Tangibles, intangibles and services: a new taxonomy for the classification of output

PETER HILL Economic Commission for Europe

1. Introduction

The distinction between goods and services has been traditionally interpreted by economists as if it were equivalent to a distinction between physical commodities, or tangible material products, on the one hand and immaterial, or intangible, products on the other. The economics literature is full of statements to the effect that goods are material, or tangible, whereas services are immaterial, or intangible. Such statements are casual and conventional rather than scientific, as the nature of an immaterial product is not explained. In practice, intangible products deserve more serious attention because they play a major role in the 'information economy.' They are quite different from services.

This paper examines what are the economically relevant characteristics of goods and services that enable them to be distinguished from each other, usually without difficulty. The distinction is economically important because it marks a fundamental divide within an economy in the ways in which processes of production and distribution are organized. The divergent trends between goods and services industries, such as the slower growth of productivity in services, must be partly attributable to the fact that the nature of service output is such that it is produced and delivered under constraints that do not apply to goods output.

The main thrust of this paper is that the distinction between goods and services has become erroneously and unnecessarily confused with quite a different one, namely that between tangible and intangible products. There is now an extremely important and fast growing class of intangible products in the form of entities that are recorded and stored on media such as paper, films, tapes or disks. Advances in computer, communications and audio-visual technology have greatly enhanced the economic importance of these intangibles. On closer analysis, it emerges that they have all the salient economic characteristics of goods and nothing in common with services. In the global economy their production and distribution are organized in patently different ways from services. Treating them as services not only obscures the real nature and economic significance of intangibles but also causes confusion about the true characteristics of services.

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The habit of describing services as intangible products is an invention of economists. The first part of this paper investigates the origins of this habit and traces its evolution through two centuries from Adam Smith to the so-called Material Product System of national accounting (United Nations 1971). This excursion into the history of economic thought provides useful insights into the nature of the distinction between goods and services. It shows that it was originally linked to discussions about capital formation and the distinction between 'productive' and 'unproductive' labour. While the latter distinction has become obsolete, that between goods and services has not. As the debates between the well known economists quoted in the paper are to some extent quasi-philosophical about the use of language, the authors are left to speak for themselves and are mostly quoted *verbatim.*

The second, and main, part of the paper argues that the traditional dichotomy between goods and services should be replaced by a breakdown between tangible goods, intangible goods and services. This taxonomy not only clarifies the true nature of intangible products but highlights the fact that services are not intangibles. The arguments are briefly summarized here to indicate where the historical debates reviewed in the earlier part of the paper are leading to.

Goods are entities of economic value over which ownership rights can be established. If ownership rights can be established they can also be exchanged, so that goods must be tradable. As goods are distinct entities which are separate from their producers or owners, the production and trading of goods are activities which can be organized separately and carried out at different locations and times. Channels of distribution can be developed with goods changing hands several times. Goods can be consumed or used long after they are produced at locations which are remote from their place of production. This separation of distribution and use from production is not feasible for services.

Most goods are material objects, but goods do not necessarily have to be material or tangible. Intangible *entities* exist which have all the economic characteristics of goods. They are the originals created by authors, composers, scientists, architects, engineers, designers, software writers, film studios, orchestras, and so on. These originals are intangibles that have no physical dimensions or spatial co-ordinates of their own and have to be recorded and stored on physical media such as paper, films, tapes or disks. They can be transmitted electronically. Like material objects, they are separate entities over which ownership rights may be established (and traded) and which may be of considerable economic value to their owners. Originals may be used to produce, or even mass produce, copies which in turn may be used in further processes of production or directly for final consumption. When they are repeatedly used to produce other goods and services, in much the same way as machinery or structures, they must be fixed assets in the national accounting sense (see the *1993 System of National Accounts,* or *SNA).* Their acquisition should count as gross fixed capital formation and their values should be recorded in the balance sheets of their owners.

Intangibles need to be recognized in their own right as a type of good. They have always existed, but their economic significance has increased dramatically because of rapid advances in computer, communications and audio-visual technology which have had a major impact on industries concerned with producing and disseminating information, knowledge and entertainment.

Turning to services, two essential characteristics may be noted. The first is that services cannot be produced without the agreement, co-operation and possibly active participation of the consuming unit(s). The second is that the outputs produced are not separate entities that exist independently of the producers or consumers. Service outputs must impinge in some way on the condition or status of the consuming units and are not separable from the latter (see Hill 1976).

The insistence on services not being separate entities is important. The existence of some kind of relationship and prior agreement between the producer and the consumer may be a necessary condition for service production, but it is not sufficient. Many goods are produced to order: for example, tailor made suits, customized software and most buildings and structures. Unlike services, these are entities which can be traded as desired after they have been produced.

Describing services as intangible goods tacitly assumes that a product must be an entity of some kind, whereas a service typically consists of some kind of improvement to an existing entity.

Services have nothing in common with intangibles, despite the practice of describing them as such. The next section of the paper investigates the origins of this practice in economics.

2. The historical background

2.1 Introduction

Two themes run through the discussions that follow. The first is that, following Adam Smith, the distinction between goods and services was associated with that between ‘productive’ and ‘unproductive’ labour. The second is that, at least for many economists, ‘productive’ did not mean producing a flow of outputs but producing something *capable* of increasing the *stock* of material wealth. Capital formation was elevated almost to the end purpose. The following quotations, however, focus on the specific issue of how the distinction between goods and services came to be equated with the distinction between material and immaterial products.[1]

2.2 Adam Smith

Classical economists recognized that goods have to be *exchangeable*. It was clearly understood that goods must be entities over which ownership rights can be established and exchanged. After the discussion of the pin factory, Adam

Smith observes at the beginning of Chapter II of Book One of *The Wealth of Nations:* "This division of labour, from which so many advantages are derived, ... is the necessary ... consequence of a certain propensity in human nature ... to truck, barter, and exchange one thing for another."

Smith's discussion of services comes much later in Chapter III of Book Two on the "Accumulation of Capital." Its location is significant because Smith was more concerned with capital formation than the production boundary. Smith observes: "There is one sort of labour which adds to the value of the subject upon which it is bestowed: there is another which has no such effect. The former, as it produces a value, may be called productive; the latter, unproductive labour."

Smith continues a little later: "But the labour of the manufacturer fixes and realises itself in some particular subject or vendible *[i.e., exchangeable]* commodity, which lasts for some time at least after that labour is past. It is, as it were, a certain quantity of labour stocked and stored up to be employed, if necessary, upon some other occasion." In other words, the output produced by 'productive' labour can be stored in inventories. In a famous passage Smith goes on:

> "The labour of the menial servant, on the contrary, does not fix or realize itself in any particular subject or vendible commodity. His services generally perish in the very instant of their performance, and seldom leave any trace or value behind them for which an equal quantity of services could afterwards be procured. The labour of some of the most respectable orders in society is, like that of menial servants, unproductive of any value, and does not fix or realize itself in any permanent subject, or vendible commodity, which endures after that labour is past, ... The sovereign, for example, with all the officers both of justice or war who serve under him, the whole army and navy, are unproductive labourers. ... Their service, how honourable, how useful, or how necessary soever, produces nothing for which an equal quantity of service can afterwards be procured.... In the same class must be ranked ... churchmen, lawyers, physicians, men of letters of all kinds; players, buffoons, musicians, opera singers, opera dancers, etc... the work of all of them perishes in the very instant of its production."

While Smith did recognize the importance of consumption, remarking that "... the whole annual produce of the land of every country is, no doubt, ultimately destined for supplying the consumption of its inhabitants," he nevertheless stresses that the output of 'productive labour' can be "destined for replacing a capital, or for renewing the provisions, materials and finished work, which had been withdrawn from a capital; ... Every increase or diminution of capital, therefore, naturally tends to increase or diminish the real quantity of industry, the number of productive hands, and consequently the exchangeable value of the annual produce of the land and labour of the country, the real wealth and revenue of its inhabitants."

Thus, the whole discussion of services took place against the background of capital and capital formation. In current SNA terminology, the outputs produced by Smith's 'unproductive' workers cannot be used to augment the stock of fixed assets, or even be stored in inventories. They can only be consumed. Describing such workers as 'unproductive' was provocative, but Smith did not mean to imply that the 'services' produced by 'unproductive labourers' were not useful or necessary.

2.3 J.B. Say

Smith described commodities as 'vendible' rather than 'material' or 'tangible.' He also did not describe services as 'immaterial' or 'intangible.' This terminology seems to have been introduced by Jean-Baptiste Say in his *Traité D'Econonie Politique* first published in Paris in 1803. Book I, consisting of 22 chapters, was devoted to "The Production of Wealth", chapter XIII being entitled "Of Immaterial Products, or Values Consumed at the Moment of Production".

Say considers the example of a physician who "prescribes a remedy and takes his leave without depositing any product, that the invalid ... can transfer to a third person, or even keep for the consumption of a future day." Say then asks:

> "Has the industry of the physician been unproductive? Who can for a moment suppose so? The patient's life has been saved perhaps. Was this product incapable of becoming an object of barter? By no means: the physician's advice has been exchanged for his fee; but the want of this advice ceased the moment it was given. The act of giving was its production, of hearing its consumption, and the consumption and production were simultaneous. This is what I call an immaterial product."

Say goes on:

> "Smith will not allow the name of products to the results of these branches of industry *[i.e., to the outputs of service industries]*. Labour so bestowed he called unproductive; an error he was led into by his definition of wealth, which he defined to consist of things bearing a value capable of being preserved, instead of extending the name to all things bearing exchangeable value: consequently, excluding products consumed as soon as created. The industry of the physician, however, as well as that of the public functionary, the advocate or judge, which are all of them of the same class, satisfies wants of so essential a nature, that without those professions no society could exist. Are not, then, the fruits of their labour real? They are so far so, as to be purchased at the price of other and material products, which Smith allows to be wealth; and by the repetition of this kind of barter, the producers of immaterial products acquire fortunes."

Say's arguments are compelling but his choice of terminology was unfortunate. In a revealing footnote he says:

> "It was my first intention to call these *perishable* products, but this term would be equally applicable to products of a material kind. *Intransferable* would be equally incorrect, for this class of products does pass from the producer to the consumer. The word *transient* does not exclude all idea of duration, neither does the word

> *momentary*."

In describing services as 'immaterial products', Say's concern is to emphasize that they are 'products' rather than that they are immaterial. He wishes to stress that the workers involved actually produce something of value and cannot therefore be described as unproductive. The term 'immaterial' may have been an inevitable choice in the circumstances, given that Smith's 'productive labourers' produce only material products.

2.4 Nassau Senior

By the mid nineteenth century, the terms 'material and immaterial products' were well entrenched. A good example is provided by Nassau Senior's discussion of the nature of production in his *Political Economy* (Senior, 1863):

> **"Products divided into Services and Commodities --** Products have been divided into material and immaterial, or, to express the same distinction in different words, into commodities and services. This distinction seems to have been suggested by Adam Smith's well known division of labour into productive and unproductive. Those who thought the principle of that division convenient, feeling at the same time the difficulty of terming unproductive the labour without which all other labour would be inefficient; invented the term services or immaterial products, to express its results."

Senior goes on to elaborate the nature of the distinction between a commodity and a service:

> "... the distinctions ... between the producers of material and immaterial products, or between commodities and services, rest on differences existing not in the things themselves, which are the objects considered, but in the modes in which they attract our attention. In those cases in which our attention is principally called, not to the act occasioning the alteration, but to the result of that act, to the thing altered, economists have termed the person who occasioned that alteration a productive labourer, or the producer of a *commodity or material product. Where, on the other hand, our attention is principally called not to the thing altered, but to the act of occasioning that alteration, economists have termed the person occasioning that alteration an unproductive labourer, and his exercises services,* or immaterial products. A shoemaker alters leather, and thread, and wax, into a pair of shoes. A shoeblack alters a dirty pair of shoes into a clean pair. In the first case our attention is called principally to the things as altered. The shoemaker, therefore, is said to *make* or *produce* shoes. In the case of the shoeblack our attention is called principally to the act as performed. He is not said to make or produce the commodity, clean shoes, but perform the service of cleaning them."[2]

Senior concludes thus:

> **"Service and Commodity Discriminated. --** But, objecting as we do to a nomenclature which should consider producers as divided, by the nature of their products, into producers of services and producers of commodities, we are ready to admit the convenience of the distinction between services and commodities

> themselves, and to apply the term *service* to the act occasioning an alteration in the existing state of things, the term *commodity* to the thing as altered; the term *product* including both commodities and services."

2.5 John Stuart Mill

John Stuart Mill, on the other hand, in Chapter III of his *Principles of Political Economy*, (1848), entitled "Of Unproductive Labour," proceeds to defend Adam Smith's distinction between productive and unproductive labour and its underlying rationale. Mill starts by noting.

> "Many writers have been unwilling to class any labour as productive, unless its result is palpable in some material object, capable of being transferred from one person to another. There are others (among whom are Mr. M'Culloch and M. Say) who, looking upon the word unproductive as a term of disparagement, remonstrate against imposing it upon any labour which is regarded as useful -- which produces a benefit or a pleasure worth the cost. The labour of officers of government, of the army and navy, of physicians, lawyers, teachers, etc. ..." These other writers say that such labour "ought not ... to be 'stigmatized' as unproductive, an expression which they appear to regard as synonymous with wasteful or worthless. But this seems to be a misunderstanding of the matter in dispute.... The question is one of mere language and classification."

Mill concedes "that all these kinds of labour [physicians, lawyers, etc.] are productive of utility [as Say argued]" but argues that this is not the issue. The key sentences follow:

> "Production, and productive, are of course elliptical expressions, involving the idea of a something produced; but this something, I conceive to be, not utility but Wealth. *Productive labour means productive of wealth* [italics not in original]. We are recalled, therefore, to the question touched upon in our first chapter, what Wealth is, and whether only material products, or useful products, are to be included in it."

Mill goes on to argue that human capital ought, *in principle,* to be included in wealth. "The skill, and the energy and perseverance, of the artisans of a country, are reckoned part of its wealth, no less than their tools and machinery. According to this definition, we should regard all labour as productive which is employed in creating permanent utilities, whether embodied in human beings, or in any other animate or inanimate objects.... I am still of this opinion." However, he then argues that because 'wealth' is normally understood to refer to material products only, broadening the definition to include human capital would create confusion:

> "While, therefore, I should prefer, were I constructing a new technical language, to make the distinction turn upon the permanence rather than upon the materiality of the product, yet when employing terms which common usage has taken complete possession of, it seems advisable so to employ them as to do the least possible violence to usage. ... I shall, therefore, in this treatise, when speaking of wealth, understand by it only what is called material wealth, and by productive labour only

> those kinds of exertion which produce utilities embodied in material objects."

2.6 Alfred Marshall

Marshall discusses these issues in Book II of his *Principles of Economics* (1890) on *Some Fundamental Notions*. Like Mill, he is concerned about the fact that economics uses terms that are also used in everyday speech. In Chapter I of Book II he argues that the physical sciences can invent new technical terms, but economics has to be "expressed in language that is intelligible to the general public; it must therefore endeavour to conform itself to the familiar terms of everyday life, and so far as possible must use them as they are commonly used" (p. 43).

Chapter II of Book II starts:

> "All wealth consists of desirable things; that is, things which satisfy human wants directly or indirectly; but not all desirable things are reckoned as wealth.... In the absence of any short term in common use to represent all desirable things, or things that satisfy human wants, we may use the term *Goods* for that purpose.
>
> Desirable things or goods are Material, or Personal and Immaterial. *Material goods* consist of useful material things, and all rights to hold, or use, or derive benefits from material things, or to receive them at a future time.... A man's *non-material* goods fall into two classes. One consists of his own qualities and faculties for action and for enjoyment; such for instance as business ability, professional skill, ... All these lie within himself and are called *internal.* The second class are called *external* because they consist of relations beneficial to him with other people. Such, for instance, were the labour dues and personal services of various kinds which the ruling classes used to require from their serfs and other dependents." (pp. 45, 461).

This passage is interesting for two reasons. First, as pointed out by Milgate in Palgrave's *New Dictionary of Economics* (1987, 548), this seems to be the occasion on which the term 'goods' was introduced into general economic usage. As the quotations given above show, earlier economists tended to use the term 'commodity' rather than 'good'. Secondly, although a distinction is drawn between material and non-material goods, the nature of the distinction is quite different from that drawn between material and immaterial *products* by Say and others. Non-material goods as defined by Marshall in the above paragraph are not services.

Marshall then proceeds to discuss the meaning of wealth. He states: "When a man's *wealth* is spoken of simply, ... it is to be taken to be his stock of two classes of goods. In the first class, are those material goods to which he has (by law or custom) private rights of property, and which are therefore transferable and exchangeable." (He then observes *en passant:* "Services and other goods, which pass out of existence in the same instant that they come into it, are, of course, not part of the stock of wealth.") He continues, "In the second class are those immaterial goods which belong to him, are external to him, (such as 'his business and professional connections') and that serve directly as the means of enabling him to acquire material goods." He concludes, "This usage of the term Wealth is in harmony with the usage in ordinary life" (p. 47).

In Chapter III of Book II, he examines production. He observes:

> "And if we had to make a fresh start it would be best to regard all labour as productive except that which failed to promote the aim to which it was directed and so produced no utility. But in all the many changes which the meaning of the word 'productive' has undergone, it has had special reference to stored-up wealth, to the comparative neglect and sometimes even to the exclusion of immediate and transitory enjoyment; and an almost unbroken tradition compels us to regard the *central notion of the word as relating to the provision for the wants of the future rather than those of the present* [italics not in original]. It is true that all wholesome enjoyments [i.e., consumption] ... are legitimate ends of action both public and private; ... But ... the true interest of a country is generally advanced by the subordination of the desire for transient luxuries to the attainment of those more solid and lasting resources which will assist industry in its future work, ..."

Marshall attached one of his lengthy footnotes to this paragraph in which he noted that interpreting 'productive' to mean productive of material wealth can be traced back to the Mercantilists. Marshall comments:

> "Thus the Mercantilists who regarded the precious metals, partly because they were imperishable, as wealth in a fuller sense than anything else, regarded as unproductive or 'sterile' all labour that was not directed to producing goods for exportation in exchange for gold and silver. The Physiocrats thought all labour sterile which consumed an equal value to that which it produced; and regarded the agriculturalist as the only productive worker, because his labour alone (as they thought) left it a net surplus of stored-up wealth. Adam Smith softened down the Physiocratic definition; but still he considered that agricultural labour was more productive than any other."

2.7 J.R. Hicks

Economists in the twentieth century (except some in former Socialist countries) have tended to dismiss the distinction between productive and unproductive labour as irrelevant and obsolete, both goods and services being included within the production boundary. By an unfortunate association of ideas, there may also have been a tendency, at least until the service sector emerged as the largest and most dynamic sector of the economy, also to dismiss the distinction between goods and services as of no great economic significance. One exception was J. R. Hicks. The second chapter of Hicks' *The Social Framework*, (1942) is entitled "Goods and Services" in which he explains that production does not just mean the production "of something material, something you can touch or handle," but also the services produced by doctors, teachers, civil servants, etc. who "count as producers. The things they produce are useful services, not material goods; it is convenient to say that the things produced by producers and consumed by consumers are of two kinds -- Goods and Services, material goods and immaterial services" (pp. 22, 23).

Hicks refers back to Adam Smith's distinction between productive and unproductive labour and comments:

> "The reason why Smith adopted his odd definition of production was because he was impressed by the fact that the production of most goods takes time, often a very long time, and the consumption of these goods comes afterwards. The significant thing about direct services is that the acts of performing the labour and of enjoying the results of the labour are contemporaneous and inseparable. Goods, on the other hand, have to be produced first and consumed afterwards. The production and consumption of services are, practically speaking, instantaneous; but the production and consumption of goods form a process" (pp. 24, 25).[3]

2.8 The Material Product System (MPS)

One legacy of the distinction made by classical economists between productive and unproductive labour, and the associated distinction between goods and services, was the Material Product System of National Accounts used by the USSR and other centrally planned socialist countries until the early 1990s. Following the publication of the 1968 SNA, the Statistical Commission of the United Nations in 1971 approved the counterpart accounting system for centrally planned socialist (or communist) countries entitled *Basic Principles of the System of Balances of the National Economy* (United Nations 1971) but more commonly known as the Material Product System, or MPS. The following quotations from that 1971 document illustrate the philosophy behind the MPS:

> "The principles of the System of Balances of the National Economy set out in this document have been developed on the basis of the Marxist-Leninist theory of social production; ..." (p. iii).
> "All the multiplicity of forms of economic activity in the national economy of a country may be reduced to two main groups or spheres: the sphere of material production and the non-material sphere, or the sphere of services. The character and results of the application of labour in each of these spheres differ substantially" (para. 1.4).
> "The productive character of labour is the criterion delineating the sphere of material production. Productive labour is considered to be labour performed by man in acting on nature to satisfy human needs, i.e. *labour expended on the production of goods*"(para. 1.5) [italics not in the original].

The non-material sphere is said to embrace all activities directed towards rendering services to the population to satisfy personal and social needs people. It "includes services in the field of housing, utilities and household services, in the medical field, and in the educational and cultural fields" (para. 1.6). It is written also that:

> "All fields of productive activity are based on material production, which is primary in comparison with the activities rendering services. The *global product and national income are produced in the material sphere*.... The wealthier a

community is, the more material goods it produces, ... *The non-material sphere creates neither product nor income;* in it takes place only the process of use and redistribution of material goods and incomes produced in the sphere of material production" (para. 1.7) [italics not in the original].

"Services are the results of activities satisfying personal and collective needs, but not embodied in a material product. The features of services are, first, that the time they are recorded is, as a rule, the same as the time they are consumed, and second that the object of application of labour is man himself, while the objects of application of labour in the production of material goods are natural things and natural forces. Services exist only during their rendering and are as a rule inseparable from those performing them" (para. 1.9).

Following ideas expressed by most classical economists, transportation, communications and the distributive trades were treated in the MPS as falling in the material sphere because they were regarded as an extension, or continuation, of the process of producing material goods. On the other hand, financial and most business services, and also real estate services, were treated as falling in the non-material sphere; i.e., as non-productive, even though they can scarcely be regarded as satisfying the "personal and social needs of people."

This accounting system (approved by the Statistical Commission of the United Nations) was in use in large parts of the world until very recently. With such a system production plans and policy targets were mostly framed in terms of the production of material goods, to the neglect of other factors. This influenced, and presumably distorted, the whole pattern of economic growth and development, often with very damaging consequences for the environment.

2.9 The production boundary, goods and services in retrospect

In the last half century, as a result of the work of Hicks, Samuelson, Weitzman and others, it has come to be accepted that the best definition of *income* from a purely theoretical point of view is that it represents "the largest permanently maintainable value of consumption" (Weitzman 1976, 159), at least in a stationary economy. Weitzman begins his paper by remarking: "Economic activity has as its ultimate end consumption, not capital formation. The most complete inference that can be drawn from such a tenet is that investment must be treated as an intermediate good in a multiperiod system whose final products are the consumptions of different years."

Looking back on discussions of goods and services, or commodities and services, up to the middle or end of the 19th century, it is striking how many economists implicitly adopted the opposite view by subordinating flow concepts, such as production or income, to a stock concept, namely material wealth. The maximization of the stock of material wealth took precedence over the maximization of flows of production, income or consumption. Nevertheless, the idea that capital accumulation is only a means to an end was clearly recognized even by those economists who attached importance to the accumulation of material wealth. As noted earlier, writing exactly two centuries before Weitzman, Adam Smith actually observed in his chapter on the Accumulation of Capital (p. 431), that "... the whole annual produce of the land of every country is, no doubt, ultimately destined for supplying the consumption of its inhabitants, ..." Nevertheless, Smith chose to restrict the definition of a 'productive' activity to one which is potentially capable of adding to the stock of material wealth, thereby making the provision of services for immediate consumption 'unproductive'.

Services were therefore singled out by classical economists because the outputs produced were deemed to be incapable of increasing the stock of material wealth. Services cannot be put into inventories because their production and consumption (i.e. provision to consumers) is simultaneous, as Hicks noted. On the other hand, goods have to be produced *before* they can be consumed -- their production and consumption are separate and sequential - so that they *must* enter into inventory, even if only momentarily, after they are produced.

Against this historical background, it is easy to see how goods still tend to be identified with material objects, with services becoming 'immaterial' products more or less by default. One trouble with this scenario, however, is that immaterial products are in fact produced which are patently not services. Somewhat ironically, most of these immaterial products, instead of "perishing in the instant of their creation", greatly enhance the stock of productive capital. Conversely, when the economic characteristics of services and service production are closely scrutinized it emerges that it is quite meaningless to describe them as 'immaterial'. These points are developed in the second part of this paper.

3. A new taxonomy

3.1 Goods

In order to understand the characteristics of intangibles, it is necessary to go back to examine the economic characteristics of goods in general, whether tangible or intangible. The essential characteristics of a good are that it is an entity over which ownership rights may be established and from which its owner(s) derives some economic benefit.

The dictionary definition of an 'entity' is: "a thing that has a real existence; a thing's existence as opposed to its qualities or relations". Ownership is to be understood in its normal sense as the right, conferred by law, custom or tradition, to use or dispose of whatever is owned and to prevent others from doing so, if desired.

Two characteristics of a good are the following:

A good is an entity that exists independently of its owner and preserves its identity through time.[4] If ownership rights can be established it follows that they can also be transferred from one economic unit to another, which implies that goods must be exchangeable: i.e., tradable or vendible as emphasized by Smith and others.

• The owner of a good derives some economic benefit from owning it, in contrast to a 'bad' which has a negative exchange value.

3.2 The production of goods

Goods need not necessarily have been produced as some occur naturally; e. g., mineral deposits. When goods are produced, however, their production has two important characteristics not shared by services.

1) The entire output from a process of goods production is owned by the producer and therefore at the disposal of the producer. Similarly, all the intermediate inputs into the production are owned by the producer. (If there are some additional 'inputs' that are not owned by the producer, such as the shoes repaired by a shoe repairer, the producer cannot own all the 'outputs', in which case the producer is engaged on some kind of service activity.)

2) The use or disposal of a good by its producer is a separate activity from its production and takes place afterwards. A good may be sold, bartered, given away or used for purposes of own consumption or own fixed capital formation by its producer. Alternatively, if it is not used or disposed of in one of these ways, it may be stored in inventory. Even if a contract of sale is agreed in advance, the actual transfer of ownership cannot take place until the good exists; i.e., has actually been produced.

The separability of the production and the disposal, or use, of goods is economically important. Most goods may not only be produced and then stored for use at a later time, but may also be transported (or transmitted) from one location to another. The ownership of goods may also be exchanged more than once thereby opening up a role for specialized distributors to operate between the original producers and eventual users of goods. These familiar characteristics of goods need not be laboured.

3.3 Intangible goods

Most goods are material objects. However, other kinds of *entities* exist which have all the economic characteristics of goods. These consist of intangible entities originally produced as outputs by persons, or enterprises, engaged in creative or innovative activities of a literary, scientific, engineering, artistic or entertainment nature. Broadly speaking, the original intangibles consist of additions to knowledge and new information of all kinds and also new creations of an artistic or literary nature. As originals are heterogeneous it is useful to list some of the main kinds:

-- the text of a new book produced by its author, whether intended for literary, scientific, educational, or other purpose;

-- a new musical composition;

-- a new film produced by a film studio or a new recording of a musical performance;
-- the formula for a new chemical or genetic product or process;
-- the plan for a new building or other structure produced by an architect or engineer;
-- the blueprint for a new machine, vehicle, aircraft or other equipment;
-- the blueprint for a new method of production; a new design for a fabric or clothes;
-- a new computer programme.

An original may be produced by a single person working alone, such as an author, composer or inventor, or by a group of people. The production of an original is often a lengthy and costly process. Contrary to Adam Smith's assertion, musical, stage or sporting productions no longer need "perish in the very instant of their performance" thanks to modern technology. The activities by which originals are created are explicitly recognized as falling within the production boundary in the 1993 SNA.

Originals have to be recorded and stored on some medium such as paper, films, tapes, disks, etc., in a form which can be read or used by persons or machines, but the originals must be distinguished from the physical objects on which they are recorded. When people buy a best selling book, they are buying the story and not just a quantity of paper. Originals are entities which exist independently of their creators and the medium on which they are recorded. They can usually also be recorded on more than one kind of medium: for example, text can be recorded on paper, film, tape or disk.

Once an original has been recorded, it is possible to produce as many copies as required, the cost of producing each copy usually being negligible compared with the cost of producing the original. When the original is copied onto a blank tape or disk, nothing material is transferred in the process. The physical structure of the surface of the blank tape or disk is changed, but nothing is added. This illustrates the fact that originals are essentially immaterial, or intangible, goods. The original is not consumed, or used up, in order to produce copies in the way that material intermediate inputs are consumed in processes of production.

Whereas the copies on which the originals are recorded are objects, the originals themselves, like ideas or information, have no physical dimensions or co-ordinates. Nothing is moved physically when an original is copied or transferred onto blanks, the process being quite different from the transportation of material goods. Copies need not even be produced in proximity to the document, tape or disk which is being copied. The contents of a tape or disk in one location can be transmitted by satellite to another tape or disk on the other side of the world. Whatever is being transmitted is not a material object.

The books, films, tapes or disks onto which original intangibles are copied are, of course, ordinary material goods. The process of producing copies, such as printing books or CDs, is also, of course, an ordinary production process. The copies may pass through wholesale and retail distribution channels in the same way as other goods. After they have been acquired by their eventual users, they may be used for purposes of either further production or final consumption. As the copies are typically used repeatedly, they are evidently either producer or consumer *durables*, depending on how they are used.

When a film is produced by a Hollywood studio, for example, the first copies of the original are usually sold or rented to cinemas who use them repeatedly to produce services for the public. These copies are producer durables and count as fixed assets if they are used for longer than a year. Subsequently, video copies may be sold to the public for home use. These are consumer durables. Copies of word processing or other computer programmes may be used as fixed assets by businesses or as consumer durables by households.

The creation of an original does not always imply that large numbers of copies have to be produced and marketed as just described. When the original is the formula for a new drug, the design or prototype for a new machine, the development of a new production process, etc., the number of potential users may be relatively small. In the case of the plan of a new building produced by an architect, only one or two copies may be needed.

An original is the archetypal immaterial good. It is a *good* because it is an *entity* over which ownership rights can be established and which is of economic value to its owner. It is also *intangible* because it has no physical dimensions or co-ordinates in space. The producer of the original is its first owner, but the ownership may be transferred to another economic unit. The ownership right is often legally recognized through a copyright or patent, but the copyright or patent is only a legal instrument which should be clearly distinguished from the entity over which the ownership right is established, in the same way as the deeds of ownership are obviously very different from the house or property to which they relate. The original intangible can be bought and sold as often as required. Intangibles can be traded and retraded in the same way as material goods.

Ownership of an original means that the owner has the right to exclude others from using it except those to whom permission is specifically granted, usually in exchange for a payment. It has the same meaning, therefore, as ownership of a material good. It is well known, however, that although ownership rights over intangible originals, often described as intellectual property rights, may be clearly defined by law, at least within particular countries, they may be difficult to enforce in practice when it is easy and cheap to make copies.

The value of an original stems from the use to which it is put, either for purposes of producing other goods and services or for final consumption. A typical scenario is as follows. The first step is to record the original on some suitable medium. The next step is to produce as many copies as may be required which are then sold or rented to other units. The final stage is the use of the copies for purposes of production or consumption.

Once an original has been created, it must be treated as a fixed asset if it is used over a long period of time to produce copies. According to the 1993 SNA (para. 10.7) “fixed assets are defined as produced assets that are themselves used repeatedly, or continuously, in processes of production for more than one year.” Many intangibles of the kind under consideration here easily satisfy this criterion.

Originals have some of the characteristics of public goods. In particular, there is no rivalry in their consumption. The use of an original to produce one copy does not reduce the scope, in a purely technical sense, for using it to produce others, although it may reduce the demand for further copies. Similarly, the use of a chemical formula or engineering design by one producer does not reduce the scope for others to use it. Originals have infinite lives. They are fixed assets for which there is no wear and tear, but they may become obsolete and therefore subject to depreciation.

An original is not a public good, however, in the sense that providing it to some users does not necessitate providing it to everyone, whether they want it or not. Otherwise property rights could not be established. Legally, the owner of an original has the right to exclude, or prevent, people from using it, even though copies may be produced illegally.

3.4 Services

Services involve *relationships* between producers and consumers. There cannot be a producer without a consumer. A service must be provided *to* another economic unit. The idea of one unit acting for the benefit of another is inherent in the concept of a service as understood both in ordinary speech and economics. As emphasized by Mill and Marshall, economists risk causing confusion, among economists as well as the general public, if they take a term that is widely used in ordinary speech and use it in an unfamiliar way. Unfortunately, Say did just that in describing services as ‘immaterial products’ as this is a contorted and artificial way of describing a service only explicable in the context of Say’s desire to refute Smith’s assertion that all products have to be material.

In contrast to a good, a service is not an entity that can exist independently of its producer or consumer and therefore should not be treated as if it were some special kind of good, namely an ‘immaterial’ one. As argued in a previous paper (Hill 1976), the best general, or multi-purpose, definition of a service is that it is some *change* in the condition of one economic unit produced by the activity of another unit. Many services consist of *material* changes in the persons or property of consumers, such as haircuts, surgical operations or the repainting of houses, which it is wholly inappropriate, and misleading, to describe as ‘immaterial’ just because no new entity is created.

The outputs of service producers are measured in units such as haircuts, appendectomies, passenger or ton miles, etc., all of which describe changes in the persons or property of consumers brought about by the activities of producers. They are not entities and for this reason cannot be stocked. A hospital can hold stocks of medical goods and equipment ready for use but it cannot hold stocks of appendectomies ready to meet an epidemic of appendicitises. The notion of a stock of appendectomies that exists independently of both surgeons and patients is pure nonsense. The notion of a transport firm holding a stock of ton or passenger miles is equally absurd. This is not a physical impossibility attributable to the fact that ton miles are highly perishable (as it would have to be if a ton mile were a good) but a logical impossibility stemming from the concept of a service. The impossibility of putting services into stock is not a generalization that needs to be verified empirically.

Because it is not an entity, it is not possible to establish ownership rights over a service and hence to transfer ownership from one economic unit to another. In contrast to goods, therefore, services cannot be traded independently of their production and consumption. It is not possible, for example, to produce services in one country and subsequently export them to another country in the way that automobiles or computers can be produced in one part of the world and transported to other parts. Services can be, and are, exported, but only by resident producers providing the services *directly* to non-resident consumers. This imposes a major constraint on international trade in services.

Compare, for example, the manufacture of vehicles with their servicing and repair. The latter may use many of the same materials and processes as were used in their original manufacture. The difference between manufacture and repair lies in the fact that the output of the manufacturer consists of a separate entity, a vehicle, whereas the output of garage does not. The manufacturer's output can be stored in inventory or transported anywhere in the world. It can be sold to intermediaries who can handle the distribution of the output throughout the world. The entire world production could be concentrated in a single location. On the other hand, the servicing and repair of the vehicles must be very widely diffused to reflect the pattern of vehicle ownership. Garages work on goods which are owned by their customers. The output of garages consists of repairs, not repaired vehicles.

The value added of the garages is measured by the value of the output, i.e., the repairs, less the intermediate inputs consumed in the form of oils, tires, spare parts, fuel, etc. The vehicle to be repaired is not itself an intermediate input into the production process of the garage and cannot form part of its output.

Because the vehicles are owned by their customers there are two important constraints on the production of repairs which do not apply to the original manufacture of the vehicles. The first is that the time at which the production takes place is largely determined by the customers. Garages cannot stockpile repairs in slack periods in order to anticipate peak demands which may occur when the weather is bad. The second constraint is that garages must be located fairly close to the customers (even though vehicles are mobile). Their location has to reflect the pattern of vehicle ownership.

These constraints on the timing and location of production apply not only to garages but to service *establishments* in general. They do not, of course, prevent many service establishments being owned by the same enterprise. Some economies of scale may be achieved with respect to ancillary activities such as purchasing, administration, advertising, and so on even for a group of quite small service establishments. Some service *enterprises*, such as transport or accounting firms, may become very large, even multinational. Even so, they cannot concentrate all their production in a single location of their own choice, or fix their production schedules independently of their customers.

These constraints on the production of services clearly do not apply to the production of intangible goods. Much of the world's film and software industries is concentrated on the west coast of the United States in the same way as the world's aircraft production.

One final example may be used to highlight the key economic differences between the production of goods and services, namely a manufacturer who contracts out one stage of the manufacturing process, such as the assembly of some parts, to an independent producer. The production process as a whole is not changed technically even though a new service activity is created. The subcontractor provides a service to the manufacturer by assembling parts that do not belong to him, a service that is not very different from that provided by an employee. The parts are not intermediate inputs into the subcontractor's production just as the assembled units are not his output. The subcontractor is subject to the same constraints as apply to all service producers, the timing of his output being largely determined by the rate at which the manufacturer, his customer, supplies parts to be assembled. The subcontractor cannot assemble parts in advance of receiving them from the manufacturer.

The subcontractor is in a different economic position from an independent producer who makes components for sale. The component producer does own his output prior to selling it to the manufacturer. He can build up stocks of components and control the flow of his own output. He bears the capital cost of holding any inventories. He also runs the risk of having unsold outputs left in inventory, a situation which is impossible for the subcontractor, or indeed service producers in general.

These examples are intended to illustrate the fundamental point that the distinction between goods and services, and the industries which produce them, is a distinction in which terms such as 'tangible' and 'intangible', or 'material' and 'immaterial' are irrelevant, unnecessary and misleading. The output of many service producers consists of *material changes* in the goods (or persons) on which they work, but they remain services when carried out for the benefit of other economic units. From an economic point of view, it makes a considerable difference who owns the goods involved, who controls the timing and location of production, who bears the capital costs and who assumes the risks. The distinction between the production of goods and services often depends more on these economic factors than on the nature of the production process.

4. Conclusions

The constraints on the timing and location of service production imposed by the relationships which must exist between individual producers and consumers bring into question the relevance to services of those parts of economic theory that implicitly or explicitly assume that production and trading are two separate economic activities. The constraints make it impossible to set up complex distribution channels which are separate from production. They have to be among the factors contributing to the slower growth of productivity in services. The constraints reduce the scope for economies of scale by limiting the size of most service establishments and imposing restrictions on their location. The small size of most service producers is no accident. The constraints do not apply to producers of intangible goods.

The intrinsic differences between intangibles and services are evident in international trade where the liberalisation of trade in 'services' has become a major policy concern for some countries. Although intangible goods are included along with genuine services the policy issues involved are totally different. Trade in intangibles is concerned with the enforcement of property rights over intangible entities and the exchange of such property rights. Because of the constraints which affect the timing and location of genuine service production, however, the liberalization of trade in services is more concerned with the right of service enterprises to set up establishments in foreign countries, or the rights of professionals to practise in other countries.

The traditional assimilation of intangibles with services has unfortunate consequences for the statistical systems, standards and classifications underlying the data used for economic analysis. Although the 1993 SNA, which is being implemented by almost every country in the world, recognizes artistic originals and computer software as being intangible assets, and therefore implicitly as intangible goods, it does not recognize scientific originals produced by research and development as intangible assets (see Hill 1997). This inconsistency stems from the decision, after much debate in the process of the revision of the SNA, to continue to treat expenditures on R and D as current and not capital. It is becoming increasingly indefensible, however, from an economic point of view to deny scientific originals the status of intangible assets given the important contribution they appear to make to economic growth. The present SNA treatment means that not only gross fixed capital formation is understated but even GDP as a result of classifying all the R and D undertaken by enterprises as intermediate consumption.

Intangibles are also misclassified as services in the standard international classifications of industries and products, ISIC and CPC, which have also recently been revised. Misclassifying intangible goods as services means that they are frequently quoted to 'prove' that no valid distinctions can be drawn between goods and services. For example, the proposition that stocks of services cannot exist independently of their producers and consumers intangibles can apparently be ‘disproved’ by showing that stocks of intangibles exist. Such demonstrations merely add to the confusion about the real characteristics of intangibles and services. Services are inherently heterogeneous, but not so heterogenous as to embrace intangible goods.

Intangibles should also not be interpreted as products that lie in some twilight zone between goods and services, blurring the distinction between them. They have all the essential economic characteristics of goods. The traditional dichotomy between goods and services can be preserved provided intangibles are grouped with tangible goods. On the other hand, intangibles are sufficiently different from tangible goods that there may be a case for identifying them separately by having a trichotomy of tangible goods, intangible goods and services. A major step in this direction has been taken in the new North American Industry Classification System which identifies a new Information and Cultural Industries Sector whose products it explicitly acknowledges to be unlike both traditional tangible goods and traditional services.[5] The international classifications, including those used in the European Union, need to be revised in a similar way. Good science rests on sound classifications. The existing confusion between intangibles and services in economics cannot facilitate economic analysis in general nor the analysis of the role of information in the economy in particular.

Notes

The author would like to thank referees for helpful suggestions. The paper was written before the author took a position with the UN Economic Commission for Europe and the views expressed are his own.

1 For a summary of the broader issues, see the section on “Services in economic thought from 1700 to the present day” which makes up the first part of Delauney and Gadrey (1987).

2 In SNA terms, the leather, thread, wax and other materials owned by the shoemaker are intermediate inputs used to produce shoes as outputs. On the other hand, the dirty shoes do not belong to the shoeblack. They are not intermediate inputs into his production just as the clean shoes are also not his output. The output consists only of the cleaning and is not a separate entity from the customer’s shoes.

3 The term ‘consumption’ is ambiguous as it can mean *either* the acquisition, typically the purchase, of a good or service for purposes of consumption *or* the use of that good or service to provide satisfaction or utility. Consumption in the second sense typically occurs later than in the first sense. For example, food may not be eaten until some time after it is purchased. Similarly, a consumer may continue to derive utility from a service such as medical treatment, which may bring about a permanent improvement in the condition of the consumer, long after the service is provided. Services need not be consumed in the sense of being completely used up and no longer able to provide utility at the moment they are produced. A more precise statement about the timing of the production and consumption of services is that they must be *delivered* or *provided*

to the consumer at the time they are produced (whereas goods may remain in inventories and not be delivered until long after they are produced).

4 Although financial assets may be entities over which ownership rights exist they are not goods as normally understood. A financial claim of a creditor over a debtor is not an entity that exists independently of the creditor.

5 The notes to the classification state that "the value of these products does not lie in their tangible qualities but in their information, educational, cultural or entertainment content."

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