Review of Income and Wealth
Series 49, Number 3, September 2003

TREATMENT OF MOBILE PHONE LICENSES IN THE NATIONAL ACCOUNTS

BY ROBERT J. DIPPELSMAN*

Statistics Department, International Monetary Fund

AND

NILS Ø. MÆHLE*

African Department, International Monetary Fund

This paper addresses the question of how to record mobile phone license payments in the national accounts. It concludes that there are usually two assets involved with mobile phone licenses: the spectrum, which is owned by the government, and the license, which is an intangible nonproduced asset sold by the government to the licenseholder. The values of these two assets are linked complementarily. A set of indicators is proposed that jointly may help judging whether the license or lease arrangement constitutes an asset in its own right or not. Alternative treatments of recording the license payments such as sale of the spectrum itself, other taxes on production, production of a service, or rent, are considered and rejected. Methods of amortization of the license over its life are considered.

I. INTRODUCTION AND OVERVIEW

This paper addresses the question of how to record mobile phone license payments—and, by extension, payments for other licenses that provide exclusive rights of significant economic value, as well as payments for long-term leases on land and buildings—in the national accounts. The treatment of mobile phone license payments in the national accounts has been hotly debated in recent years, following the auctioning in several countries of mobile phone licenses for substantial values.[1]

Note: The authors are grateful to Adriaan Bloem, Carol Carson, Paul Cotterell, Cornelis Gorter, Anne Harrison, Barbro Hexeberg, John Joisce, Martin Kellaway, Paul McCarthy, Brian Newson, Neil Patterson, John Pitzer, Jan van Tongeren, and two anonymous referees for their comments. Any remaining omissions and errors are solely the authors' responsibility. Draft versions of this paper were presented at the September 2000 OECD Meeting of National Accounts Experts and at the April 2001 Special Expert Group Meeting called by the Inter-Secretariat Working Group on National Accounts (ISWGNA) to discuss the treatment of mobile phone licenses in the national accounts. A longer version of this paper appeared as an IMF Working Paper in June 2001 and is available from the IMF website (www.imf.org). The overall approach and core conclusions of this paper are consistent with the position adopted by the ISWGNA as reflected in ISWGNA (2001, 2002) and Lequiller (2002), and by the UN Statistical Commission (Hannig, 2002).

The views expressed in this paper are those of the authors and do not necessarily represent those of the IMF or IMF policy.

*Correspondence to: Robert J. Dippelsman or Nils Ø. Maehle, International Monetary Fund, 700 19th Street, NW, Washington, DC 20431, USA (RDippelsman@imf.org; NMaehle@imf.org).

[1]For example, in the United Kingdom the payments for licenses were roughly 2 percent of GDP in the year in which they were auctioned.

Mobile phone licenses are typically issued by governments to give the holder, or a selected group of holders, the exclusive right to provide mobile phone services or otherwise use specified parts of the electromagnetic spectrum[2] for a limited period of time. The licenses may be allocated either by an auction or by a discretionary issue to those considered the worthiest applicants. (Discretionary allocation is often described as selection by "beauty contest.") If the licenses are allocated through an auction, the holders usually pay a significant initial amount for the license, sometimes with installments in addition. In contrast, if licenses are allocated through a beauty contest, the holders may be awarded the license free of charge or with a capital and/or recurrent fee. Licenses may, or may not, be cancellable by the government before the end of the period. Licenses may in some cases be explicitly or indirectly transferable to a third party without the permission of the license issuer. Most licenses are for a fixed period, although some may be permanent.

The text of the *System of National Accounts 1993* (*1993 SNA*) does not give specific guidance on the treatment of mobile phone licenses. Consequently, the treatment needs to be decided on general principles and by analogy with related cases, in particular, for the treatment of leases of land. Two options of treating the payments for the mobile phone licenses have dominated the debate: (1) that most mobile phone licenses are assets in their own right, which are classified as intangible nonproduced assets according the *1993 SNA*, and that any related up-front payment or payments by installments whose full present value are agreed upon at the time of signing the license arrangement should be recorded as for a sale of the license asset (Dippelsman and Mæhle, 2001; ISWGNA, 2001); or (2) that all payments related to the license should be recorded as (prepayment of) rent and that only a subsequent sale of the license to a third party can be recorded as a sale of an intangible nonproduced asset according to the *1993 SNA* (Kellaway, 2000; Lynch, 2001, 2002). It has also been argued that the licenses should be recorded as a sale of a tangible nonproduced asset (Magniez, 2001) or that classifying the partial or split ownership arising from lease/license interests as a category under the heading for each type of leasable or licensable asset be considered as part of a revision of the *1993 SNA* (Dippelsman and Mæhle, 2001; Harrison, 2001; and Section II.E of this paper).

In this paper, we find (Section II.A) that the electromagnetic spectrum meets the *1993 SNA* criteria for recognition as an economic asset, and should be classified as a tangible nonproduced asset. Thus, spectrum licenses are similar in essence to land leases in that they give a right to use a tangible nonproduced asset, and, accordingly, payments for use of the spectrum should be treated similarly to payments for the use of other tangible nonproduced assets such as land.

The *1993 SNA* does not, however, provide sufficient guidance for determining the appropriate accounting treatment of different types of leases of tangible nonproduced asset, which can be of very different economic natures. In particular, the *1993 SNA* provides limited discussion of the difference in economic nature between up-front payments e.g. 99-year land leases and periodic payments for

[2]Spectrum licenses give the holder a right to use specified frequencies for telephone signals in a specified area and, hence, provide the basis for operating a mobile phone network.

shorter-term leases, or, put differently, of the borderline between putting the land at the disposal of another unit and transferring ownership over the right to use land. The *1993 SNA* does not stipulate that all land leases be treated as rent: some land leases are current in nature while others are capital and some may be both. Similarly, the issuance of mobile phone licenses can be current or capital transactions. From the examples given in the *1993 SNA*, it is clear that transferable leases and licenses are assets while short-term leases are usually current transactions, giving rise to a treatment as rent payments. There are no clear criteria in the *1993 SNA* and different interpretations have arisen. Consequently, we propose (Section II.B) a set of indicators, based on general principles, that would be more explicit than the *1993 SNA* to help in judging whether a license or lease arrangement constitutes sale of an asset, rent, or a combination of both. We conclude that all payments related to licenses and leases that constitute assets and whose full value is determined at the time of commencing the arrangement are for the sale of the asset.

We find (Section II.B, C, and D) that the *1993 SNA* recognizes three alternative accounting treatments of payments for the use of a nonproduced tangible asset, such as the spectrum or land by another entity for a limited period—as the creation and sale of a license asset, as payment of rent, or as a combined creation and sale[3] of a license asset and payment of rent—depending on how the risks and benefits of *ownership over the right to use* the asset during the period are allocated.

We also consider and reject (Section III) the proposed options for treating the license payments as being for the purchase of full ownership over the spectrum itself (unless the license is for an infinite period), as taxes, or as payment for services. Finally, we suggest (Section IV) an alternative for recording the decline in the value of the license asset to the licenseholder over the remainder of the asset's life) and the consequential rise in the value of the spectrum to the government. The *1993 SNA* treatment is to record such changes in the value of a nonproduced asset in the "other changes in volume of assets" account.

The paper's conclusions are based on the general principles outlined in the *1993 SNA* and general economic concepts, and are consistent with the *International Accounting Standards 2000* (*IAS 2000a*) treatment of such licenses as intangible assets.[4]

II. Treatment of Mobile Phone Licenses under the *1993 SNA*

The *1993 SNA* defines economic assets as

entities:
(a) over which ownership rights are enforced by institutional units, individually or collectively; and

[3]The price may be zero.

[4]The paper's conclusions and economic reasoning are also consistent with changes to the IAS for operating leases to record as asset and liabilities the rights and obligations conveyed by a lease currently being considering by the IAS Committee (IAS, 2000b). The IAS Committee's proposal, however, goes further than the *1993 SNA* text allows by recording as asset and liabilities the rights and obligations conveyed by lease arrangments currently classified as operating leases.

(b) from which economic benefits may be derived by their owners by holding them, or using them, over a period of time (*1993 SNA*, paragraph 10.2).[5]

A. *Electromagnetic Spectrum as a Tangible Nonproduced Asset*

In the light of the *1993 SNA* definition of economic assets, the electromagnetic spectrum meets the criteria for recognition as an economic asset at the time its commercial potential is established.[6] A government can derive economic benefits from the spectrum—for instance, by selling the right to use the spectrum. The spectrum has no economic value until its commercial potential has been established. Once the government sells the right to use the spectrum, however, the value of the economic benefits that can be derived from use of the spectrum is established, and consequently the economic value of the spectrum can be measured.

The spectrum should be classified as a tangible nonproduced asset. The *1993 SNA* defines tangible nonproduced assets as those "that occur in nature and over which ownership rights have been established. Environmental assets over which ownership rights have not, or cannot, be established, such as the high seas or air, are excluded because they do not qualify as economic assets" (*1993 SNA* 13.53). The physical and measurable aspects of the spectrum indicate that it should be regarded as tangible and not intangible. Moreover, the spectrum cannot be regarded as an intangible nonproduced asset since it is not a "construct of society" (see definition of intangible nonproduced assets below). The government's ability to sell rights to use the spectrum shows that ownership rights have been established.

The spectrum has a potentially infinite life. Its economic value at any time is, however, dependent on its potential future use. In an extreme, it could be argued that the spectrum will only ever be useful for a particular technology that is expected to become obsolete, in which case the spectrum would have no residual value after the license was issued. It is very likely, however, that other uses for the spectrum are possible, and technological development has historically generated more and more demand for electromagnetic spectrum. Accordingly, although the estimation of the net worth of the spectrum is uncertain, assuming that the value of its use after the current generation of licenses is zero is not realistic.

B. *Mobile Phone Licenses as Intangible Nonproduced Assets*

Mobile phone licenses can meet the criteria for being economic assets in their own right given in the *1993 SNA*, paragraph 10.2 (quoted in Section II.A above). The *1993 SNA* definition of economic assets in essence describes assets as a bundle of economic benefits expected to be received over time. The current market value of the asset is the present value of the sum of those benefits. Following the *1993 SNA* definition of economic assets, the permission to use an asset owned by one party is an asset for the other party only if some of the benefits and risks of own-

[5]This definition parallels the *IAS 2000* definition of assets as "a resource controlled by an enterprise as a result of past events and from which future economic benefits are expected to flow to the enterprise" (*IAS 2000* 38.7 and F.49(a)).

[6]In the *1993 SNA*, recognition of the initial appearance of the asset is effected through the "other changes in volume of assets" account (*1993 SNA* 12.19).

ership are transferred to the other party. Some of the benefits of ownership that can occur in the case of mobile phone licenses are the right to transfer to another and the right to use the spectrum for a specified period with some security of tenure and exclusivity. If the license has such attributes, then it is an economic asset and any payments in exchange for it must be deemed as being for the sale of an asset.

More specifically, mobile phone licenses would fall within the *1993 SNA* definition of intangible nonproduced assets, which is defined in the annex to Chapter 13 of the *1993 SNA* as "constructs of society." These assets are "evidenced by legal or accounting actions, such as the granting of a patent or the *conveyance of* some *economic benefit* to a third party. Some *entitle* their owners to *engage in certain specific activities and to exclude other* institutional units from doing so except with the permission of the owner. Intangible nonproduced assets include patented entities, leases, other transferable contracts, purchased goodwill. . . ." (See also 13.62 and 13.63. Emphasis added in this and subsequent *1993 SNA* quotations.)

The annex to Chapter 13, furthermore, states that intangible nonproduced assets include leases or contracts where the lessee has the right to convey the lease to a third party independently of the lessor. Examples include leases of land and buildings and other structures, concessions or exclusive rights to exploit mineral deposits or fishing grounds, transferable contracts with athletes and authors, and options to buy tangible assets not yet produced.[7]

Lease and license assets are created at the time of making the contract, not at the time of sale of the lease or license to a third party. The *1993 SNA* clarifies in paragraph 12.21 that ". . . intangible nonproduced assets . . . make their appearance in the System when . . . transferable contracts are written . . . The writing of transferable contracts consists of the coming into force of a binding agreement that provides some economic benefit that can be passed on to a third party independently of the provider of that benefit."

The opponents of treating issuance of mobile phone licenses as a sale of an intangible nonproduced asset have argued that only a subsequent sale of the license to a third party can be recorded as a sale of an asset (Kellaway, 2000; Lynch, 2001, 2002; Magniez, 2001; Pitzer, 2002). This argument, however, confuses the point of creation of an asset with the point at which reliable nonzero valuation may be possible. It would appear artificial and unrealistic for the resale of a license or lease to be regarded as an event that creates an asset. The lease or license must have been an asset prior to being sold, and the only event through which it can have come into existence is the signing of the contract, because that was when some of the benefits and risks of ownership were transferred from the original owner.

In cases where the lease or license is an asset, the tangible asset (the spectrum) and derived intangible asset (the lease or license) are linked. Their values are complementary, so the value of the spectrum to the government increases as the license runs down. The existence of these two related assets reflects the fact that the benefits and risks associated with the use of the spectrum are split between the

[7]Again the *1993 SNA* text parallels the *IAS 2000*, which lists ". . . licenses, intellectual property, market knowledge and trade marks, . . . patents, copyrights, motion picture films, customer lists, mortgage servicing rights, fishing licenses, import quotas, franchises, . . ." (*IAS 2000* 38.8) as examples of entities that may be intangible assets if the they meet the general criteria for being assets, that is, "identifiability, control over a resource and existence of future economic benefits" (*IAS 2000* 38.9).

licenseholder and the government. In essence, the underlying asset—the spectrum, in this case—is partitioned, and parts of its economic dimensions—the right to use it for a certain time—is sold. The nature of assets that arise under lease and license arrangements—the lease/license asset and the residual interest in the underlying property—differ from those that are obtained by legal ownership over the underlying property without any strings attached, in that the risks, control, and rights involved are split between the parties.

We propose the following indications that some of the benefits and risks of ownership have been transferred as ways of identifying when a new economic asset has been created:

- *Limited cancellability.* The benefits and risks from the right to use the underlying asset are transferred to the licenseholder if the license cannot be canceled except due to a breach of the license conditions.
- *Degree of exclusivity.* The economic benefits of ownership may be derived only if there is a significant amount of exclusivity.
- *Actual or de facto transferability.* The potential to resell the license is unequivocally a kind of ownership right and shows that the license is an asset. In practice, most licenses are transferable either actually (by the licenseholder selling the license to another business) or effectively (through the licenseholder being acquired through a takeover).
- *Demonstrable value.* Even in the absence of transferability, the license may provide benefits to the owner and contribute to the net worth of the licenseholding company, and thus have a value that may differ from the amount of agreed value of the license payments. Having a demonstrable value that may differ from the amount of agreed license payments would be a compelling indication that the license is an asset.
- *Holding gains and losses accrue to the licenseholder.* Holding gains and losses accrue to the owner of assets. Accordingly, if any holding gains or losses on the underlying asset accrue to the licenseholder, then the license has a value that may differ from the amount of agreed license payments, and, thus, the license must be an asset.
- *Agreed value of payments over a long period.* Agreeing on all the amounts to be paid, by lump sum and/or by installments,[8] removes for both parties the uncertainty of adjustable year-by-year payments associated with rent and effectively transfers some of the risks associated with ownership to the licenseholder.
- *Length of the license*. The *1993 SNA* (and the *IAS 2000*) definition of assets requires that economic "benefits may be derived . . . *over a period of time*"—the length of time is conventionally set as more than one year.
- *Control.* A certain degree of control over the use of the underlying asset is required for the contract to represent a transfer of economic ownership over the right to use the underlying asset.

[8]Agreed values include payments by installments indexed to a general measure of inflation, but not payments adjustable to future market conditions. This is because at the time of issuance, the present value can be established for payments by installments that are indexed but not so for payments that are adjustable to future market conditions.

- *Licenseholder behaving as having obtained ownership over an asset*, as demonstrated by how the license is treated in the balance sheets, share values, and decisionmaking.

Ultimately, the accounts should reflect economic behavior and its causes for the accounts to be analytical useful—recording must be consistent with the perception of the parties.

The following example illustrates how long-term transferable leases can have a market price that is independent of the original purchase price—a situation that is consistent only with the lease being an asset in its own right. A transferable, noncancellable lease could be signed for the use of a parcel of land for ten years in exchange for a payment of $100 per year with no up-front payment. If the demand for this type of land later increased, another party would be willing to pay the leaseholder a premium for taking over the lease because, by the terms of the lease, the payment remains $100 per year. In this case, the lease would have a value that is independent of the agreed $100 annual payment. In addition, the potential sale value of the land to the landowner would increase but not by as much as similar (unleased) land because, in effect, part of the increased market value of similar land would be captured by the leaseholder rather than the landowner.

Licenses can be assets even in the absence of transferability. The *1993 SNA* definition of an economic asset requires only that economic benefits of ownership can be derived by holding the asset. While the ability to sell the license is unequivocally an economic benefit of ownership, other benefits can be derived from a right to use the spectrum even in the absence of transferability. Otherwise, the term "economic benefits" would need to be construed restrictively as not meaning anything more than the ability to transfer. Long-term nontransferable licenses provide benefits to the owner and contribute to the net worth of the licenseholder. For example, commercial fishing licenses may generate large benefits even in cases where they cannot be transferred, and some television broadcasting licenses are also not transferable. A holder of a nontransferable lease or license can, furthermore, effectively capture parts of any holding gains or losses on the underlying asset, as evidenced by the fact that the potential sale value of the underlying asset would change by less than a similar unleased asset. Of course, lack of transferability makes a license less valuable and provides fewer opportunities to measure values in practice. For that reason, most transferable licenses are readily measured only at the time of transfer, and nontransferable licenses sold by auction can be measured at the time of issue.[9]

For short-term nontransferable licenses, the borderline for being an economic asset may be difficult to draw in practice. Accordingly, a convention based on the length of the license may need to be adopted in order to have a practical way of distinguishing sales of assets from rent. Based on usual national and business accounting conventions, the borderline may be considered to be one year, although this is arguable.[10] Because of the scale of investment required, in

[9]The June 2000 Inter-Secretariat Working Group on National Accounts meeting confirmed that, when the *1993 SNA* was drafted, transferability was not seen as a condition for leases and other contracts to be assets but as a practical condition to be able to measure their value.

[10]Eurostat (2000) has proposed a five-year criterion in this case.

practice, mobile phone licenses that are issued by governments are generally for long periods.

Following accrual principles, the timing of payment(s) for a license is a financing issue and does not determine whether the license is an asset. In practice, however, business arrangements for payment usually coincide with the passing of risk, so that, for example, cancellable or short-term arrangements typically involve payments at specified intervals rather than a single up-front amount.

Broadly, there are three ways of paying for the license—a single up-front payment, payments at specified intervals, or a combination of the two. If the value of the payment is determined in advance (fixed or indexed), it is part of the asset sale price. Thus, the asset sale value is equal to any up-front payment plus the present value of all future payments whose value is determined when the license is issued, according to normal accrual principles. In that case, the periodic payments represent interest and repayment of principal of an "other accounts payable" liability for the licenseholder to the issuer.[11]

The accrual-based time of recording of the purchase of an asset is when the license is issued. In cases where the license takes effect some time after issue, it can contribute value to the licenseholder before it takes effect and, in some cases, could be sold to a third party in advance.

C. *Rent*

Rent is defined as "the income receivable by the owner of . . . a tangible nonproduced asset in return for . . . putting the tangible nonproduced asset at the disposal of another institutional unit" (*1993 SNA* 7.88) and tangible nonproduced assets cover "mainly land and subsoil assets" (*1993 SNA* 7.87).

The spectrum is also a nonproduced nonfinancial tangible asset and is, therefore, analogous to land. When a part of the spectrum is put at the disposal of the licenseholder, but in a way that does not transfer the risks and benefits of ownership, it gives rise to "spectrum rent."

In practice, however, mobile phone license payments are not usually rent because they typically confer tenure and exclusivity during the license period, so as to provide security to make possible the large investment required to establish and market a network. The licenses provide (semi-) exclusive access to the spectrum that, in effect, allows them to make larger profits than would be the case if there were open access to the spectrum, and thus contribute to the net worth of the licenseholder company. Typically, the risks associated with ownership are effectively transferred to the licenseholder by requiring that the total amount to be paid is provided up-front or otherwise agreed upon in advance. Consequently, the present value of the expected future larger profits obtained by having the license may differ from the amount of agreed license payments; this is a compelling indication that the license is an asset because this aspect of the risks of ownership has been transferred to the licenseholder.

[11]If the license is sold to a third party, this liability typically is also transferred, and only the difference between the full license value and the present value of the future agreed payments is paid by the purchaser.

Some possible license arrangements, however, would give rise to rent and would not be assets. For example, if the license gave rights to use the spectrum but was contractually cancellable at any time by the government at its sole discretion, the license would not constitute an entity for which ownership rights are enforced and, thus, would not be an asset. Similarly, a mobile phone licenseholder may lease out some of its excess bandwidth to other operators for shorter periods. License payments that relate only to subsequent revenue or profits would be rent if contractually agreed because the risks and benefits have not been conveyed.[12] Rent may be fixed or variable, as noted in *1993 SNA* 7.133 (although a payment that is fixed in advance over a long period suggests that the leaseholder may have acquired some risks and benefits of ownership). As well, in some cases discussed below, the arrangements involve both rent and an asset sale.

The borderline between putting an asset at the disposal of another unit (i.e. deriving rent), selling a right to use the asset for a limited period (i.e. creating an asset in itself), or a combination of both may be difficult to draw in some instances. As noted in the discussion of assets above, in the absence of transferability or other methods of valuation, a convention based on length of the license may be needed. In the *1993 SNA* 7.88, the possibility that rent might be earned on a lease that lasts up to several years is recognized. If interpreted in the light of the definition of an asset, such cases would be limited to those where the lease was not an independent asset—for example, because it was cancellable at the landlord's discretion.

Up-front payment for a license that does not transfer the risks and benefits of ownership to the licenseholder, and thus does not meet the criteria presented above for being an asset, represents prepayment of rent. Under accrual principles, the prepayment of rent should be allocated over the life of the license, following the usual discounting principles, and not just at the time of payment. Such a case requires imputations for interest flows, repayment of principal, and rent payments based on a discount rate. An example of such calculations is shown in Dippelsman and Mæhle (2001).

D. *Combined Asset/Rent Arrangements*

In some cases, the arrangements have elements of ownership for both parties during the period of the contract, such as profit-sharing arrangements often used for extraction activities. In such cases, there may be both a lease/license asset that transfers (partial) ownership over the right to use the underlying asset and property income payments to compensate the owner of the remaining part. The *1993 SNA* mentions an example in 10.129:

> The owner of subsoil assets . . . may grant a concession or lease to another institutional unit entitling the latter to extract the asset over a specified period of time in return for a series of payments (usually described as royalties[13]). . . . The payments are property incomes and recorded as rent. . . . However, the holder of the concession or lease may be entitled, or permitted by the

[12]They would be taxes, however, if imposed by legislation.

[13]"Royalties—(a) a share of the product or profit reserved by the grantor esp. of an oil or mining lease, (b) a payment made to an author or composer for each copy of work sold or to an inventor for each article sold under a patent" (*Merriam Webster's Collegiate Dictionary*, 10th edition).

owner, to sell the concession or lease to a third party. Such a sale is recorded . . . as the sale of an intangible non-produced asset. . . . Sales of leases on land or buildings are treated similarly."

Proponents of the rent-only option appear to interpret *1993 SNA* 10.129 as stating: (1) a general position that only the subsequent sale of the license to a third party should be recorded as a sale of an intangible nonproduced asset; (2) that the signing of the initial license contract cannot be an event that creates a new asset; and (3) consequently, that all payments between the license issuer and licenseholder must be recorded as rent (Kellaway, 2000; Lynch, 2001). We find this interpretation of 10.129 inconsistent with economic reality and general national accounting principles, including the general definition of economic assets given in 10.2. Further, that interpretation directly contradicts *1993 SNA* 12.21, which states that lease and license assets are created at the time of making the contract, rather than the time of sale of the lease or license to a third party (see Section II.B above and *1993 SNA* 12.21).

In contrast, we interpret *1993 SNA* 10.129 as simply recognizing that there are cases where the lease is an asset and rent is payable. Because it is logically impossible to "rent" an asset that one already owns the full right to use, the coexistence of rent and a lease/license asset is limited to cases where the contract terms either (1) do not confer full ownership over the rights to use, for the specified time, all of the underlying asset put at the lease/licenseholder's disposal; or (2) establish a profit-sharing arrangement where the ownership over the rights to use is exchanged, partly or fully, for another asset from which property income may be earned.

License payments based on subsequent performance, such as sales or profits, mean that the spectrum owner maintains some of the risks and benefits of ownership during the license period. In these cases, a gross and a net treatment can be envisaged:

(1) Under the gross treatment, the spectrum owner is shown as transferring the ownership over the right to use the spectrum for the specified time in exchange for (in addition to any up-front payments) a share of the future sales or profits. As a result, the claim on future sales or profits represents a financial liability of the licenseholder, and the claim's present value represents a part of the purchase price of the license asset (although the amount is uncertain).

(2) Under the net treatment, the spectrum owner is shown as transferring only a partial ownership over the right to use the spectrum and retaining some ownership from which property income may be earned, so that the performance-based payments represent property income[14] and would not be part of the purchase price of the license asset. Any up-front payment and the present value of all future payments whose value is determined when the license is issued must, however, be deemed as being part of the purchase price of the license asset.

[14]Alternatively, if the payment requirements were imposed by legislation outside the license agreement, they would be taxes. In contrast, requirements agreed as part of the auction or negotiation process are consensual and so could not be taxes.

The references to having rent payments and an asset at the same time, particularly in paragraphs 10.129–130, indicate that the *1993 SNA* assumes the net treatment.[15]

Under the net treatment of combined rent/asset arrangements, the lease/license asset may have a value of zero at the time of creation.[16] Its value could, however, subsequently be positive (or, in some cases, negative) in response to later developments. Even though initially valued at zero, the intangible asset needs to be recognized as being created when the lease/licenseholder acquires some risks and benefits of ownership. Many financial derivatives typically also have a value of zero at the time of inception and only take on value as market conditions change. Still, they come into existence as economic assets at the time of inception (see the *Financial Derivatives* supplement of the fifth edition of the *Balance of Payments Manual*, paragraph FD 17 and the *Monetary and Financial Statistics Manual*, IMF 2000 paragraph 261).

E. *Issues in Assets Classification*

There are many legal arrangements that allow aspects of the rights of ownership to be split and shared among different parties. However, the *1993 SNA* assets classification does not highlight the relationships between the component assets. Rather, it treats the distinction between tangible and intangible assets as more fundamental than the relationship of both to the same underlying asset. For example, a lease interest in land is shown in a different part of the classification the full or residual ownership of the land (no distinction is made between those two types of ownership).

An alternative classification of assets could show outright ownership, residual ownership, and partial or split ownership arising from lease/license interests as three different categories under the heading for each type of leasable or licensable asset. Such a classification would:

- Recognize the economic similarities of the use of an asset for a fixed period and for an unlimited period.
- Recognize that the economic value for the society of the underlying asset is approximately[17] unchanged by leasing and licensing it out. Consequently, it would be possible to avoid fluctuations in the total values for the economy of asset classes based on the remaining term of any lease or license they were subject to.
- Avoid the need to introduce consumption of fixed capital for intangible nonproduced assets to account for produced assets held under leases. (This situation may particularly arise for long-term asset-type leases of buildings.)

[15]In contrast, the proposed changes to the IAS treatment of operating leases recommend the gross treatment.

[16]The asset value would be zero if the present value of the expected future benefits is equal to the present value of the required payments series and no up-front payment is made.

[17]Leasing and licensing may change the total economic risk involved. Consequently, the market value of the aggregate of the lease/license asset and the residual interest may differ from initial value of the underlying property (e.g. the market value may increase because investing in the property (and taking over the lease) may be less risky when there is a tenant).

- Avoid the need to make imputed entries for the simultaneous disappearance of the value of one asset and appearance of another asset at the time of issue of the lease or license.

Fixed-period leases and licenses should still be regarded as a separate category under headings for land, buildings, etc. This separate category would reflect the fact that the nature of assets that arise under lease and license arrangements (i.e., the lease/license asset and the residual interest in the underlying property) differ from those that are obtained by legal ownership over the underlying property without any strings attached, in particular because the latter do not disappear over time. While this alternative classification is not envisaged in the *1993 SNA*, it may be useful for some kinds of analysis.

The same effect on economy-wide measures of total value for each asset classes could alternatively be achieved by including in the lease/license asset the full value of the underlying property and recognizing as a separate asset/liability the obligation to return it to the legal owner at the end of the contract. This alternative "gross" treatment may be advantageous for some purposes, such as gross capital stock measurements. The lessee/licensee's rights relate to only part of the property's economic life, however. In the context of wealth measurement, the value of the assets should reflect the fact that the economic benefits relating to the legal owner's residual interest were not transferred to the lessee/licensee in the first place. The accounting treatment should not make transactions that are not alike appear to be alike.

III. Other Treatments Proposed for License Payments

A. *Payments for Purchase of Full Ownership over the Spectrum*

For licenses for infinite periods or for as long as the spectrum is of economic use, it would be correct to treat the license as ownership of the spectrum. In that case, the government would lose any ownership of the spectrum. Although spectrum licenses have sometimes been issued for an unlimited term, this has primarily been done for frequencies used mainly for radio and television. Mobile phone licenses, however, typically have been issued for 15–30 years, in line with the expected life of a mobile phone technology. The spectrum itself, however, has a potentially infinite economic life in conjunction with future technologies. To say that the value of government's interest at the end of license is zero, there would need to be a certainty that no future technology could make economic use of the spectrum.

One argument put forward for treating the licenses as full ownership of the spectrum relies on an extension of the principles applied to financial leases. Ownership is generally the same as holding the legal title to the asset, but in the case of financial leases the *1993 SNA* recognizes that economic ownership and legal title are held by different parties. With a financial lease,[18] a financier holds legal title to a produced asset, but the *1993 SNA* treats it as being effectively owned by

[18]See *1993 SNA* 6.118 for further definition and explanation.

the user. In effect, the arrangement is treated as if the user had purchased the asset and the lessor is providing a loan to finance the purchase, as this is the economic essence of the contract.[19] Financial leases typically are arranged by financing companies, bear all marks of being a financing arrangement, and cover all or virtually all of the lessor's costs, including interest. At the termination of the lease ". . . the legal ownership is usually transferred to the lessee" (*1993 SNA* 6.118) for an agreed price. The lessor typically does not retain any effective control over, or interest in, the leased good except if the lessee defaults on payments. (A financial lease differs from other loans in that the good itself acts as security.)

Mobile phone licenses cannot be treated as equivalent to a financial lease of spectrum for several reasons. Financial leasing is expressly limited to produced assets in the *1993 SNA* because a finite asset life is implied by the requirement that the lease covers the effective economic life of the asset. Further, the government's interest in the spectrum goes beyond having a loan security in that it maintains its full ownership subsequent to the expiry of the licenses and it does not provide a loan that needs to be secured. In contrast to a financial lease, the government initially receives money from the licensee, rather than lending any money to the licensee, so up-front payments are in the opposite direction. Fundamentally, the objectives of the transactions are completely different (e.g. the government is not financing the purchase of spectrum).

Although the expiry of the license may be remote in time and outside the expected economic life of the licensed use of the spectrum, the license typically does not transfer full ownership over the spectrum. The government's continued ownership includes the right to transfer or use the spectrum for any purposes not precluded by the terms of the original license without prior agreement of the licenseholders. The remaining value of the spectrum, after sale of the right to use it for the specified time and purposes, may at the time be small, but the government still retains the right to sell its remaining interest.[20] As the remaining period of a license declines, the value of the spectrum to the government increases, so that after the license expires, the spectrum has its full value and the government can reoffer use of the spectrum for another generation of licenses.[21] The economic service life of the spectrum itself is potentially infinite. It should be noted that even if the license is specific to a particular technology, the spectrum itself is not technology specific and could be used for later technologies. This situation shows that the government holds both the risks and benefits of future changes in the usefulness of the spectrum.

[19]This treatment of financial leases illustrates that, in the *1993 SNA*, a transfer of full ownership over an asset occurs when the economic risks and benefits from all possible economic uses of the asset are transferred for the effective life of the asset.

[20]Similarly, a long-term land lease does not imply a transfer of all aspects of ownership over the land, only the right to use it for a fixed period, since the landowner always can sell the land, subject to the obligations in the lease, to a third party without the lessee's agreement. Leased land may, as the lease is approaching maturity, have a potential significant sales value. Even land leased out for 999 years may be nearing expiry in some countries and have a potential sales value.

[21]*Ceteris paribus*. Of course, the value of the spectrum and licenses may rise and fall according to technological and economic developments; such changes would be taken into account in the usual way in the revaluation account.

B. *Taxes on Production*

Essential features of taxes are that they are "compulsory, unrequited payments" (*1993 SNA* 7.48). Some license payments can be taxes. "If the issue of such licenses involves little or no work on the part of the government, the licenses being *granted automatically* on payments of the amount due . . . ," then they are taxes (*1993 SNA* 7.55). However, in the mobile phone cases, the payments clearly are made in return for a benefit (an *exclusive right* from which economic benefits can be derived), so that the payments cannot be considered to be unrequited and, therefore, are not taxes. Allocation through an auction or other form of contest indicates that something is being offered in return and precludes the possibility of the payments being a tax.

Most of the participants in the debate seem to agree with this conclusion. Pitzer (2002, p. 11), however, disagrees and argues that "to some extent most taxes are voluntary" and "many taxes are requited to some extent."

In some cases, there may be an additional obligation to pay the government for undertaking the activity that arises from legislation, rather than by mutual agreement as part of the auction or other contractual process. Such payments would be unrequited and thus a tax.

C. *Production of Services*

Production is "an activity carried out . . . that uses inputs of labor, capital, and goods and services to produce outputs of goods or services" (*1993 SNA* 6.15). The *1993 SNA* also considers that production takes place when produced assets or intellectual property are put at the disposal of other institutional units. The electromagnetic spectrum, however, is neither a produced asset nor intellectual property.

In the Form of Spectrum Licensing Services

Certain license charges are regarded as being payments for services (*1993 SNA* 7.55 and 8.54): ". . . if the government uses the issue of the licenses to exercise some proper regulatory function . . . the payments should be treated as purchases of services . . . unless the payments are clearly out of all proportion to the costs of providing the services" (*1993 SNA* 7.55). While there may be some regulatory aspect for mobile phone licenses, the payments are clearly out of proportion to any regulatory services provided.

In the Form of Rental Services

On basic principles, production of rental services occurs when a produced asset is put at the disposal of another institutional unit. If the license fee is a payment for a service, then there should also be a corresponding produced asset. Therefore, this argument also requires the implausible position that there is a production process to create the spectrum.

The *1993 SNA* deviates from this basic principle, however, in treating payments for use of research and development, such as patents, as services. In the *1993 SNA*, it was decided not to capitalize research and development because of

measurement problems, and hence patents were classified as nonproduced assets.[22] The treatment is anomalous because use of other nonproduced assets does not give rise to services. From the text and historical evolution of the *1993 SNA*, it is known that this treatment resulted from a late decision in the *1993 SNA* drafting process not to capitalize research and development expenses[23] and should not be extended to other assets.

IV. Amortization of the Value of the License and Reappearance of the Value of the Spectrum

As discussed in Section II, the values of the license asset and the spectrum asset are complementarily linked. In this section, we will deal with the accounting entries associated with the decline in the value of the license and the increase in the value of the government's residual interest in the spectrum as the remaining period of the license declines.

Associated with the amortization[24] of the license by the business is the issue of consequential increases in the value of the spectrum to the government as the license heads toward expiry. Although the license has a fixed life, except in the extreme case where the spectrum has no possible use outside the current technology and the technology is obsolete, the spectrum has an infinite life and can potentially be relicensed for the same or other uses at the end of the current license. Accordingly, as the license declines in value, the value of the spectrum to the government increases correspondingly, and this increase in the value of the spectrum to the government would have to be recorded in the government accounts to properly record the net worth of the government and the total economy. In this paper, this increase in the value of the spectrum to the government is called the reappearance of the value of the spectrum. As a result of the complementarity between the values of the spectrum and the license, the income, saving, and net worth of the total economy should not be affected by the timing of the license or the method of amortization/reappearance—only the distribution between the government and the licenseholder changes. Without recording the reappearance of the value of the spectrum, the net worth of society would decline solely as a result of the administrative arrangements for licenses. Similarly, the value of land subject to a long-term lease gradually rises in the hands of the land owner as the prepaid lease runs.

In this section, we will discuss two treatments of the amortization of the value of the license and related reappearance of the value of the government's ownership of the spectrum. The two possibilities are that amortization/reappearance entries are shown in either the "other changes in volume of assets" account (the

[22]The *1993 SNA* 14.114 and the *Balance of Payments Manual* (5th edition), paragraph 165 state that payment for the authorized use of an intangible nonproduced nonfinancial asset is to be recorded as a service, although the examples given make clear that this was intended to be limited to intellectual property.

[23]See, for instance, Hill (1997). The *1993 SNA* still recognizes research and development for output if done on contract or on a significant scale within an enterprise (consumed as intermediate consumption by another part of the same enterprise (*1993 SNA* 6.164)).

[24]Amortization is the entry in business and national accounting that deals with the gradual extinguishing, or decline in value, of fixed-term licenses, goodwill, patents, and other intangible nonproduced assets with finite lives. It provides a way of recording the cost to the business.

1993 SNA treatment) or the current accounts (the alternative treatment). The effect of both possibilities on the *1993 SNA* sequence of accounts is shown in Annex 2 of Dippelsman and Mæhle (2001), where, under certain conditions, the alternative treatment results in identical numbers to the treatment as rent for all main balancing items except net lending/net borrowing.

A. *The* 1993 SNA *Treatment of Amortization/Reappearance of Assets*

The *1993 SNA* discusses the amortization of finite-life intangible assets in 12.34 under the heading of "economic *disappearance* of nonproduced assets." Amortization is analogous to consumption of fixed capital in that both concepts account for the decline in the value of assets arising from their finite lives. Consumption of fixed capital, as defined in the *1993 SNA* 6.179, however, is specifically limited to produced assets; therefore, licenses are not included.

The corresponding increase in the value of the underlying asset to the government is not mentioned specifically in the *1993 SNA*. As it is the converse of amortization, it should however be included under "economic *appearance* of nonproduced assets." More specifically, it is a "reappearance" of value that had previously been held by the licenseholder. The IAS Committee proposals on leases use the terms "unwinding" of the residual interest and "accretion" of the residual value (IAS, 2000b; see also McGregor, 1996); these terms convey the idea of a gradual, predictable process better than the *1993 SNA* terms, which otherwise refer to unforeseen events. (As noted previously, only in the special case in which the spectrum was expected to have no further use for any technology at any time in the future would there be no reappearance of value.)

Both the disappearance of the value of fixed-term licenses and the economic reappearance of the value of spectrum are shown in the "other changes in volume of assets" account of the *1993 SNA*. As a result, the current accounts and their balancing items, such as income and saving, are not affected (except in the unusual case where issuer and holder were in different countries). As both the disappearance and reappearance are shown in the same account, no asymmetries arise, and the effects cancel out in aggregate net worth for the economy. However, because the license is intangible and the underlying asset is tangible, the balance between intangible and tangible assets changes over the license period.

B. *An Alternative Treatment of Amortization/Reappearance of Assets*

An alternative to the *1993 SNA* treatment would be to include the effect of amortization/reappearance of assets in the current accounts rather than in the "other changes in volume of assets" account.[25] For the licenseholder, taking into account amortization in deriving current account items such as net income and saving appears to be consistent with general principles of income measurement because it is an expense related to the process of earning income. It would also be consistent with the business accounting practice of treating amortization as a current cost, rather than an extraordinary item. In addition, this treatment would

[25]The proposed changes to the IAS for operating leases parallel this alternative recording in the current accounts of amortization and reappearance.

be more consistent with the nature of the "other changes in volume of assets" account, which mainly covers one-off, unpredictable events, rather than gradual processes that are an expected part of current business operations.

If included in the current accounts, amortization/reappearance would need to be shown in the income accounts with offsetting entries in the capital accounts. The result would be for amortization and reappearance to affect measures of primary and disposable incomes, as well as saving in the accounts of the licenseholder and issuer, but not affect value added or net lending/net borrowing. Since the entries for the licenseholder and issuer would be equal and opposite, the income and saving balancing items for the total economy would be unaffected, provided both parties were resident in the same economy. Note that only the amortization of intangible assets and the counterpart reappearance would be moved to the current accounts, whereas other cases of economic appearance and disappearance should remain as "other changes in volume of assets."

The entries for amortization/reappearance in the income accounts could be included within the property income items. Although not literally property income paid or received, amortization/reappearance are flows that relate to property. As well, their inclusion as part of property income would avoid the need to add a new, and typically small, item to the accounts that would usually be of little analytical interest and would be perplexing to those unfamiliar with the rather complex details of the treatment of intangible assets.

In the capital account, the offsetting entries would appear together with the item "acquisition less disposals" for the relevant asset types, with amortization being recorded for intangible assets and reappearance being recorded for tangible assets. This offsetting entry in the capital account would be like the entry for consumption of fixed capital and is a consequence of double-entry accounting. As a result, net lending /net borrowing would be the same under both the *1993 SNA* and the presented alternative treatment of amortization/reappearance (see Annex II of Dippelsman and Mæhle (2001) for a numerical example of this alternative treatment).

The alternative treatment of amortization/reappearance in the accounts would differ in some ways from the treatment of consumption of fixed capital in that amortization of licenses would require an offsetting entry in the accounts of the license issuer. Amortization/reappearance should not be entered in the production account, because the reappearance is not a negative cost and amortization of licenses does not relate to the using up of produced assets.[26] However, the method of calculation of amortization is the same as for consumption of fixed capital.

A result of the alternative treatment would be that the national accounts sectoral income and saving items would be similar for both rent and asset situations. They would be the same under the specific conditions that the asset life is infinite, that the benefit flows from the asset are equal each year (or at least, no information

[26]Amortization of intellectual property such as patents and copyrights appears to be different from licenses in that they arise from a production process, the underlying knowledge ceases to be an economic asset at the end of their lives, and they arguably could be treated exactly like consumption of fixed capital by being included as a use in the net version of the production account.

about changes in annual asset flows is known), and that the calculations use consistent methods (e.g. discount rates). The equivalence of the rent and the alternative treatments is not a coincidence: it arises because rights to use assets for a fixed period have a similar underlying effect, whether the arrangements happen to be of a current or a capital nature.[27] If the alternative treatment were adopted, net lending/net borrowing would be the only balancing item affected by the rent/asset distinction. Net lending/net borrowing is, by design, sensitive to whether net acquisition of assets is in the form of nonfinancial assets (such as the license) or financial assets (such as prepayment of spectrum rent). However, the rent result and proposed treatment of amortization/reappearance could differ in important ways. For instance, if technological development increased the use of that part of the spectrum, in the rent case, the current transactions would continue unaffected. In the asset case, there would be a revaluation of the asset, and the amortization and reappearance would increase. For this reason, the amortization/reappearance approach gives a better indication of sustainable income than the rent approach.

The alternative treatment seems to have several advantages over the *1993 SNA* treatment. The alternative treatment would respond to the concern that the *1993 SNA* treatment has the counterintuitive result of not affecting the income and saving measures of the licenseholders and government over the life of the license. The inclusion of these items in the current accounts would result in more appropriate measures of income and saving for both the issuer and holders of the licenses. In particular, it would show the licenses as raising the government's income over the license period. It would also avoid the possibility that income and saving measures could be dramatically affected by small underlying changes in the details of the license arrangements that could shift the classification between an asset or rent arrangement.

V. Summary and Conclusions

Although there is no specific discussion of spectrum licenses in the *1993 SNA*, the national accounting treatment for mobile phone licenses presented in this paper can be derived by applying the *1993 SNA* treatment for rights to use land and the *1993 SNA* definition of economic assets. This treatment is based on recognizing that the electromagnetic spectrum, like land, is a tangible nonproduced nonfinancial asset.

We have found that the *1993 SNA* recognizes the three following alternative accounting treatments of payments for the use of a nonproduced tangible asset such as the spectrum or land by another entity for a limited period, according to how the risks and benefits of *ownership over the right to use* the asset during the period are allocated:

(1) The sale of an intangible nonproduced assets if the risks and benefits of ownership are fully transferred to the license- or leaseholder during the period, and if the full (present) value of the payments are determined at the time of commencing the arrangement.

[27]A similar result for produced inputs occurs in the accounts in that net measures give the same result whether the input is arranged as a capital or current input.

(2) Rent, if the lease/license allows only for short-term use of the spectrum with little or no tenure or is contractually cancellable at any time by the government, and thus does not transfer to the license- or leaseholder the risks and benefits of ownership.
(3) A combination of rent and asset if the license issuer and licenseholder share the risks and benefits of ownership, as evidenced by the license or lease requiring continued payments to the issuer based on subsequent revenue or profits, rather than being fixed in advance.

In addition, we found that the license may represent ownership of the spectrum itself if the license is permanent.

Although each of these alternatives could arise with mobile phone licenses, most licenses are capital in nature because they are issued for fixed, long periods, with a high degree of exclusivity, and give some security of tenure to the licenseholder. Holding gains and losses typically also accrue to the licenseholder.

The value of the license should be amortized over its life. Under the *1993 SNA*, the amortization is shown in the "other changes in volume of assets" account and does not affect income or saving. The paper lays out an alternative treatment that would appear to have several benefits over the *1993 SNA* approach. Under the alternative treatment, amortization would be taken into account in income and saving measures, and a counterpart entry to the amortization would be made to account for the government's remaining interest in the spectrum.

The criteria developed in this paper for recognizing mobile phone licenses as assets are also applicable to other exclusive rights to undertake an activity or use a nonproduced asset (such as broadcasting licenses, commercial fishing rights, internet domain names, mining rights, emission rights, airport landing rights, and exclusive rights to operate certain types of businesses within a restricted area). While these cases are not explicitly dealt with in the *1993 SNA*,[28] they are covered by existing general principles, and so they do not require changes to the *1993 SNA*.

A more thorough review of the *1993 SNA*'s asset-liability boundary and, particularly, the treatment of rights and obligations conveyed by various contractual and licensing arrangements may, however, be needed for the following main reasons:

- More rights and obligations can amount to economic assets and liabilities within the *1993 SNA* asset boundary than are generally recognized.
- There can be counterintuitive effects on measured net worth for the total economy if these rights and obligations are not recognized as constituting assets and liabilities.
- The asset-liability boundary in business accounting is currently being reviewed.
- The current (reading of the) asset-liability boundary causes difficulties for designing proper statistical treatment of government build-operate-transfer or build-own-operate-transfer schemes (see Donaghue, 2002).

[28]In contrast, Eurostat (2002) explicitly recognizes this by stating ". . . it is proposed to treat receipts for granting permission, in cases where such permission is given exclusively to only one or a restricted number of units, as the sale by government of an intangible non-produced asset."

- The current (reading of the) asset-liability boundary causes difficulties for designing proper statistical treatment of securities repurchase agreements ("repos").

(See Annex I of Dippelsman and Mæhle (2001) for a further discussion of these issues.)

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