



SNA 2008 Implementation Issues with the Capitalisation of Research and Development

Robin Lynch (Private Consultant)

Paper Prepared for the IARIW 33rd General Conference

Rotterdam, the Netherlands, August 24-30, 2014

Session 4D

Time: Tuesday, August 26, Afternoon

Summary

Guidance for Member States in the European Union on the implementation of the capitalisation of Research and Development (R&D) in Europe has been released in the form of a manual (EUROSTAT, 2014). Preparation of this manual has raised issues on both concepts and measurement. This paper considers these issues and how the manual deals with them. The paper also considers the main recommendations of the *Handbook on Deriving Capital Measures of Intellectual Property Products* (OECD 2010), and comments on them in the light of the discussion in preparation of the EUROSTAT manual. Finally, the paper discusses the SNA 2008 model for the creation and use of R&D intangible assets, and proposes an alternative model which does not increase the level of GDP from previous standards.

The content of this paper, which draws extensively on the EUROSTAT manual, reflects the views of the author and does not in any way represent the official position of EUROSTAT.

1. Introduction

The performance of R&D leads to the creation of intangible assets. Such intangibles – termed Intellectual Property Products (IPPs) in SNA 2008 - have the attributes of a capital good apart from material substance. An intangible asset lasts a long time, is identifiable and separable, can be owned, and will provide future benefits which determine the current value of the intellectual property. It depreciates in value, but only through obsolescence, not wear and tear.

Intangible assets are not simply a variant on the more usual tangible capital assets of economic theory and the national accounts. They are different in their very nature, and pose different conceptual, methodological and measurement challenges for economists and producers of national accounts.

R&D is defined in SNA 2008 paragraph 6.207 as follows:

Research and Development is creative work undertaken on a systematic basis to increase the stock of knowledge, and use of this stock of knowledge for the purpose of discovering or developing new products, including improved versions or qualities of existing products, or discovering or developing new or more efficient processes of production.

The performance of R&D gives rise to new intangible assets. Given the limited commercial trade in final R&D products, it is usually not possible to measure their value through observation of price and quantities in the market. Most R&D is carried out within an enterprise, for use within the enterprise and so no market price is observable. In cases such as the construction of buildings on own account, it is possible to establish a price for the output by examining the market for similar structures and imputing a value of output. The unique nature of each R&D product determines its value, and the lack of a market in comparable products requires the value of own-account R&D to be estimated through a sum of costs approach.

2. Measuring R&D

ESA 2010 paragraph 3.83 sets out how the output of R&D is measured.

The output of R&D services is measured as follows:

- a) *R&D by specialised commercial research laboratories or institutes is valued at the revenue from sales, contracts, commissions, fees, etc. in the usual way;*
- b) *The output of R&D for use within the same enterprise is valued on the basis of the estimated basic prices that would be paid if the research were subcontracted. In the absence of a market for subcontracting R&D of a similar nature, it is valued as the sum of production costs plus a mark-up (except for non-market producers) for net operating surplus (NOS) or mixed income;*
- c) *R&D by government units, universities and non-profit research institutes is valued as the sum of costs of production. Revenues from the sale of R&D by non-market producers are to be recorded as revenues from secondary market output.*

The performance of R&D, and the use of the resulting asset is the same as that for arts, entertainment and recreation services, as described in paragraph 3.86 of ESA 2010.

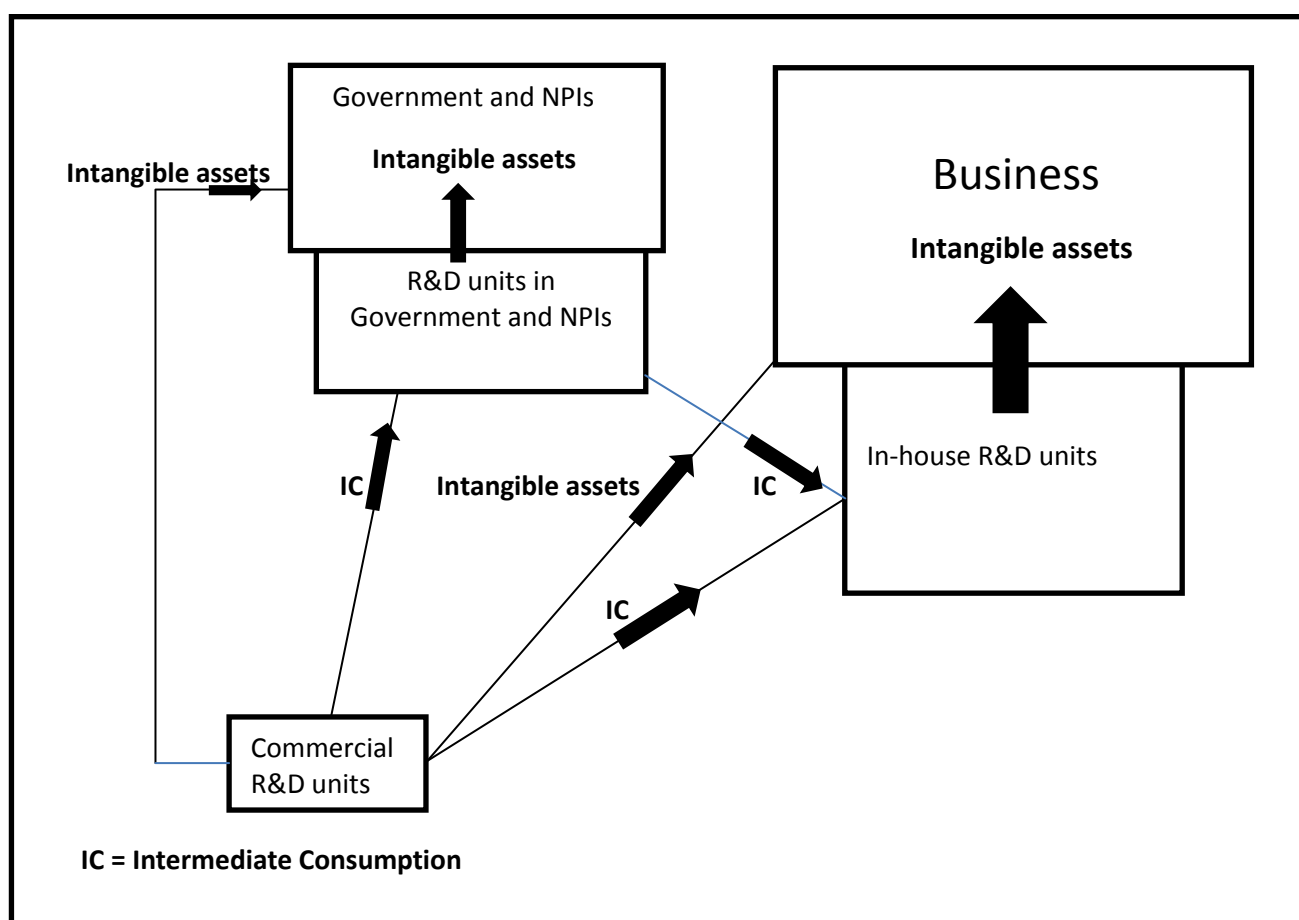
The production of books, recordings, films, software, tapes, disks, etc. is a two-stage process and is measured accordingly:

- (1) *The output from the production of originals – an intellectual property product – is measured by the price paid if sold, or, if not sold, by the basic price paid for similar originals, its production costs (including a mark-up for NOS) or the discounted value of the future receipts expected from using it in production;*
- (2) *The owner of this asset may use it directly or to produce copies in subsequent periods. If the owner has licensed other producers to make use of the original in production, the fees, commissions, royalties etc. received from the licences are the output of services. However, the sale of the original is negative fixed capital formation.*

3. Transactions in R&D intangible assets in the economy

In order to simplify the sometimes complex nature of the creation and use of R&D intangible assets in the economy, the Manual sets out a diagram of how intangible assets are created and traded in the economy. A slightly amended version of this diagram is shown in Box 1 below.

Box 1: Performance of R&D in the domestic economy – amended version of diagram in manual



The performance of R&D occurs mainly in the in-house R&D units of business. Under SNA 2008, wherever possible these units are recognised as secondary units performing R&D and products created are acquired as capital assets by the main business.

Commercial R&D units perform R&D either on contract or speculatively. The majority is on contract, either directly for production business, or through sub-contracts for in-house R&D units.

Where the result of R&D units goes to other R&D units, the diagram shows it being treated as intermediate consumption. The intangible asset created is incorporated as a component in a final R&D product. Where the intangible is acquired by a main production business, it is recognised as a capital asset by the business.

Government and NPI units performing R&D will create intangible assets held by the government and the NPIs, even although these assets are normally freely available.

A relatively uncommon case for R&D (although not for other intangibles such as computer software) is where a commercial unit creates and keeps an intangible asset which it licences out to other units. Then the commercial unit shows the intangible as a capital asset on its own books, and estimates its value through a sum of costs approach. This case is not illustrated in the diagram.

4. Incorporation of intangibles in other intangibles

R&D can be carried out in an activity unit which stands alone, outside an enterprise and recognised as carrying out R&D activity according to the NACE 72 activity code. This is defined as scientific research and development services, and units will typically carry out work on contract for other activity headings. When a unit classified to NACE 72 works as a sub-contractor to another unit performing R&D, there is the possibility of double counting the value of the intangible assets. The intangible created by sub-contracting will not provide capital services to the purchaser, but rather an intangible which will be embedded in the final intangible. An example is the sub-contracting of wing design for an aircraft, and then incorporating that design in the whole aircraft design. If both outputs were recorded as capital formation, there would be a double counting of the value of the wing design. To avoid this, acquisition of the intangible produced by the sub-contractor is recorded as intermediate consumption – as a component of the final product rather than a capital asset which is used up in the process of producing the final intangible, through the provision of capital services.

This is different from the case described in SNA 2008 paragraphs 6.208 to 6.212. In these paragraphs, the model of original and copies is used to propose that an original is used in the process of creating copies which can themselves be intangible assets. The difficulties with this model are explored in the paper “Four loose ends in the International Standards for national accounts” (Lynch, IARIW conference paper, 2014) and the relevant part of this paper is reproduced as an annex to this paper. The annex describes how the originals and copies model introduces confusion between the intangible asset and the means of accessing the asset through a host or access device. Briefly, the SNA uses the term original to describe both the intangible asset, and the master-host used to generate further hosts for the intangible so that the asset may be shared widely through a licencing system. The SNA 2008 model suggests the intangible original value falls through capital consumption in the process of creating copies, but as intangibles do not suffer wear and tear, and the “copying” of the intangible can increase the value of the intangible rather than decrease it through obsolescence, the original and copy model of the SNA results in counter-intuitive outcomes. For R&D, this issue is overcome by allowing the contribution of an intangible to be incorporated as a component part in a new R&D intangible, rather than playing a part in creating it.

A simple example is given in the manual to illustrate these issues. Consider a NACE 72 R&D unit sub-contracting the performance of R&D to a provider, through a contract of value of 10m. The NACE 72 unit employs staff to produce R&D products, and uses existing capital assets in the production process. The total costs will be intermediate consumption of materials, fuels and services, labour costs, and the cost of capital consumption of existing assets. Suppose these costs sum to 100m. Then the acquisition of the sub-contracted R&D will simply add an additional cost of 10m, and the estimate of the value of produced R&D by the contractor will rise to 110m. It is important that the output of the sub-contractor is not recognised as a separate asset, but as a component input to the second contractor so that the value of the contracted-out R&D is successfully captured in the final product and no double-counting occurs. Even where the contracting R&D unit is not sufficiently large or distinct to be separable from the parent enterprise, the principle remains that the contribution of sub-contracted performance of R&D should be treated as intermediate consumption in the commissioning R&D unit, to prevent double counting of asset value.

5. OECD Handbook on deriving Capital Measures of Intellectual Property Products

This handbook was published in 2010, and presents a wide range of discussion, comment and guidance on the implementation of SNA 2008 with regard to the measurement of IPPs in the national accounts.

The OECD handbook key recommendations concerning R&D products are given below.

General recommendations

Recommendation 3

As a general rule, all expenditures on intellectual property products, either purchased or produced on own account, should be recorded as gross fixed capital formation if they are expected to provide economic benefits for the owner. Only in cases where units specialising in producing a type of intellectual property product for sale should acquisitions of that type of product be expensed, or if it is clear that they are completely embodied in another product: for example software copies purchased to be embedded in computers for sale, or other specific information exists such as the existence of a licence with a duration of one year or less.

Comment

Recommendation 3 is consistent with the embedding intangibles in further intangibles when acquired by a unit performing R&D

A2.3.2 Recommendation 8

When summing costs to estimate gross fixed capital formation of intellectual property products, all costs should be included, irrespective of whether the activity is eventually successful or not. Values of assets that subsequently prove unsuccessful should not be written off in the other changes in volume account. Instead they should be depreciated in the same way as similar classes of assets that prove successful.

Comment. This recommendation is consistent with the model used in the Manual to explain why all costs should be summed to estimate the value of intangible assets created – a going concern will look to recoup all costs of performing R&D with both successful and unsuccessful outcomes, through future benefits. So the value of the successful intangible assets will be estimated using all the costs incurred by performing R&D. the results of unsuccessful R&D will not enter the balance sheet, as they will not be recognised as viable through further development of prototypes etc. This approach is consistent with the International Accounting Standard (IAS) 38.

Recommendation 10

When asking units to estimate the cost of producing assets on own account, they should be asked to itemise their costs, separately identifying expenditures on other fixed assets. The latter should not be included in the sum of costs. But estimates of the user cost of capital should be (but only capital consumption for non-market producers). This can be done either by applying the perpetual inventory method to past estimates of capital expenditures or by making an imputation based on data for units specialising in the production of the particular intellectual property product.

Comment. It should be made clear that the fixed capital referred to in this recommendation is only capital used in the performance of R&D, such as buildings, scientific equipment, etc. It should not include intangibles created on sub-contract by other R&D units, which will be incorporated in further creation of intangibles as components.

Recommendation 30

It is very important to distinguish between licences to use for more than a year, and licences to use for a year or less. Expenditures on the former, purchased by production units and not embodied and sold on with other products, are treated as GFCF, while expenditures on all other licences to use are recorded as consumption. Whatever approach is used it is vital that the accurate discrimination between the two should be central to measurement.

Comment. In principle, the terms of the licence dictate the treatment of payments. If the risks and rewards of ownership are transferred to the user, then the payments are for the ownership of the intangible asset, and so acquisition of a capital asset is recorded. If there is no effective transfer of risks and rewards, then the payments are rentals (rents if the intangibles are considered non-produced). Regular annual or shorter period payments usually reflect no transfer of ownership rights, and payments covering a longer period of time suggest ownership transfer.

Key specific recommendations for R&D

Recommendation 16

Ownership of an asset exists when the owner has effective management and control of the R&D output in order to ensure the expected benefits are obtained by the owner. There are more ways of ensuring this than patenting the R&D, for example by publishing R&D in a scientific journal. By doing this, others are prevented from claiming ownership.

Comment. Agreed

Recommendation 17

As a practical solution, when the rights to benefit from the results of R&D are not clearly assigned by intellectual property protection, the owner should be deemed to be the purchaser or, in the case of own account R&D, the owner is deemed to be the producer.

Comment. Agreed

Recommendation 19

As a general rule, all R&D purchased or produced on own account should be treated as gross fixed capital formation by the producer, except when the original is produced for sale (in which case it should be recorded as GFCF of the acquiring unit).

Comment. If it is accepted that creation of intangible assets is production rather than discovery or invention, then this recommendation is agreed. However, if the creation of intangible assets is recognised as not conforming to the SNA definition of economic production, then the creation of the intangible is recorded in the other changes in volume of assets account, and a corresponding non-produced asset recorded in the balance sheet. This was the position in versions of the SNA before the 1993 SNA.

Recommendation 20

Unless specific information to the contrary exists, all expenditures on purchases of R&D or on R&D production by market producers in the Scientific Research and Development industry (Division 72 ISIC Rev. 4) should be recorded as intermediate consumption, or otherwise expensed, on the presumption that such units produce R&D for sale, and any purchases are incorporated in products for sale. Only when specific information is available to the contrary should acquisitions of R&D be recorded as gross fixed capital formation, such as R&D performed by start-ups that do not yet have sales or cases when a unit takes out a patent and sells licences to use.

Comment. This recommendation is a bit unclear, and too restrictive. Why should the final intangible need to be sold? If it is created by a Non-Profit Institution, the principle of embedding will still apply. A simpler and more rigorous version would be:

All units performing R&D should record the acquisition of intangibles created through the performance of R&D by another unit, as intermediate consumption.

The only exception is when the R&D performer does not incorporate the purchased intangible in the performance of further R&D, but instead enters it on the balance sheet as an asset in its own right. An example would be the patenting of a purchased intangible and using it to generate revenue through a short-term licensing system. This activity would not be the performing of R&D, under Activity 72.1 ISIC Rev 4, but distribution of licences under activity 74.40.11

The Handbook Table 3 Summary of steps to derive output of R&D includes in the first line

“Output of licences to use and non-GFCF licences to reproduce”

The commentary column says “Add sales from licences to use and non-GFCF licences to reproduce (i.e. those not satisfying asset requirements).”

This activity comes under activity 74.40.11. It is undoubtedly included in the total output of a unit carrying out such an activity, but is not part of the costs incurred to be included when calculating the performance of R&D output as sum of costs. This line is omitted from the Eurostat equivalent table.

Annex: The recognition of R&D as the creation of an intangible asset

This annex discusses SNA 2008 paragraphs 6.208 to 6.212. The aim of this note is to identify inconsistencies in the model used in SNA 2008 and suggest another model which is based on a paper (Lynch, 2004) submitted to the Advisory Expert Group during development of SNA 2008.

The model used in SNA 2008 Chapter 6 Section 10 “The production of originals and copies” is that Research and Development (R&D) results in an original, and this is followed by a second stage - the production of copies of the original. The sale of copies generates revenue. It is worth repeating here the whole of paragraph 6.208.

The production of books, recordings, films, software, tapes, disks etc. is a two stage process of which the first stage is the production of the original and the second stage the production and use of copies of the original. The output of the first stage is the original itself over which legal or de facto ownership can be established by copyright, patent or secrecy. The value of the original depends on the actual or expected receipts from the sale or use of copies at the second stage, which have to cover the costs of the original as well as costs incurred at the second stage.

Paragraph 6.208 sets out a theoretical foundation for the handling of R&D in the national accounts which generates inconsistencies. There are difficulties, as follows:

- a. It is not clear if the “original” refers to the original concept or the first tangible record of the concept through which the idea can be shared. An example would be for a play – the concept is the complete play as created by the author in their mind, and the first “host” (to use terminology suggested by Hill (Hill, 2014) is the first manuscript to be written by the author – this first record can be called various names in different kinds of R&D – a blueprint, a master, etc. The distinction is critical, as the two possess different economic characteristics, as follows;
- b. The concept is an intangible – with no material existence, and a “public good” to be accessed by a client without detriment to the benefit enjoyed by other clients accessing at the same time. It has the attributes of a capital asset in that it is identifiable and separable, lasts a long time, provides future economic benefits and ownership can be protected through legal acts, secrecy and other safeguards. The concept is not “produced” in the economic sense of the word, and as defined in SNA 2008 paragraph 6.2: “*Production is an activity, carried out under the responsibility, control and management of an institutional unit that uses inputs of labour, capital, and goods and services to produce outputs of goods and services.*” In the case of intangibles, inputs are not purchased, nor is a production activity carried out with an output at the end. The concept is invented, discovered, or created in the mind. Interestingly, the Oxford English Dictionary gives the origin of invent as “from Latin invent- 'contrived, discovered'”;
- c. The first recording of the concept is a tangible good, which may or may not have the characteristics of a capital asset. This record is produced through a process satisfying the SNA definition of production – it requires input of labour, capital and current goods and services. For a play, the author has to write or dictate his concept so that a material record is produced in the tangible form of a script. This record can then be copied and these copies distributed for sale.

So we can see that if by the “original” is meant the original idea, this is quite different from an “original” which is the first material record used to provide access to the idea – the “host” that Hill refers to, the “access device” to use the terminology of Lynch. Note that the concept cannot

be copied – but it can be shared through hosts. On the contrary, the master-host and subsequent hosts can be copied and thus enable the sharing of the concept.

Paragraph 6.208 does not distinguish between these two different uses of the term “original”. It describes the original (original-as-concept) as the output of a first stage, but then refers to the original (original-as-master-host) being used to make copies. Given they are so different in economic character; using the same term to describe the concept as well as the master-host causes difficulties in subsequent analysis.

Paragraph 6.209 describes the creation of the intangible as production, with an equivalent recognition of gross fixed capital formation on acquisition by a user. Under the alternative proposed model, the intangible is discovered and so is a non-produced capital asset, with similar properties to other non-produced assets such as land. It follows that payments for access to the intangible are similar in nature to rent – income transfers for permission to share in the intangible, rather than service payments to pay for use of the intangible. As the intangible is non-produced under this alternative model, it appears in the “Other changes in volume of assets account” rather than as an output in the production account.

Paragraph 6.209 then says that the value of the original may be estimated on the basis of its production costs with a mark-up. But as the original-as-concept has only one cost – the time of the inventor – this valuation is arbitrary. Paragraph 6.209 later accepts that the valuation is arbitrary, stating that the mark up depends on the discounted value of future receipts, “however uncertain”, that determines its [the original-as-concept’s] value.

Paragraph 6.210 then switches from talking about the original-as-concept to the original-as-master-host. Paragraph 6.210 in full is:

The owner of the asset may use it directly to produce copies in subsequent periods. The value of the copies made is also recorded as production separately from the production involved in making the original. Consumption of fixed capital is recorded in respect of use of the asset in the making of the copies in the same way as for any other fixed asset used in production.

This paragraph is a consequence of the lack of clarity in the definition of terms. What is meant by “the asset” of the first sentence? If it is the intangible, then we are faced with the contradiction that concepts cannot be copied; only shared. If it is the original-as-master-host, then this can be copied but this is not the intangible asset itself, it is the master-host being copied to produce other hosts by means of which the concept can be shared.

The second sentence states that “Consumption of fixed capital is recorded in respect of the use of the asset in making copies the same way as for any other fixed asset used in production. . .” But the concept is not “used” to make copies – the concept is the intangible which is being shared by means of the copies – there is no real consumption of the concept in the making of a copy. There can be capital consumption of the master-host and subsequent hosts if these are

classified as tangible capital assets. For example, the performance of a screen-play can be recorded on a master-copy of the film which can be used to generate further copies for sale. In this case, the master-copy satisfies the requirements to be classified as a capital asset and will suffer wear and tear and potential obsolescence “as for any other fixed asset used in production”. But the original concept does not suffer wear and tear, and the only change in value is due to a change in price (obsolescence). This change in price is not due to a decrease in value on the making of a copy of the master-host – indeed the making of a copy can increase the value of the underlying intangible as the concept becomes more popular.

Paragraph 6.211 says

The owner may also licence other producers to make use of the original in production. The latter may produce and sell copies, or use copies in other ways, for example for film or music performances. The copier undertakes production in making the copies. Part of the cost of making the copies is the fee paid by the licensee to the owner or licensor. This fee represents both intermediate consumption of the licensee and output of the owner that is recorded as a service sold to the licensee. The payments made for the licences may be described in various ways such as fees, commissions or royalties, but however they are described they are treated as payments for services rendered by the owner.

46. This paragraph can be re-written, adopting the model of a discovered intangible as a non-produced asset, to be shared through access devices or hosts. Payments for use of the access devices are split between the cost of acquiring the device, and a rent for permission to access the concept:

Alternative paragraph 6.211

The owner may also licence others to produce hosts which give access to the intangible. The latter may produce or sell hosts such as material media enabling sharing of the intangible, or enable access through other means such as the performance of films and stage shows. The creation of the material hosts and the performance of stage shows are production. Payments to the owner of the intangible asset by the producers of the access devices are not payments for the provision of a service, but rather income transfers for permission to access a non-produced asset – the original concept. The payments made for the licences may be described in various ways such as fees, commissions or royalties, but however they are described, they are treated as part payments for acquisition of the host, and part income transfers for permission to access the non-produced intangible asset of the owner.

SNA 2008 paragraph 6.212 states that:

In certain circumstances, the licence to make copies may also be treated as an asset, distinct from the original. The conditions under which this applies and the consequences are discussed in greater detail in chapter 17.

An alternative model of intangibles

The alternative model of how intangible assets should be recorded can be summarised as follows:

- a. Intangibles are not produced according to the definition of economic production adopted for the SNA, they are a creation of the mind, discovered or invented, ;
- b. Intangibles possess all the attributes of a capital asset except material substance, and should be recognised as such in the national accounts, as non-produced assets similar to land;
- c. Their discovery is recognised through new entries in the other changes in the volume of assets account;
- d. Payments for access to the intangible assets are income transfers, analogous to payments of rent for land;
- e. Access to the intangible asset is usually achieved through the production of a master - a host or access device to the intangible. This material device allows others to share in the concept. Copies can be produced of the master record, and the master and copies can be classified as capital assets if they have the standard characteristics of assets;
- f. The master and subsequent copies of the master can be termed “hosts” when they are material, but a more general term suggested is access devices. The performance of a play (the provision of a service) acts as the means of sharing in the original concept, and “access device” seems a more appropriate term than “host” in these cases;
- g. Payments for copies of the master or for a service providing access to the original concept will consist of two parts – a payment of rent for access to the concept, and a payment for the host or access device used to access the concept.

An example will help to illustrate the difference between the SNA 2008 model and the alternative proposed model.

Consider the writing of a play and its performance as both play and subsequently film.

The first act of creation was the author thinking of the dialogue, stage directions, and structure of the play. He then committed these ideas to paper – forming what is referred to in the SNA 2008 as the original. But this term introduces confusion between the idea and the host, to use nomenclature suggested by Hill (Hill, 2014). The idea is the play as thought up by the author; the host is the manuscript which enables the idea to be shared. The script can be copied and distributed to all the producers, directors, actors, stagehands, etc. who are involved in performing the play. This performance is the means whereby the audience is allowed to share in the author’s concept and the performance acts as a “host” to the intangible, although in this case a more suitable term is “access device” following the suggestion by Lynch (Lynch, 2004).

If the play is the turned into a film, we have a performance which is recorded on a host, which can then be used to generate further copies. The first recording of the film can be termed the “master”.

Table 2 SNA 2008 treatment

	Action	SNA description	SNA description of result
The play	Thinking and writing down the play	production	Original – a produced asset
Script copies	Copying	Production	Copies
Performance	Performing, use of theatre	Production of service	Service
Film version	Thinking and writing down screen-play	Production, using capital services from the play as inputs	Original – a produced asset
Film making	Performing, recording etc.	Production of good	Original – a produced asset
Film copy	Copying	Production of good	Copies – tangible assets if sold for repeated use in cinemas
Film show	Show film, use of theatre	Production of service	Service

Table 3 Treatment under alternative proposal

Description	Action	SNA description	SNA description of result
The play	Creative thinking	creation	Non-produced intangible asset
Play script	Writing	Production of a good	Host – tangible asset
Script copies	Copying	Production of a good	Host – tangible asset
Play performance	Performing, use of theatre	Production of service	Means of access - service
Film version	Creative thinking	creation	Intangible asset
Screenplay” and plan	Writing	Production of good	Host – tangible asset
Film production	Performing, recording etc.	Production of good	Host – tangible asset
Film copy	Copying	Production of good	Copies –hosts which are tangible assets if released under long-term licence
Film show	Show film, use of theatre	Production of service	Means of access - service

Table 2 provides an analysis of how the creation and use of ideas in the economy should be recorded in the national accounts under the alternative proposed model - how they are created, and shared through the use of hosts or other means of access.

An essential feature of the model is that the first concept or idea is not *produced* in the SNA sense of production, but is formed through creative thinking and discovery – themselves not economic transactions in the SNA sense. As there are no economic inputs into this process, the result cannot be considered as economic production. From now on the term “intangible” will be used to represent the first result of creative thinking. As there is no production, it follows that the appearance of an intangible of economic value is recorded in the “other change in volume” account, to account for the appearance of an asset of economic value which is not the result of economic production.

It is instructive to consider how the payment to see a play or film is attributed to the providers. Out of a ticket price of 20 euros to see a film, 10 euros may go to the theatre owners, 9 euros to the film producers, and one euro to the concept originator who will also usually be the copyright holder. The 10 euros and 9 euros are payments for provision of services, but the 1 euro to the copyright holder is an income transfer – a form of rent.

The creative thinking that results in an intangible is different from development. Development may be necessary to enable others to share in the intangible through the creation of suitable hosts. Such development can take two forms – development and expansion of the original idea – this is creative thinking and as such not economic production. But if the development is aimed at producing an appropriate host by which the idea can be shared, then such development is economic production.

The use of terms such as originals and copies hinder a rigorous analysis of how intangibles should be treated in the national accounts. There has been confusion between the meaning of “original” as the intangible – the idea – and between the first host to provide access to the intangible. In the model being presented in this paper, the original should strictly only refer to the first concept, and the subsequent recording of it is the “master”, “blue-print” and other such generic terms.

Given that the intangible is the result of creative thinking and not economic production, it follows that the intangible cannot itself provide an economic service after creation. The value of the intangible is transferred to others through sharing – it is a public good in that many people can benefit with no reduction in the benefit to others. In terms of the contribution of intangibles to production, they determine the nature of a production function, rather than provide capital services as part of the production function. This is revealed through the property of intangibles that they do not suffer wear and tear – this would entail the use of the intangible with an associated real service provided. This is exactly equivalent to how the use of land is treated in the national accounts – land does not wear away, and so the use of land is not represented by a capital service, but as a rent – a form of income transfer.

It is interesting to note that the 1968 SNA and 1970 ESA adopted this view for intangibles – it was only in the 1993 SNA and ESA 95 that given the desire to recognise intangibles such as books and computer software as capital assets, the creation of intangibles was taken to be capital formation inside the production boundary, and so provided capital services as any other asset. This view may have arisen because of confusion between the concept and the access device. It is hoped this note will help the analysis to regain a sound analytical basis.

Implications of this alternative model for measures in SNA

SNA 2008 recognises the role of intangible assets, but considers them as a special case of tangible produced capital assets. Payments to benefit from them are treated as service payments for the use of them, rather than income transfers for permission to access them as non-produced assets

Recognising intangibles implies that the value of the access devices should be lowered, as should the value of the capital services taken to be supplied by the access devices.

So recognising intangibles as non-produced assets would not increase the level of GDP, but would introduce a series of income transfers between owner and users of the assets. This would be equivalent to the treatment of copyright payments to authors, as part of the total value of a book.

It is difficult to identify the value of the intangible asset separately from the value of the material assets used to access the concept. However, given the many examples in the computing and electronic communications world where increasingly the payments for the hosts are rent for sharing in the intangible, rather than payment for the cost of the access device. So it is important that the payments are separated into rent payments and payments for the access device, with the underlying asset values for the intangible asset and the hosts shown separately

An example

55. Research is undertaken in the ship building industry to invent a new design of a cargo ship hull. Development expenditure is undertaken and the idea is proven to be viable. At this stage, the research is recognised as the discovery of an intangible asset with predictable economic benefit, and new ships are produced according to the new design. These ships cost about the same as the old design ships, but command a premium due to the revolutionary new shape of the hull which allows faster travel and greater profits.

56. Suppose the price of a ship of the new design is 1.2 million, as opposed to the old-design ship price of 1 million. The new design is protected through patents etc. which will last for 20 years. Given the size of the current and predicted future market for cargo ships, estimates can be made for the value of the intangible (the design) as opposed to the host (the ship).

So whereas only the value of the host would be recognised as capital if intangibles are not recorded in the accounts, the recognition of the role of intangibles would result in the payment for the new design ship to be 1 million for the host and an upfront rent payment of 0.2 million for accessing the idea of the new design. Note that only the host becomes the property of the buyer, the new design concept remains the property of the ship designer and so the payment of 0.2 million reflects the sharing of this idea (an income transfer), not the selling of the idea (a payment for acquisition of a product).

So recognising the intangible non-produced component of the new-design cargo ships would result in:

- a) The measure of production would be lowered, as the sales value would be reduced from 1.2 million down to 1 million;
- b) There would be an increase in income transfers between the purchaser and the patent holder of the new design;
- c) There would be a decrease in the value of capital assets held by the purchaser, matched by an increase in the value of intangible assets held by the patent holder.

This would be a more accurate representation of who owns the assets in an economy.

Bibliography

EUROSTAT. (2014). *Manual on measuring Research and Development in ESA 2010*. Luxembourg: EUROSTAT.

Hill, P. (2014). Intangibles and services in economic accounts. *EURONA*, 59-72.

Lynch, R. (2004). *Original and Copies – A case for retaining the SNA 1993 treatment*. New York: <http://unstats.un.org/unsd/nationalaccount/aeg/papers/m2LynchCommentsOriginals.PDF>.