Intellectual Property Products in International Standard Industrial Classification. This can be achieved by grouping all activities leading to intellectual property product output into goods and services in the classifications. The distinction between goods, intellectual property products and services is exemplified by the publishing and printing industries.

¹ Prepared by Michael Wolf: National Accounts Department, Statistics Sweden; michael.wolf@scb.se. The views expressed in this paper are solely those of the author and do not reflect official positions of Statistics Sweden.

I. Introduction

1. The economic development and in particular everything that can be summarised under the heading of globalisation has reshaped the relations between corporations. Within enterprise groups this is an ongoing process since decades and often takes the form of outsourcing. But outsourcing need not only be between domestic and foreign parts of the same group of corporations. It is also used to reduce the costs of production by outsourcing parts to any foreign producer with lower labour costs.

2. The question, besides practical measurement problems, is if the principles of the SNA are enough flexible to take account of these seemingly new relations and if we are able to structure them in a meaningful way to serve the analysis or if there are fundamental needs to modify the SNA. The work done under the supervision of the UNECE points in the direction that it would suffice to make smaller adjustments in the activity classification. But in spite of the thorough work behind the Guide to Measuring Global Production (GMGP) some questions still remains to be straightened out.

3. It has been suggested in the GMGP that the use of intellectual property products (IPP) should be given the same dignity, in the recommendations on outsourcing in ISIC rev. 4, as material inputs have in goods for processing. By that change activities only engaged in R&D and business management would be classified in manufacturing if the product at the end of the global production chain is an output of manufacturing. This is one option we have to discuss but we also have to regard whether this is the intention with the activity classification or if there might be other solutions to the problem put forward which gives similar result as the one proposed in the Guide.

4. A phenomenon which resembles the use of IPP and has implications for the activity classification is when a unit places machinery at the disposal of another unit in order to provide a specific product. Another issue, noticed in the GMGP, is in which activity the unit responsible for the entire production process should be classified. Consequently there are several issues in relation to the activity classification (ISIC) which have been addressed and needs to be discussed in a coherent way.

5. In recent years the globalisation discourse has encountered the old issue of the principal difference between goods and services. This is most evident in CPC rev. 2.1 where a new category has been included in order to separate intellectual property products (IPP)². The consequence of this in ISIC rev.4 has been to move publishing activity from manufacturing to services. But the question has also been raised in relation to the changed recording of foreign trade for example goods which do not change ownership when they pass the border in order to be processed abroad and sent back.

6. Something which should have a subordinated role is ownership but this has, in a sense, become the main issue regarding the activity performed by a unit. It is this relation which has become the target for discussions of factory-less good producers (FGP). So, the solution to the issue of goods sent for processing became an obstacle for issues of more advanced subcontracting like in the case of FGP.

² CPC rev. 2.1, §46 p.11

II. What is the purpose of the activity classification

7. The first question to be asked is of course; what purpose does the division of economic activities into goods and service production and possibly a third category serve? Is it possible and meaningful to make such a grouping of activities? In popular descriptions it is often stated that the advanced industrial nations have left goods production behind as the main source for the national income and instead are dominated by the service industry. In such a context the economies of the world might be divided into those who mainly generate income from areal activities (agriculture, forestry and fishing), mining and manufacturing or service activities.

8. These popular descriptions usually lack the critical distance necessary in order to identify the problems such simplified descriptions are struggling with. One problem is what we can call the problem of homogeneity, i.e. when a unit with mixed activity through outsourcing (within the economy) moves one kind of activity outside the unit. Then in the analysis, part of one category (for example goods) will be moved to the other category (for example services) in the statistics but not necessarily accompanied by an actual change in the composition of the national income. What's happened is that a part of what has been disguised (services within goods production) now is visible in the statistics. The overarching principle that statistics shall be founded on homogenous production units can rarely be realised. Mixed activity is the normal case but the boundary is changing.

9. The second problem is which view we should take on the interdependence between producers in the fabrication of finished products. It is the final output which also in a global perspective is interesting. Sub-contractors and suppliers to the end producers also include producers of investment goods, since these also are intermediary, and contributes to the final output of the production processes.

10. As an example we can consider the services produced by units engaged in wholesale and retail trade. Nobody really demands these services other than indirectly through the goods we regard necessary in order to satisfy our ends and needs. What is then the point of describing the economy as service oriented because a majority gets their income from service activities when these only are provided in order to facilitate production, transport and distribution of goods. Without the fabrication of goods these services would be redundant. But, on the other hand, viewed in a global perspective it can be of interest to know which position an economy has in the international division of labour.

11. It is in the same way with the global production chains, the position different units have in the fabrication has moved from the local to the global and when production is concentrated to a few nodes transports and distribution becomes even more important. In a recent example the production cost of an athletic shoe is only 20 percent of the market price, at basic prices that is. The remaining 80 percent are costs for services like marketing, transport and trade. But as long as productivity increases can offset these costs and more, due to economics of scale, the consumer goods prices can be reduced.

12. Well, maybe it is not our role as compilers of national accounts to question how it is being used to describe the economic development. First and foremost we should assist with transparent and coherent NA data to facilitate different kinds of analyses.

III. The problem

13. The general problem can be described as the relation between the productive activity and its result or output if that's a better phrasing. The question also includes how we should regard copyrights and other intellectual property products (IPP's) and their position in the

classification of economic activities by product. This will be discussed in relation to some cases encountered in recent years.

14. The changed recording of goods for processing abroad raised the question of what kind of product is paid for by sending a semi-finished good and receiving a finished good. It is certainly called a processing service but recorded under the category of goods output, the good which is the normal output of the processing. Thus, we can note two possibilities for defining the activity, either by the output it leads up to which is the standard way of defining the activity, or the activity in itself, but in the latter case the distinction between goods and services becomes meaningless since all activities will be defined as different services.

15. Secondly, the "new" classification of goods and services producing activities as it is presented in ISIC rev. 4 is a step in the right direction. But, it is still unclear what the idea is behind including mass distribution of for example books in the output of publishing activity including computer software. I suspect that in this case it has been a mix up of the actual activity and what in practice is the main source of revenue. Defining an activity by the revenue, what's being paid for, is problematic especially if we want to generalise this to all activities which I will come back to later.

16. In the case of publishing it would probably have been better to restrict the output dimension to only include the activities leading up to the immaterial part of copyright protected output and only include the copyright (IPP) and services in connection to the copyright, for instance by letting others use the copyright. With that material products would be excluded from the output of this activity. The output would in such a case be an immaterial asset which can generate revenue through sales of the asset in all or in parts (licenses and royalties).

17. The problem with such a delimitation lies in the difficulty of splitting the publishing process into several activities and beyond all to identify the production process of copyrights in the same way as have been done for patents (i.e. R&D production process). If we are unable to do this, hardly any units will belong to the industry even if they undertake the activity. The activity of creating IPP is in value terms usually subordinated manufacturing, the activity the IPP is a prerequisite for. If books were not included as output in publishing the most publishers would end up in the manufacturing industry since the value added in book production must cover the copyright costs.

18. The third example relates to the recommendations in ISIC regarding outsourcing. If an enterprise orders goods from a foreign contract producer without placing raw material or semi-finished goods at the disposal of the contractor, then the enterprise (principal) is not part of the fabrication process and should be treated as a trading unit (case of merchanting).

19. But, if the enterprise, on the other hand, buys the input material for example in the same economy as the contract producer is located, without any further processing and puts it at the disposal of the contractor then it is no longer a case of merchanting of goods. The ownership of raw materials and semi-finished goods is of importance for the activity classification of units. In the activity description (input-output relations etc.) of the economy the ownership dimension is usually disregarded but in respect of outsourcing it is crucial.

20. Something which we try to avoid is that units included in the manufacturing value chain are classified as wholesalers or separate management or head office units. In relation to this we have problems with merchanting, i.e. when the patent or copyright holder orders the final good from a foreign sub-contractor, without providing the material input, and exports the good to a third party.

21. Head office activity undertaken within an enterprise is usually treated as ancillary. But if it is undertaken over the borders in an enterprise group it should be recorded as sales of a service. The payment for the service can be hard to identify if it is paid indirectly as part of other transactions. If patents are owned by a foreign subsidiary SPE it might give the impression that the headquarters is only undertaking management activities and is not involved in leasing of IPP. In practice there is no big difference in relation to direct ownership of the patents since the headquarters also administrates and directs the subsidiary.

22. Regarding the past structural changes of enterprises by the establishing of foreign subsidiaries have made the national unit become an international group of enterprise but with the ultimate controlling parent or headquarters having the same role as before. It is relevant to ask if international relations should end up in other conclusions for the classification of units or if we should suppose the same principles as we use for domestic relations? The main question is accordingly; how should we define and delimit different productive activities in the classification or simpler, what is manufacturing?

23. According to the rules governing the activity classification several characteristics should be regarded like; the input of goods, services and other factors of production, the technology of production, the characteristics of output and what the output are used for.³ But according to my opinion the overarching rule is the characteristics of output and regarding the current exceptions made in ISIC it should be the one and only rule. Note that ownership is not mentioned in ISIC as governing the classification work. Ownership is only used in relation to outsourcing and goods sent for processing.

24. One problem with ISIC rev. 4 is the lack of a coherent division of activities leading up to intellectual property products (IPP). A step in the right direction is taken by the identification of information activities but the goal should be to create a cluster of activities producing IPP.

25. The phenomenon which is the starting point in the GMGP is what has been labelled Factory-less Goods Producers (FGP). FGPs are activity units located in one country which have the role of top management in a group of international enterprises and also develops new goods. These units have the double role of being head-offices and R&D units.

26. The research based manufacturer owns patents. When the patents are used by other units this is treated as a leasing activity of the manufacturer and not R&D. While the publisher almost always will be treated as belonging to one and the same activity the research based manufacturing enterprise can end up in one of several heterogeneous industries. This can be understood as an arbitrary order even if the classification work is based on strict activity criteria.

27. But, I will begin with the typical factory-less goods producer, the book publisher. The book publisher will represent the publishing industry in general, which also includes publishing of standard software. Software is one of the areas which in the current activity classification have a somewhat ambiguous position. Even though I use the publishing industry as illustrative example I will be able to make parallels with R&D since the main output is an immaterial asset.

³ Cf ISIC rev.4 §7, p.4 and §144-5, p.30, *Statistical Papers Series M No. 4, Rev. 4*, UN, New York 2008.

IV. The publisher as a factory-less goods producer

28. A factory-less goods producer (FGP) is a producer, located in one region or economy, organizing the production on a national or global scale and contributes to it with R&D etc. and finally sells the output (by invoicing it) without taking physical possession of it. The FGP does not administrate the day to day activities of the subsidiaries or other contract producers.

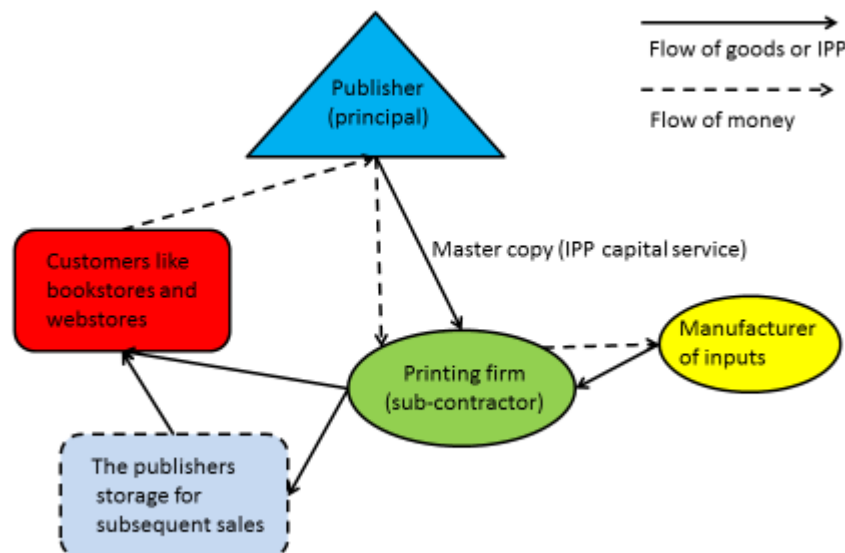
29. The typical example of a FGP is located in the publishing industry, e.g. a book publisher without own printing facilities. The publisher is processing the manuscript from the author and gives the book a graphical design. Altogether this leads up to the book title which by an agreement with the author gives the publisher exclusive right to publish. The publishing right is the commercial copyright and as such the end result of intellectual activity leading up to an intellectual property product (IPP).

30. The publishing right makes it possible for the publisher to make money on the book title by printing and selling books or publish the manuscript as an e-book. The publisher turns to a printing company in order to get the book original (the title) copied and sold to bookstores. The publisher also takes care of marketing partly in cooperation with the author. The activity of the publisher is restricted to making the work by the author accessible to the public.

31. The role of the publisher is to create titles to books, music etc. and to use these for mass production of consumption goods. The book is a good making it possible for the buyer to acquire the story of the author. The story or generally the text is the intellectual property product the author has copyright to. The publisher has by agreement with the author created a special copyright which includes the right to copy and distribute the text. But the manufacturing and sales are undertaken by other units specialised in these areas.

Figure 1

Publishers as FGP



32. Surprisingly, it is not the publishing industry which is the main example of FGP. This is probably due to the fact that the classification of the publishing industry was revised in the latest update of ISIC. This industry is now grouped together with other service providers under the section of information-and communication activities.

33. Goods producers are mainly classified within the manufacturing industry and it is in this segment of the economy FPGs have their origin. By the outsourcing of the production activities these units have become factory-less. This is different from the publishing enterprises which in many cases from the start lacks the printing and copying capacity. The copyright protection makes it possible to separate the production of the original and mass-production without the revenue being hurt. The result of the publishing activity is a copyright protected original which can be multiplied. This is an asset which the publisher has invested in and should in the NA be recorded as GFCF. So far the publisher has only had costs but by copying and selling the copies it hopes to cover the costs and get a surplus.

34. The publishing industry (J.58) has, according to ISIC rev. 4, as output three principally different products. First we have the publishing right to a book etc. which is kind of a copyright. It is this and similar rights which make up the category of intellectual property products (IPP) in the publishing industry. The publishing right nowadays also covers downloadable copies which are included as a service output of the industry. The flow of services only includes copies not distributed from a separate website characterised as a shop. Finally, we have the book as output.

35. The reason for the book to be part of the output in the publishing industry is related to its double purpose. It is a device by which the story including the graphical design can be acquired and at the same time it is a mass produced good. If the goods dimension is emphasised the publishing industry would be part of manufacturing but if we instead, as in ISIC rev. 4, stress the mediating character the publisher will be included in the service producing industry. There is also a possibility to save the publisher in the service industry even if the book is treated as a good in the strict sense.

36. The main output of activities J.58 and J.59 should be copyright protected intellectual property products. These are used as intermediaries to produce goods and services generating revenues to the business activity. The largest part of value added (gross) is created in the sales of books, e-books etc. even though the larger part of the labour force is engaged in creating the publishing right (the title). The publishers are in this sense market producers in spite of the number of employees engaged in creating something for internal use. This is a case where wages and the number of employees as indication of the activity leads in the wrong direction.

V. Outsourcing and ownership of material inputs

37. In the work with 2008 SNA there was some confusion regarding the recording of goods sent abroad for processing. How should the processing service bought abroad be recorded, as imports/exports of a good or a service? One reason for misinterpretation was that service is used in two different meanings; firstly as an activity of transformation and secondly as a category of output.

38. Beyond that, the payment in the case of goods sent for processing, is only for the value of the processing service. Regarding this it also seems to be a service activity. But the breakdown into activities mainly follows the output, the end result of the activity. Regarding goods sent for processing it is unambiguously a good which is the output, for example the processing of crude oil into different petroleum products like gasoline and fuel oil.

39. If we first regard what an activity is we can conclude that each activity consists of different productive services made by labour with the aid of tools, machinery, IPP and other kinds of assets needed to transform the materials and other inputs into the final output of that stage in fabrication. So, in short we can say that the processes of production of any output is conducted by a series of services on the matter under fabrication, creation or transformation.

40. IPP is normally created in the beginning of the production process and used throughout the production and as such occupies the same position as investment goods without being physically deteriorated. But, the value of the IPP will probably decline when output increases. This is certainly the case for the economic value of IPP under patent items since the patent protection is limited in time.

41. Complete outsourcing differs from goods sent for processing in that the entire production process including acquisition of all inputs is transferred to the sub-contractor. Before the German unification in 1991 it was common among Swedish publishers to buy printing services from GDR. The quality was high and prices low. According to ISIC rev. 4 this part of the output should be classified as merchanting since the publishers did not own the material input (cf. figure 1).

42. There is one problem with this conclusion and that is that the book is not the output of the printing activity but of the publishing activity. For this good in particular there is no connection between inputs and outputs in the same activity. The output in the printing activity is an industrial service not a good even though the inputs are paper, printing plates and printer's ink. These inputs seems to evaporate during the process.

43. The publishing activity consists of two very different processes. One leading up to an immaterial asset, the copyright protected original in the form of a title (for a book, a computer game or a software etc.). The other process is to put copies of the original on the market through retailers or as downloadable files. The process step missing is the one in the middle, the very making of the copies to be sold (books, CD-ROM's for computer games and software respectively). This industrial service is bought from other units.

44. In the normal case we would imagine a production process broken down into several steps where each step is undertaken by one or more activity units in the same industry. The publishing industry would in this case be defined as the three activities; production of the original, mass-production of copies, promotion and sales of copies to wholesalers and retailers. If a unit does not undertake all process steps the missing one is outsourced to another unit in the same industry.

45. Regarding what is seen as the output of the publishing industry; originals (IPP) and related services as well as copies (goods) it will be hard to incorporate the publishers in the activity classification. Are they undertaking goods or service production or something in between?

46. ISIC rev. 4 and NACE rev. 2 including the Eurostat manual on outsourcing are noticeable quiet on how the publishers suits in with the description of outsourcing. If it is a service producing activity then, according to the manuals, it does not matter how much or little is being outsourced, the publishers should anyway be classified as publishers and nothing else. But why do they have a good (the book, computer game etc.) as main output if it is a service activity? Well the answer is probably that publishing activity is regarded as information services and the good (the book) is only a mediating link between the publisher and the customer, a medium by which the story is made accessible.

47. If we instead regard the book as a good, in accordance with CPC rev. 2.1, the publishing industry would be part of the activities leading up to goods and included in manufacturing. The problem is that publishers normally do not own the inputs in the

industrial activity, the printing of books. In such a case the manuals are clear on that this is not a case of goods sent for processing since the entire goods production is outsourced.

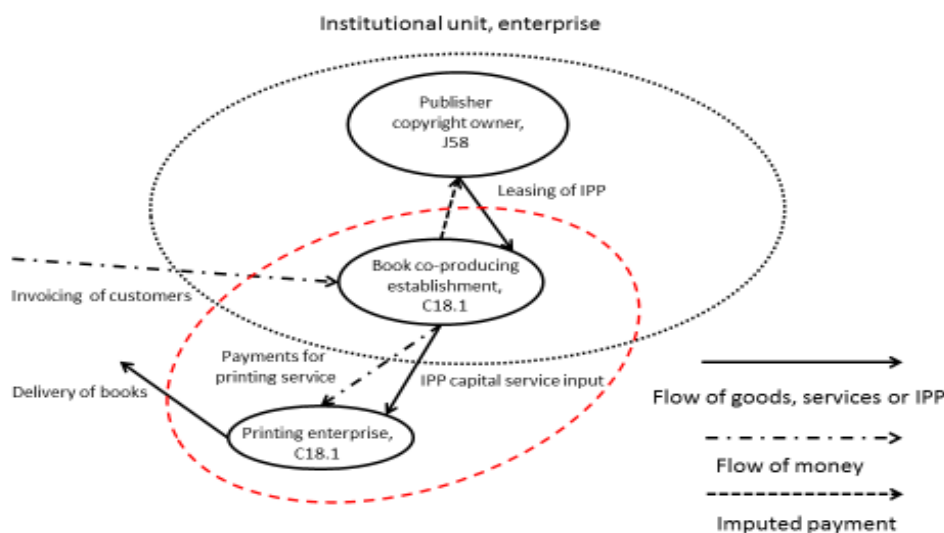
48. A different way of solving the problem with the output of publishers is simply to restrict it to only include the original (the copyright of a book title), publishing on the Internet and copies in electronic form for downloading. Publishing on Internet against payment where the customer only can dispose a copy temporarily can be treated as payment for licenses to use or royalties whereas copies for downloading is a way of arranging factory sales and as such is equal to retail sales.

49. The publishers contribute to their most important source of revenue, sales of books, CD-ROM etc., by putting the IPP at the disposal of the printing and copying industry. This can be treated in at least two different ways. First, we can treat the publisher as a FGP and accept that the printing master (the book title) is input in the printing activity in the same sense as material inputs and the relation will be of the goods sent for processing kind. The publisher will in this case be a manufacturer

50. The other way is more in line with the main principle behind the activity classification. The publisher in its capacity as asset owner, so to say, creates an activity unit included in the industrial process of printing and reproducing. By dividing the enterprise into establishments one part can still remain in the publishing industry. In the case of patents ISIC would treat this as operational leasing of IPP between the establishments. As a parallel to patent we can let the industrial establishment lease the copyright in order to print books. This has the advantage that the book need not be an output of the publishing industry and the net revenue of sales will, nevertheless almost entirely, be compensation for the creation of the original, but indirectly.

Figure 2

Publishers as co-producers



51. The ambition of separating activities leading up to intellectual property products is hard to realise because it is rarely or never these assets which are aimed for sale. In most cases they will be used by the same establishment or other units in the same enterprise to produce goods. Immaterial assets are products used for longer periods but which do not

define the main activity of an industry since the value added is lower in the activity of creating the IPP than in the goods producing activity the IPP is used in.

52. According to the current guidelines the publisher should own the material inputs in order to be classified in manufacturing. The problem with these guidelines is that they focus on one character, the ownership, which in this context actually lacks importance. By the copyright protection no other unit can own and sell the final output, the book. Outsourcing of production, without owning the inputs, makes the principal the owner of the final goods anyway. It is enough to own the copyright (IPP) and fulfil the contractual agreements to have ownership of the goods produced by a contractor.⁴

53. Therefore ownership of inputs has to be viewed as an indication of something else for example that the unit has an overall responsibility for planning, surveillance and directing of the production process and by that is an integral part of manufacturing.

VI. Ownership

54. Ownership is a criterion which normally is not used for the classification of units. Within the social accounting framework it is the activity and its result which is in focus. This means that a productive activity is classified according to the processes used in the activity leading up to the output. If the output takes the form of a processed good the activity is classified accordingly regardless of ownership of the output or inputs.

55. In the case of payment the ownership on the other hand plays a decisive role. What is produced for an anonymous market is owned by the producer (own account production) until the good is sold to a wholesaler or other intermediary before it reaches the customer. The payment in this case is for the entire good. But, if a principal has ordered a good by given specifications it is the principal which has exclusive right to the good if the terms in the contract are fulfilled. The contractor gets less paid because the processing service is valued less than the finished good.

56. But, the manufacturing activity undertaken by the contractor and the own account producer is more or less the same and therefore they should be classified in the same way. The question asked in the GMGP is which role the unit has, which first is contributing with inputs and later uses or disposes of the output, and how it should be classified. Regarding units in manufacturing the attendant question would be; why is ISIC only referring to ownership of material inputs?

57. The reason is probably that we should view the entire production process, from raw materials to the final product, as separated into several process steps, with different producers contributing to the final output. In the case of goods the contribution from a manufacturing sub-contractor to the next process step is expected to be a material input for further processing not a service output like IPP. This is correct except for two circumstances; the ownership of the input and that goods production also presupposes IPP. Ownership of inputs in general could be a sign of a deeper involvement in the production process like taking responsibility for the entire production from IPP and raw materials to the final output.

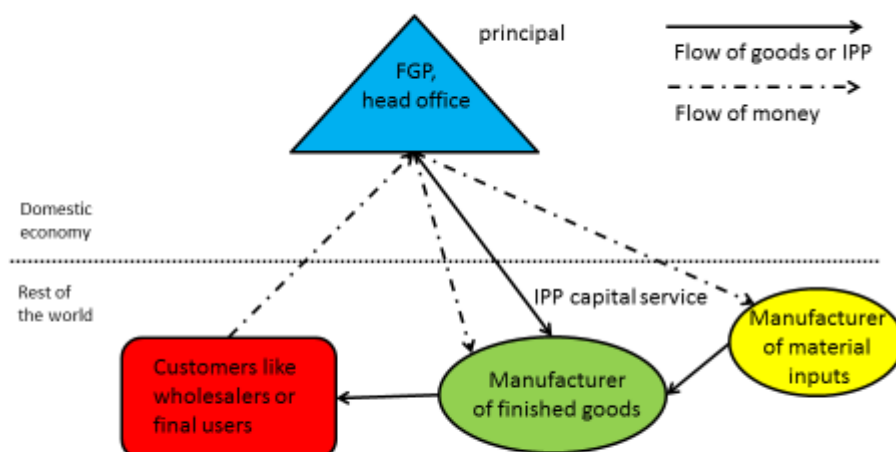
58. Ownership of inputs is not a proof that it also has been produced by the unit or that the unit is responsible for the result. The good can, and this is not unusual, have been bought from another sub-contractor (cf. figure 3). In the petroleum refinery industry it has become rather common to buy crude petroleum and send it to a refinery for processing and

⁴ Cf. GMGP §2.71 p. 20

later store and sell the refined products. If this is made on a systematic basis there is reason to question the owner as taking part in manufacturing. But, in ISIC the condition for being part of manufacturing is formulated as; "if and only if it owns the input materials".⁵ Maybe a different wording like; "if and only if the input materials has been produced on own account" would be more appropriate.

Figure 3

FGP as a manufacturer



59. It is not possible in the long run to ignore the importance IPP, and the services derived from it, has for the classification of manufacturing activities. Otherwise we have to live with the current situation, that an establishment buying the inputs to be processed from a sub-contractor, is classified differently than an establishment which lets the contract producer make these transactions by the principals' specifications (compare figure 1 with figure 3). In reality it is the activity undertaken within the establishment which should decide the classification. Ownership of material or immaterial inputs gives no direct hint to this.

60. Another question which can be put forward is how the principal should be classified when it only supports the contractor with production factors? It can for example be special tools for a specific car model. The tools are necessary in the fabrication but contrary to material inputs the tool itself is not physically consumed and included in the final output. The means of production transfers value to the final output due to their economic deterioration (obsolescence) and the price of the final output is correspondingly lower for the principal.

61. From a principal point of view it is no difference to send a machine or an employee to perform some work at another location. The problem lies rather in the valuation of the service when it is not invoiced separately but only reduces the price paid for the finished

⁵ Cf. ISIC rev. 4, §144 p. 30

product. If the work is performed abroad it would in both cases be export of an (processing) service unless the one-year criterion is met. In such cases a separate direct investment establishment could be created, as a statistical unit in the NA.

62. But it can, with statistical methods, be problematic to measure investments and production for this notional unit in the country it should belong to. All information on this business relation is probably only recorded in the books of the principal. In practice it will be hard to create such notional units and the second best might be to let this part of capital formation be included in the accounts of the domestic enterprise of the principal (compare with the example of a publisher in figure 2)

63. How should we regard the productive service the machine contributes with? An example near at hands is operational leasing but contrary to the concrete processing service performed, leasing is a different kind of service independent of the use of the machinery. In this case it is also relevant to regard when operational leasing becomes financial. Furthermore, there are two important differences. One is that in leasing the interdependence is missing which if present would mean that the lessee only sells products produced with the machine to the lessor. The second difference regards which party is taking the initiative to the transaction. The normal case is that the lessee initiates the transaction by contacting the lessor and not that the lessor forces the manufacturer to use a specific machine it regards necessary for production.

64. It is this interdependence which makes both the owner of the machine and the sub-contractor contribute to the production of the sub-contractor output. According to this we should make the distinction between when the principal supplies the sub-contractor with material inputs or production factors and not if the products supplied are material or not. Leasing as an activity in this kind of relations implies that we should be able to estimate the value of the service and record it as a separate transaction in the NA. But, due to measurement problems, the principle that transactions between establishments should be recorded is normally not followed. This is certainly the case when it comes to the use of patents within enterprises.

65. This means in practice that, only when there exist actual payments, we are able to capture transactions in leasing of IPP and record these as income of a separate activity. The lower production costs by letting of patent “for free” ends up in the value added of the principal including the implicit leasing revenue. So, in this case there is no difference between the letting of a patent and copyright. The problem arises when the activity changes form for example by complete outsourcing of goods production. Then the implicit leasing revenue will instead be attributed to the remaining non-manufacturing activity.

VII. Activity, output and payment

66. The publisher buys the final book from the printing enterprise and sells it to bookstores. Regarding the income from sales one could conclude that the publisher covers the printing costs by selling the book to the public. In this sense it seems that the publisher acts as a wholesaler but nothing can be more wrong. It is actually the work behind the book, by the author and the publishing company which the major part of the price is intended to cover.

67. In ISIC rev. 4 this has been solved in an unconventional way, by letting the book which obviously is a good, be defined as an output in the service industry. This special treatment which so far only includes the publishing industry has to be taken as an expression of the current confusion regarding FGP. The publisher buys a printing service but sells a book, these two activities are far apart in the ISIC classification and therefore we can infer that the publisher has to contribute with something which transforms the input of a

printing service into the output of a book. But it is hard to understand what because the processes are undertaken in the reverse order.

68. In reality the publisher does not transform the printing service into a book and neither does it provide the printing company with material inputs, it only sends the original manuscript together with instruction of how the final copies should be designed (paper quality, cover and binding). The books are produced by the printing company with the original as the master to be copied. How should we explain the difference between a publisher and a cell phone developing enterprise creating a new model which is produced in a low cost economy, when the only input made by a cell phone developing enterprise is to provide the producer with the blueprint and the technical specifications on the components to be used? The activities of the cell phone developer are included in R&D (M72) and computer software/programming (J62). But it is far-fetched that the cell phones should be defined as output of these activities.

69. In table 1 we have summed up the three different characteristics; activity, output and payment, used in classification of market production. There is also a fourth characteristic mentioned in relation to classification, the result or impact (outcome) of the activity. Jean Gadrey argues that it is not possible to distinguish goods from services since the outcome of services has the same properties as goods for example regarding durability.⁶ In this paper we disregard this deeper philosophical discussion of the differences between goods and services and defines services in a negative way as not being goods or IPP.⁷

70. Activity is what we try to grasp and which is the hardest to observe since it is going on within the establishment and is something statisticians rarely or never have complete information about. When it is possible to study the establishment in detail it is costly and can only be defended for large and complex units. Instead it is output (and to some extent input) and payments which are used in the classification work. Both have the advantage of being rather easy to observe.

71. The reason to include activity in table 1 is to illustrate what kind of services are performed by labour with the aid other means of production; machinery, software, R&D etc. That it is service is beyond doubt since when they have been performed they are consumed and not present any more. What is left is either a processed good or for example a change in the condition like in space (transport and communication services) or ownership (intermediation service). The good is moved to the next step in fabrication where other processing services are performed until it reaches the final output stage.

72. As I have indicated, it is meaningless to make a distinction between activities by what is going on at the establishment. All activities would in such a case be classified as services. We therefore have to study the characteristics of the productive services and we do that by moving from the activity towards the output. If we define the activity as a manufacturing service the number of goods and services as output is large. But, by restricting us to only milling of rice, will give a small number of alternatives left, like rice flour. The output of the activity is a good indicator of what kind of activity is performed. The processing technique can be different like manual or mechanical milling but the output is approximately the same. The difference in technique is smaller than the one between rice flour and starches from rice which are output from different 4-digit level activities according to ISIC.

⁶ Cf. Gadrey, Jean 2000 p. 373. Gadrey does not make any difference between output and outcome and concludes that the difference between goods and services do not follow simple criteria like durability and possibility to store. He confuses for example cleaning (to make clean) with cleanliness (being clean). Obviously cleanliness has some durability whereas to make clean does not.

⁷ A positive definition would be that services needs the presence of both the producer and the user.

Table 1
The holy trinity of activity, output and payment

<u>Productive activity (service)</u>	<u>Output (goods, IPP and services)</u>	<u>Payment (goods vs processing service)</u>
A.01.12 Growing of rice	Rice corn, raw (good)	Goods
A.01.41 Raising of cattle and buffaloes	Milk, raw (good)	Goods
B.06.10 Extraction of crude petroleum	Petroleum, raw (good)	Goods
C.10.50 Manufacture of milk and cream	Milk and cream (good)	Goods or processing service
C.10.61 Milling	Rice flour (good)	Goods or processing service
C.10.62 Manufacture of starches	Starches of rice (good)	Goods
C.18.10 Printing and binding of books	Printing and binding <u>services</u>	Processing service (only)
C.19.20 Manufacture of refined petroleum products	Gasoline, fuel oil, gases etc. (good)	Goods or processing service
C.26.30 Manufacture of communication equipment	Mobile communication equipment (good)	Goods or processing service
J.58.11 Publishing of books	Book titles (IPP) and books (good)	Goods
M.72.10 Research and experimental development on natural sciences	Patent (IPP) and R&D <u>services</u>	R&D service
M.74.10 Graphical and other specialised design	Copyright (IPP) and copyright <u>services</u>	Copyright service
N.77.4 Leasing of intellectual property	IPP services	IPP service (royalties and license fees)
R.90.03 Literary and artistic creation	Copyright (IPP) and copyright <u>services</u>	Copyright service

73. The table above describes the differences when an activity is view from three different perspectives, what is performed in the black box the establishment (activity), what is the result of the activity (output) and what does the payment superficially refer to. What we want to grasp is the activity but we are doing this by looking at the output and payments which sometimes can lead us astray. The payment can be for the finished good or only for the processing service. In the table we have only noted this double possibility in a number of typical cases where the processing service is an important output on its own (for example milling and refinery).

74. In many cases it is only the processing service which is being paid for like in the milling industry and refinery of crude oil. According to ISIC this is also the case for the printing industry which has become a strange animal in the classification when the goods output was moved together with to the publishing industry. There is no good output related to the printing industry unless we count goods for internal use in the industry like printing plates. We have to be careful not moving to far away from the activity. When studying what a unit gets paid for this is an obvious risk we take. This problem has become clear within international enterprise groups where the division of labour and internal transactions makes it hard to know what the payments refer to.

75. What would the consequence be of regarding, what the payments superficially is made for, as the output of an activity? This would indicate the general consequence of letting the publishing industry having the book as output. As pointed out earlier the publishing activity leads up to an IPP, a book title or a title of a computer game. The publisher does not sell this asset, but uses it to sell copies and it is the revenue from the copies that will cover the costs.

76. The problem is that the copies are goods whereas the output of the publishing activity leads up to an IPP. This is also the main problem with FGP. They create an IPP, a patent or copyright, which is used by a sub-contractor to produce goods which are sold to cover the development costs etc. The publisher does not own any material input for the manufacturing of books and as a consequence the publisher should be treated as a wholesaler in books. By letting the book be output of the publishing activity this problem is circumvented in ISIC. This solution creates the peculiar situation that the printing activity does not have goods output anymore (cf. figure 1).

77. If we try to generalise this into other areas we will have problems. The activity of fashion houses, design of clothes, but which are buying the clothes from sub-contractors to be distributed and sold in shops and stores should, in the same way as publishers, have the

clothes as output of the design activity, M74.1. The garment industry will then be reduced to produce an industrial service.

78. 78. There will probably always be small enterprises which designs and manufactures clothes for sale. To which activity should these units belong? They also have clothes as output but the design activity is not particularly important and accounts only for a fraction of the production process. Should we accept that the same output can be produced by different activities? Probably not and therefore we once again have to rethink the activity classification.

79. If we extend this parallel to research based enterprises which have completely outsourced the goods production we can have the absurd situation that the output of the R&D activity or leasing of IPP consist of the larger part of the goods list in CPC. These enterprises also get their revenue from sales of goods without producing them. So, what is the difference of producing a container for words and one for goods?

80. It is desirable to group activities in a meaningful way, maybe with the activities creating IPP before production of goods since the creation of IPP precedes manufacturing. It was also according to this logic the order between publishing and printing activities was organised in the previous versions of ISIC.

VIII. Classification of units

81. The problem with FGP is among all which activity/industry they should be classified in. I have argued that the current guidelines which are based on ownership of the inputs or as in the case of publishing where the output is defined by the payments are not possible to generalise. Now it is time to look at the classification rules when an enterprise with different kinds of output is divided into two or more establishments.

82. The main rule of thumb in classification of units is that value added for different kinds of output should be used to decide on the main kind of output and thus the activity the unit is mainly engaged in. The idea is that the work or activity done within the unit is also what the unit get paid for. If it is possible to address different costs to the each of the kinds of products fabricated the value added should give a good picture of the activities undertaken. Value added comprises remuneration to production factors not included in the final output.

83. A good example is an R&D establishment for which we can identify at least two kinds of output; one is the creation of the immaterial output, the IPP (patented or not) and the other is the use of the IPP to create a flow of R&D capital services to the other establishments within the enterprise. As in the case of publishing, the gross value added of the service flow must be the larger of the two, unless the R&D assets (IPP) also in part are sold outside the enterprise (financial leasing).

Table 2
Numerical example, an enterprise with three different activities/establishments⁸

		C29	M72	N77.4
P1	Output	5000	1000	1200
P2	Input, total	3000	200	20
	of which product N77.4	1200		
B1g	Value added, gross	2000	800	1180
D1	Compensation of employees	1000	700	80
B2g	Operating surplus, gross	1000	100	1100
P51c	Consumption of fixed assets	800	50	1000
P51g	Gross fixed capital formation	800	50	1000

84. The main part of the employees might be engaged in the creation of R&D assets (own account production) but the enterprise will nevertheless be a market producer because the value of the assets created is the starting point in the next step, the production of the R&D-service flow which is what the unit gets paid for. This value added (gross) is larger since it covers all labour and capital costs the unit has and not only those related to the creation of the IPP. This implies that, as long as both activities are included in the same establishment, it will be classified to industry N77.4 leasing of intellectual property.

85. But since the two activities R&D and leasing are located in different ISIC divisions it is recommended to split the establishment in two parts, one for each activity. In this way it is theoretically possible to create a unit selling the R&D services to the unit leasing the asset to the end users. In the case of activities creating copyrights, for example publishers, we do not have this problem since both activities, creating the copyright and letting it to others, are included in the same activity subgroup.

86. If the establishment also is engaged in the production of goods based on the R&D assets the classification will be more problematic since we then have to know to what extent the R&D asset is used within the establishment in relation to external use. The problem lies in estimating the value of 'sales' when it is used by other establishments within the same enterprise without any corresponding payments. An example from the car industry could be described as in figure 4a.

87. In practice we do not use value added since it is hard not to say impossible from the official accounts of enterprises to relate input costs to different kinds of output. In order to do this we need additional information which certainly exists within the enterprise but rarely is available for use at NSIs. Instead we focus on wages and number of employees as the main source for the activity classification work. Regarding employment as the main indicator of activity makes the correlation to VA weaker but this can partly be compensated by the advantage of a breakdown into more homogeneous units.

88. A specific problem is the payments for royalties and licenses. The treatment of these has in the activity classification been divided between copyright protected IPP and patented IPP. In the case of copyrights like book titles and software, the revenue of royalties and

⁸ The numerical example supposes zero steady state growth which implies P51g=P51c.

licenses is included in the sales of output of the same activity producing the IPP. The author (active in industry R90.03) gets royalty for the text from the publisher. This is also revenue for the output. It is in the same way for royalties and licenses received by the publisher, they are revenue for the output of the publisher. But, in the case of patented products it is on the other hand a different product, the typical output of activity N77.4 Leasing of intellectual property products (IPP).

89. In this respect the problem is not copyrights, but patents. The owner of a patent, letting someone else use it (leasing of patents), creates a service which is the output of activity N77.4. If the revenues are large enough the unit will be classified into this industry. It is therefore of importance which unit is the owner (lessor) of the patents, the creator, the headquarter or the goods producing unit. The reason for this is that the value added in the leasing of IPP has to cover both the value of the patent and other costs in the leasing activity whereas value added in the R&D activity only has to cover the factor costs of creating the patent. The latter are at the most equal to the value of the patent but never higher.

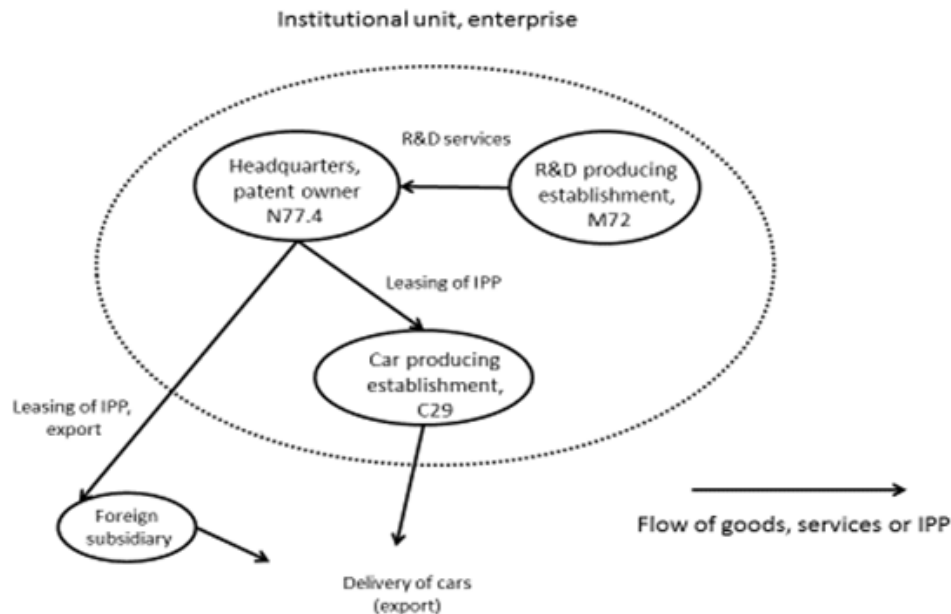
90. When an enterprise is subdivided into establishments of which one is engaged in R&D within the enterprise this establishment will only be classified into industry M72 if it does not use the patent in order to generate licensing revenue. In such a case the establishment is selling R&D services to another part of the enterprise which invests in R&D for example the headquarter (cf. figure 4a)

91. The establishment is a market producer of R&D and belongs to industry M72. In the other case it is producing R&D on own account and earns revenue by leasing it to other parts of the enterprise (and outside customers). The establishment will belong to industry N77.4. If no exception was made for products under copyright then the author, who's main income is royalties, would also belong to this industry.

92. 92. What we in these two cases understand as the main activity, namely R&D leading to a patent, will only be so as long as the unit does produce the patent on own account in order to use it in another activity (leasing). The unit is deemed to be a market producer and uses the output in the production of a different market output of larger average value.⁹ The problem lies probably in the treatment of patents and other IPP as indivisible. Material assets are indivisible in the sense that only one can use them at the same time but this need not be the case for immaterial assets like IPP. It is possible to treat leasing of IPP as sales of part of the asset. That it is partitioned into different parts sold as the rights to use the IPP.

⁹ This is not the case during the creation of a patent portfolio or when the units R&D activity continuously is growing and the R&D activity is in large excess relative to the previous period.

Figure 4a

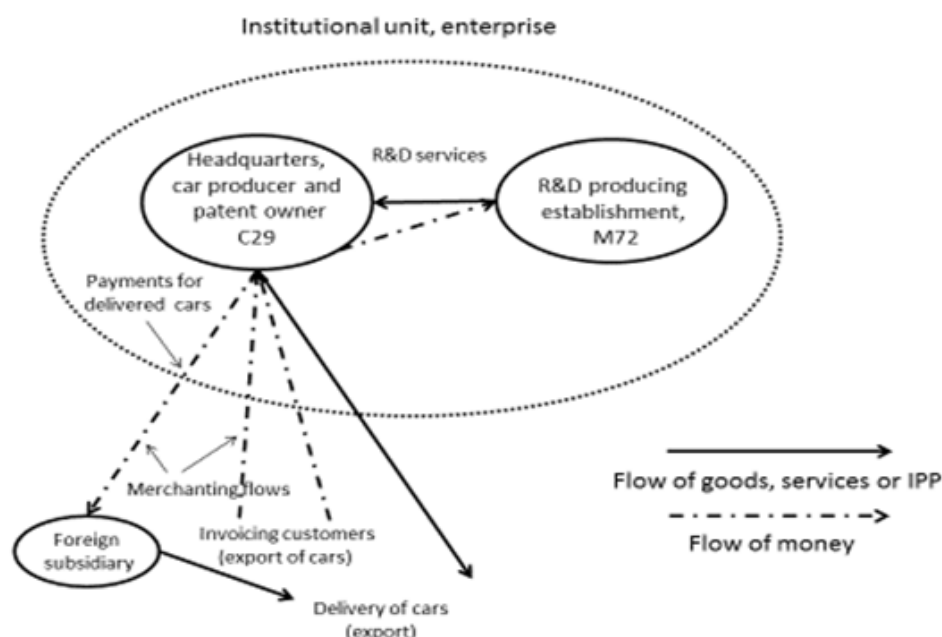
The current model of establishment breakdown based on activities

93. Figure 4a illustrates, in my opinion, the normal case that the current guidelines imply. An enterprise is divided into several establishments classified in different activities/industries. The enterprise in the figure represents a motor vehicle producer with own R&D activity. The establishments are found in industries M72 Scientific R&D, N77.4 Leasing of intellectual property and C29 Manufacture of motor vehicles. The headquarter owns the patents and receives the result from the R&D activity and lets other parts, including foreign subsidiaries, use the patents. The motor vehicles (cars for short) sold are invoiced from the headquarter which also pays the producing establishment for the costs of producing the vehicles. The difference is revenue for the use of patents and other cost of the headquarters in its position as managing the production process (ancillary activity).

94. The R&D activity can be separated either because actual payments are made or by the cost based calculation made in the NA in order to estimate the value of own account R&D. It is also possible that this kind of model based calculations have to be used in other areas in particular when the costs of the activity are not paid directly by buying the service output, but is paid indirectly through revenue for goods sold.

Figure 4b

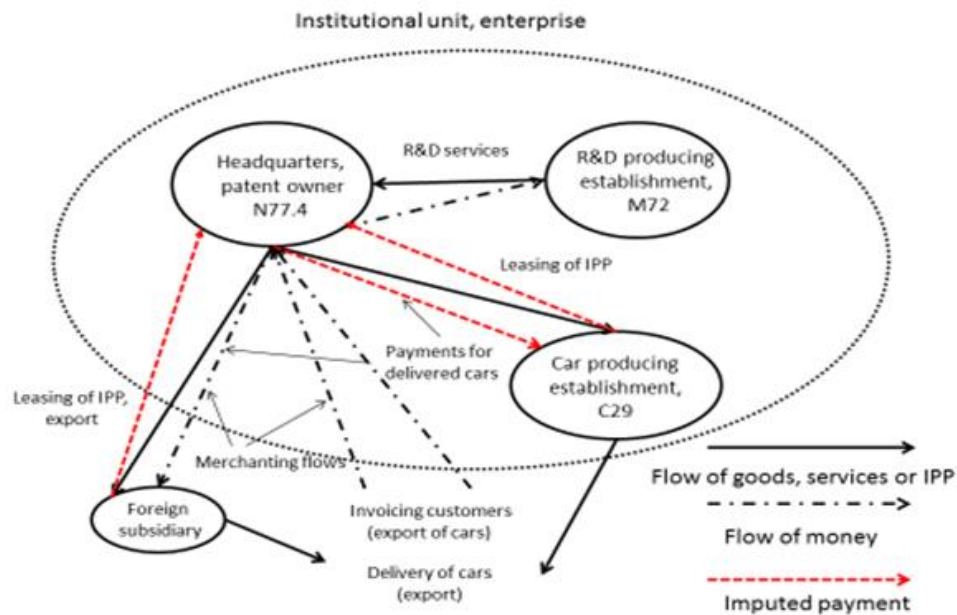
The current model, actual best case based on payments incl. estimated R&D



95. In practice few if any NSI are able to keep up with the theoretical model. The information available is taken from the accounts of enterprises etc. and since no payment is made for the use of patents the revenue will not be recorded separately for this transaction. The cars sold are invoiced by the headquarters which also pays for the actual production costs of each establishment producing the cars. The difference makes up the compensation for using the patents and the other costs related to the ancillary activity of the headquarters. The headquarters is understood as an integral part of manufacturing and is in most of the cases classified as part of the motor vehicle industry.

96. In the best case we are able to split the enterprise in two parts; R&D and manufacturing. In the figure 4b there is a relation with a foreign subsidiary. Since no explicit payments are made for using the patents we have mistakenly interpreted the activity of the headquarters vis-à-vis the subsidiary as a case of merchanting. But as noted in GMGP it is of great importance to note what kind of costs (output) the payments actually refer to. Regardless of what we think of the recommendations in the current ISIC, in order to comply with the great demands on the activity breakdown, we have to make estimates of the magnitude of payments for patents and other services included in the total payments. If we are successful in this, the merchanting flows can be split into its parts, and we will be able to record which activities this kind of indirect payments refer to.

Figure 4c
The current model, ideal case



97. But even if we are successful in our aim there will still be a difference in view between ISIC rev. 4 and the GMGP. The manufacturing of cars is separated in an own establishment as in figure 4a. When the merchanting flows are divided into payments for other services the part related to wholesale will be rather small. The revenue of the headquarters will instead be dominated by license fees for the use of patents (cf. figure 4c). The headquarters owns the patent and will according to ISIC still be an establishment mainly occupied with leasing of patents, N77.4 and not as proposed in the GMGP a motor vehicle producer, in C29.

98. As can be seen in the figure the headquarters pays the R&D establishment for its production and almost all activities circulate around the headquarters (arrows). This is an indication of the headquarters as manager of the production process. According to my view and the one presented in the GMGP the activity of the headquarters should be regarded as part of manufacturing. Given that we can estimate what the payments actually refer to and with that comply with the ideal case. I think it with relatively simple means is possible to close the gap between ISIC and GMGP.

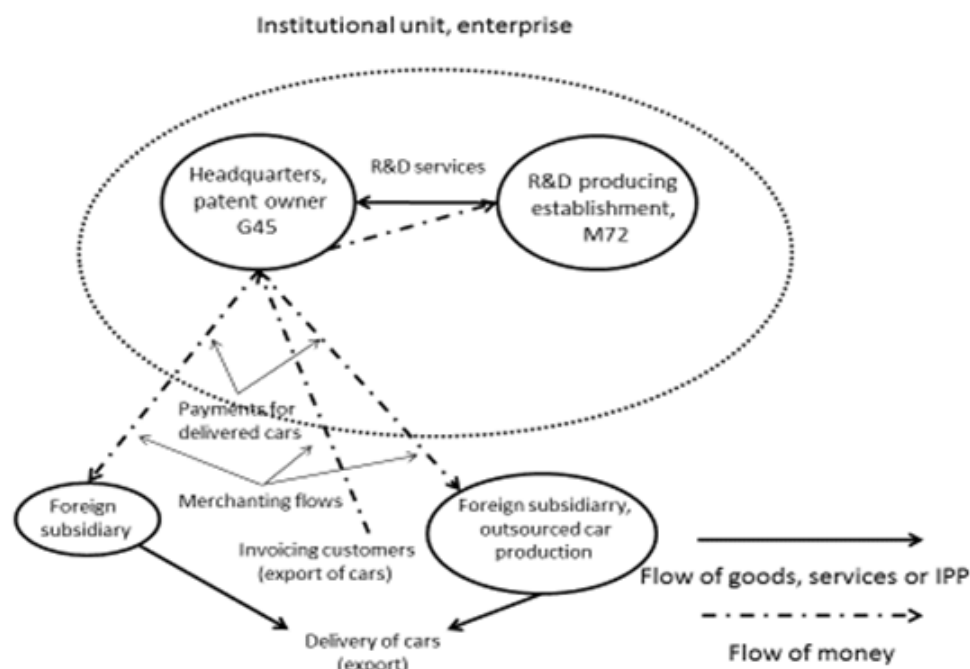
99. When manufacturing, as described in the ideal case (cf. figure 4c), has been completely outsourced the activity of the headquarter will not change, it will still be leasing of patents. If we want it to be manufacturing we have to, as in the cases of publishing (J58) and software (J62), define leasing of product specific IPP to be output in the same activity as the product it is used for. In concrete words this means that leasing of patents for manufacturing motor vehicles should be part of output in the motor vehicle industry. In this way the headquarters which owns and administrates the patents, in the examples, will be included in the motor vehicle industry, C29 instead of in N77.4.

100. But in practice we classify units based on the payments we observe, i.e. as in figure 4b. When the car manufacturing is outsourced to a foreign subsidiary (cf. figure 4c) only the R&D establishment and the headquarters with the patents are left. The headquarters continues to pay the foreign subsidiaries for their output and sells the most of the cars to the rest of the world. This means that the merchanting revenues increases and will be totally dominant. The headquarters will be treated as a unit mainly undertaking wholesale

activities abroad and will be classified as part of the domestic wholesale with motor vehicles industry, G45.

Figure 4d

The current model, the actual FGP case

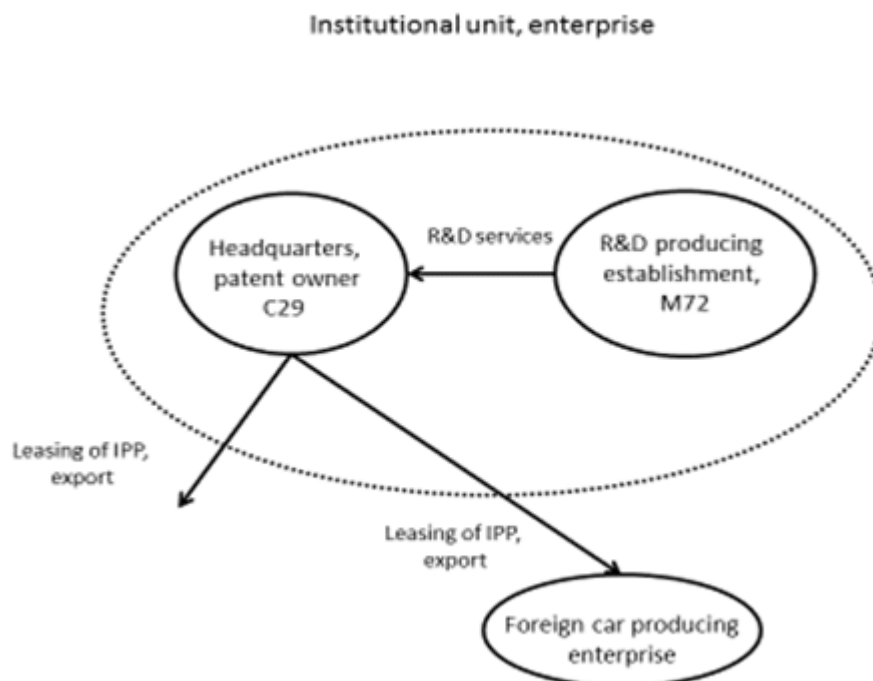


101. The enterprise becomes so to say a wholesaler in its own product, protected by intellectual property rights. This situation has not been foreseen in the NA guidelines, e.g. ISIC rev. 4. My opinion is very much in line with the view of the GMGP, it was not the intention that units should be classified as merchants if they only trade in their own goods and services. This shortcoming in the guidelines has led to the special treatment of these units as undertaking a special kind of trading activity under the heading of merchanting separated from traditional wholesale and retail trade.

102. Besides including the headquarters in an isolated management industry (M70.1) this is the second worst alternative. Leasing of IPP is a more reasonable alternative even though the relation to a concrete manufacturing process is clear. In the GMGP it is emphasised that FGPs are responsible for the IPP input in the activity. In order to have an efficient and competitive production process the FGP directs production to the units with the lowest costs. An FGP is according to GMGP more involved in manufacturing than the traditional headquarters and this should have consequences for classification.¹⁰

¹⁰ Cf. GMGP §§ 2.83 p. 22

Figure 5
The GMGP model, the FGP case



103. In spite of the recommendations in ISIC it is unusual that the main target is leasing of IPP. Maybe an enterprise which has been outstripped by its global competitors but still own important patents will have this as main goal. The activity leasing of IPP need in some way to be further delimited. Maybe, it should only include leasing of IPP created by unrelated units.¹¹

104. In the example 4c we do not make a substantial difference between the FGP and a headquarters. The proposal in the GMGP means that this unit should belong to the same industry as the producing units mainly belong to, including subsidiaries. By that, we consider the character in the global production process the FGP is part of. We do that in approximately the same the way as we consider the headquarters relation in a domestic production process located in a different region but in the same country as the goods producing units.

IX. Conclusion

105. By exploring two cases, the publisher and the motor vehicle manufacturer, I have tried to point to the problems we face when ownership and payments are given a prominent role in the classification work. The differences in treatment of IPP between copyrights and patents leads up to differences in classification which might not be motivated regarding the similarities between these two kinds of IPP. In practice it is hard to follow the recommendations in ISIC in all details. In order to comply with the demands it is necessary to collect more information from multinational enterprises or make model estimations of their flows.

¹¹ In the Swedish NA 2/3 of all output of product group N77 is accounted as produced outside the activity N77

106. Topic to be regarded include:

- In what sense can we use the publishing activity as model for FGP?
- Should IPP activities be group together in a separate section of ISIC?
- What importance should be given ownership in the classification of activities?
- Should leasing only include leasing of products produced by unfamiliar units?
- In what sense is leasing a relevant concept for the use of assets (incl. IPP) outside the establishment of the owner?

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