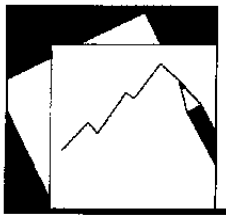
WP/01/72



IMF Working Paper

Treatment of Mobile Phone Licenses in the National Accounts

Robert J. Dippelsman and Nils O. Maehle

INTERNATIONAL MONETARY FUND

© 2001 International Monetary Fund WP/01/72

IMF Working Paper

Statistics Department

TREATMENT OF MOBILE PHONE LICENSES IN THE NATIONAL ACCOUNTS

Prepared by Robert J. Dippelsman and Nils Ø. Mæhle[1]

Authorized for distribution by Adriaan M. Bloem

May 2001

Abstract

The views expressed in this Working Paper are those of the author(s) and do not necessarily represent those of the IMF or IMF policy. Working Papers describe research in progress by the author(s) and are published to elicit comments and to further debate.

The treatment of license payments in the national accounts has become increasingly important in recent years; with mobile phone licenses being auctioned for substantial values in several countries. Because the text of the *System of National Accounts 1993* does not provide specific guidance on these licenses, their treatment needs to be decided on general principles. This paper concludes that there are usually two assets involved with mobile phone licenses, namely, 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. Alternative treatments of recording the license payments 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. An annex raises issues concerning the recognition of rights and obligations as assets and liabilities in national accounting.

JEL Classification Numbers: C82, H60, H62, H82

Keywords: National Accounts, Balance of Payments, Government Financial Statistics

Author's E-Mail Address: RDippelsman@imf.org; NMaehle@imf.org

---

[1] The authors are grateful to Adriaan Bloem, Paul Cotterell, Cornelis Gorter, Ann Harrison, Barbro Hexeberg, John Joisce, Martin Kellaway, Paul McCarthy, Brian Newson, John Pitzer, and Jan van Tongeren 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 to discuss the treatment of mobile phone licenses in the national accounts.

Contents Page

I. INTRODUCTION AND OVERVIEW

1. The treatment of mobile phone license payments in the national accounts has become increasingly important in recent years; for example, in several countries mobile phone licenses were auctioned for substantial values[2] and some other countries plan similar auctions. The text of the *System of National Accounts 1993* (*1993 SNA*) does not have specific guidance on these cases, consequently, the treatment needs to be decided on general principles and by analogy with other cases. The principles that apply to mobile phone licenses are also relevant to land and building leases, radio and television broadcast 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 (e.g., gambling and taxi licenses).

2. 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 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.

3. In Section II, three possible types of the mobile phone license arrangements are discussed, according to how the risks and benefits of **ownership over the right to use** the spectrum during the license period are allocated, namely:

(1) The risks and benefits of ownership are fully transferred to the licenseholder during the period. This would mean that the license is an asset in its own right, and that license payments should be recorded as for sale of the license asset from the government to the licenseholder;

(2) The risks and benefits of ownership are not transferred to the licenseholder. This would mean that any payments for the use of the spectrum are rent or rental;[3] or

---

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

[3] The term "rent" in the *1993 SNA* is reserved for payments for use of tangible nonproduced assets which are mainly land and subsoil assets, whereas payments for use of tangible produced assets under operating leases are described as "rentals." Rent is recorded as property income, while rentals are recorded as service payments.

(3) The risks and benefits of ownership are shared. This would mean that there is both creation of—with potential payments for—a license asset that transfers partial ownership over the right to use the spectrum and rent.

4. Each of these alternatives could arise with mobile phone licenses. However, the first option—as an asset—is typical of the initial issue of mobile phone licenses. The second option—as rent—is typical of licenseholders who allow other providers short-term access (in that case the payments typically would be rent or rentals, depending on whether the spectrum or produced assets such as transmission facilities were the major components). The third option—as both an asset and rent—applies in cases where licenses require continuing payments to the government based on subsequent revenue or profits, rather than being fixed in advance. The paper's conclusions are based on the principles outlined in the *1993 SNA* and general economic concepts. The conclusions follow the same principles as those adopted for land in the *1993 SNA*, because the spectrum and land share economic characteristics as nonproduced nonfinancial assets. The paper's conclusions are also consistent with the *International Accounting Standards* (IAS) *2000* treatment of such licenses as intangible assets.[4]

5. In Section III, three other options are considered and rejected for treating the license payments, namely:

(4) payments for purchase of the spectrum itself (this would be a valid option only if the license is for an infinite period);

(5) taxes; or

(6) payment for services.

6. Section IV of the paper deals with the treatment of the license over the remainder of its life. It notes the options for treating the decline in the value of the license to the licenseholder (that is, amortization) and the consequential rise in the value of the spectrum to the government (which is called reappearance of the value of the asset). The *1993 SNA* treatment is to record such changes in the value of a nonproduced asset in the other changes in volumes account. The paper suggests an alternative of recording them in the income accounts.

---

[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 Committee, *G4+1 Position Paper: Leases, Implementation of a New Approach,* London 2000). 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.

7. Annex 1 briefly raises questions about reviewing the treatment of rights and obligations conveyed by various contractual and licensing arrangements under the current *SNA* asset-liability boundary. A review of the current reading of the *SNA* asset-liability boundary is needed to properly account for certain operating lease arrangements, build-operate-transfer or build-own-operate-transfer schemes that are deliberately designed to circumvent current budget constraints and to avoid accounting or statistical reorganization of the long term rights and obligations conveyed.

8. In Annex 2, the numerical effects on the *1993 SNA* sequence of accounts are illustrated. It shows three alternatives: first, the *1993 SNA* treatment (mobile license issue as asset, amortization in other changes in volumes); second, the treatment of the license fee as prepaid rent; and, third, the suggested alternative (license as asset, amortization in the income accounts). In terms of impact on the main balancing items, under the *1993 SNA* treatment, the license has no effect on income or saving, but the whole initial payment is included in the capital account with a subsequent effect on net lending/net borrowing for that year. In contrast, under the second alternative, the initial payment is treated as prepaid rent and so would be shown in the financial account and would require imputations for interest flows, repayment of principal, and rent payments. These imputations would affect income, savings, and net lending/net borrowing for each year of the license. The third alternative has similar effects on income and saving as the rent case, but with the same effect on net lending/net borrowing as the *1993 SNA* treatment.

II. THE 1993 SNA TREATMENT OF MOBILE PHONE LICENSES

9. In Part A, it is first established that the electromagnetic spectrum meets the 1993 SNA criteria for recognition as an economic asset. Subsequently, there is a discussion of the three alternative types of arrangements recognized by the *1993 SNA* to cover the use of an asset by another entity for a limited period, namely, the sale of an independent asset (Part B), rent (Part C), or a combination of both (Part D).

A. Electromagnetic Spectrum as a Tangible Nonproduced Asset

10. The *1993 SNA* defines economic assets as "entities:

(a) Over which ownership rights are enforced by institutional units, individually or collectively; and
(b) From which economic benefits may be derived by their owners by holding them, or using them, over a period of time" (*1993 SNA* 10.2).[5]

[5] This definition parallels the *International Accounting Standards 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)).

11. 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 derives economic benefit from the spectrum by selling the right to use it. No value can reasonably be placed on the spectrum before 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.

12. The spectrum is 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 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 physical and measurable aspects of the spectrum also indicate that it should be regarded as tangible and not intangible. A consequence is that the spectrum should be treated like other tangible nonproduced assets such as land and subsoil assets.

13. 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 one particular technology that is expected to become obsolete, in which case the spectrum would have no residual value once its use was licensed. 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

14. 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). Following that definition, the permission to use an asset owned by another party becomes an asset when some of the benefits and risks of ownership 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.

---

[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).

15. More specifically, mobile phone licenses would fall within the *1993 SNA* definition of intangible nonproduced assets. The annex to Chapter 13 of the *1993 SNA* states that intangible assets are:

> *constructs of society.* They 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 consist of patented entities, leases and other transferable contracts, purchased goodwill and other intangible nonproduced assets. (AN 22 Intangible Nonproduced Assets. 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]

16. In cases where the license is an asset, the tangible asset (the spectrum) and derived intangible asset (the 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 the benefits and risks associated with the use of the spectrum is split between the 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, because the risks, control, and rights involved differ.

17. Important indications that some of the benefits and risks of ownership have been transferred and, thus, that an economic asset has been created include:

- **Limited cancellability.** Ownership over the benefits and risks from the right to use the underlying asset has not been transferred to the licenseholder if the license is subject to cancellation at the license issuer's discretion without a breach of the license conditions.

---

[7] Again the *1993 SNA* text parallels the *International Accounting Standards 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).

- **Degree of exclusiveness.** The economic benefits of ownership may be derived only if there is a significant amount of exclusivity. In effect, exclusivity is what is being purchased with these licenses.

- **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 preagreed value of license payments. Having a demonstrable value that may differ from the amount of preagreed license payments would be a compelling indication that the license is an asset.

- **Preagreed value of payments.** Preagreeing 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 risks associated with ownership to the licenseholder.

- **Length of the license**. The *1993 SNA* (and *IAS*) 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.

- **Licenseholder behaving as having obtained ownership over an asset**, as demonstrated by how the licenses are treated in their balance sheets, share values, and decision-making. 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.

18. 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, "economic benefits" would be need to be construed restrictively

[8] Preagreed 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 net present value can be established for payments by installments that are indexed but not so for payments that are adjustable to future market conditions.

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. Of course, lack of transferability makes a license less valuable and provides fewer opportunities to measure values in practice. However, most transferable licenses are only readily measured at the time of transfer and nontransferable licenses sold by auction can be measured at the time of issue.[9]

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

20. Land leases are similar in essence to spectrum licenses in that they give a right to use a tangible nonproduced asset. The *1993 SNA* treatments for payments for the use of land and spectrum are the same. The treatment of land leases is discussed in Box 1.

C. Rent

21. 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 a nonproduced nonfinancial tangible asset and analogous to "land and subsoil assets" and the spectrum is put at the disposal of the licenseholder, so this treatment is applicable to mobile phone arrangements that fall short of giving ownership over the right to use the spectrum to the licenseholder. Accordingly, if the mobile phone license does not transfer the risks and benefits of ownership to the licenseholder during the license period, then the payment for the license is rent.

---

[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 has proposed a five-year criterion in this case. (*Eurostat Decision on the Allocation of Mobile Phone Licenses (UTMTS)*. Eurostat news release July 14, 2000.)

Box 1. Land Leases

The treatment of payments for the use of the spectrum should be the same as for payments for the use of land. This result is necessary because the spectrum falls in the same asset category as land—tangible nonproduced assets. The *1993 SNA* recognizes that some land leases are current in nature while others are capital. Current leases of land give rise to property income in the form of rent—see *1993 SNA* 7.88, 7.128-131, and 10.129. Capital leases are independent assets for the leaseholder—see *1993 SNA* 10.129-130, 13.62, and Chapter 13 Annex AN.222, where examples mention transferable leases. Leases involving buildings are subject to the same principles, except that a current lease payment would be a payment for a rental service rather than property income.

Both current and capital leases have the common element of involving permission to use land owned by another entity. However, the *1993 SNA* provides very limited discussion of the borderline between putting the land at the disposal of another and transferring the ownership over the right to use land. From examples given, it is clear that transferable leases are assets (13.62), while short-term leases are usually current (7.88). In practice, property leases are most often current as they are short-term and give the landlord the right to cancel so that the landlord retains the full risks and benefits of ownership. In contrast with the spectrum, which cannot be vandalized or badly maintained, the protection of the owner's interest in the land often requires controls on the leaseholder's use of the property. At the other extreme, 99-year land leases typically give the leaseholder many rights similar to those of an owner except for the time limitation so that the leaseholder's interest amounts to ownership of an asset.

Applying general principles and the *1993 SNA* definition of economic assets (10.2), a lease asset must involve the leaseholder having enforceable ownership rights and economic benefits of ownership. In view of the *1993 SNA*'s use of transferable leases as examples, it might be tempting to adopt transferability as a single criterion, but nontransferable leases that give benefits of ownership other than transferability would still fall within the definition of economic assets. These cases of incomplete rights could be decided on a case by case basis, but it may be more convenient in practice to adopt a convention based on the length of the lease. In terms of real world arrangements, land and building owners will typically have current leases so as to maintain controls to protect their asset. Mobile phone licenses, however, are typically capital because the big investment required in building a network and customer base require a high degree of security of tenure. They would resemble more the case of 99-year and similar long-term leases, which give the leaseholder security of tenure over a long period to facilitate capital work on the land being carried out by the leaseholder. In some countries where the practice has been to treat all leases as current, there may be a need to review whether some are in fact capital leases.

The following example illustrates how long-term transferable leases can have a market price that is independent of the original purchase price, which 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 10 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 preagreed $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. As the lease continues over its term, the value of the owner's interest in the land would increase to the full market value of similar land, and the value of the lease in the leaseholder's hands would decrease to zero.

22. However, in practice, this situation is not usually the case for mobile phone licenses. Mobile phone licenses issued by governments typically confer ownership over the benefits and risks 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 net present value of the expected future larger profits obtained by having the license may differ from the amount of preagreed license payments, which is a compelling indication of the license being an asset because this aspect of the risks of ownership has been transferred to the licenseholder.

23. Some possible license arrangements, however, 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 unlimited 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. Another situation is license payments that relate to subsequent revenue or profits, so these payments would be rent if contractually agreed.[11]

24. The dividing line between putting an asset at the disposal of another unit (i.e., deriving rent) and selling a right to use the asset for a limited period (i.e., creating an asset in itself) may be difficult to draw in some instances. As noted in the discussion of assets, in the absence of transferability or other methods of valuation, a convention based on length of license may be needed. In the *1993 SNA* 7.88, the possibility of rent being 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.

25. If a license payment is regarded as rent and an up-front payment is made, under accrual principles, the up-front payment represents prepayment of rent and should be allocated over the life of the license, following the usual discounting principles, and not just to 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 these calculations is shown in Box 2.

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

D. Combined Asset/Rent Arrangements

26. In some cases, the arrangements have elements of ownership for both parties during the period of the contract. 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 where:

> 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[12]). ...The payments are property incomes and recorded as rent... . However, the holder of the concession or lease may be entitled, or permitted by the 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.

27. In such cases, a new intangible asset is created at the time of making the contract. The intangible asset may have a value of zero at the time of creation.[13] However, its value could subsequently be positive (or some cases negative) in response to later developments. Even though initially valued at zero, the intangible asset needs to be recognized as being created at that time as the leaseholder acquires some risks and benefits of ownership. The alternative of only recognizing the asset at the time of subsequent transfer confuses the point of creation of an asset with a point at which reliable non-zero valuation is possible. Coexistence of property income payments and a lease/license asset, as recognized in 10.129, can only occur in cases in which (1) the contract terms 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) the ownership over the rights to use is exchanged for another asset from which property income may be earned; because it is logically impossible for anyone to "rent" an asset that one owns the right to use.

28. 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. Under the gross treatment, the spectrum owner transfers the full 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—the claim on future sales or profits represent a financial liability of the licenseholder and the claim's net present value represent a part of the purchase price of

---

[12] Royalties—(a) a share of the product of 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*, tenth edition).

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

the license asset. Under the net treatment, the spectrum owner transfers only a partial ownership over the right to use the spectrum and retain some ownership from which property income may be earned—the performance based payments represent property income[14] and would not be part of the purchase price of the license asset. The two alternative approaches give the same effect on balancing items, (although some other items would be changed). The text of the *1993 SNA*—particularly paragraph 10.129—seems to imply the net treatment.[15]

E. Issues in Timing of Payment

29. Following accrual principles, the timing of payment(s) for a license is a financing issue and does not determine whether or not the license is an asset. In practice, however, business arrangements for payment will 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.

30. Broadly, there are three ways of paying for the license—a single up-front payment, regular payments at specified intervals, or a combination of the two. If the regular payments are determined in advance (fixed or indexed), they are part of the asset sale price, and the asset sale value is equal to any up-front payment plus the present value of all future regular payments, according to normal accrual principles. In that case, the regular payments represent interest and repayment of principal of an "other accounts payable" liability for the licenseholder to the issuer.[16]

31. The accrual-based time of recording 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.

F. Issues in Assets Classification

32. 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

---

[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.

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

[16] 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 net present value of the future preagreed payments is paid by the purchaser.

the same underlying asset. For example, a lease interest in land is shown in a different part of the classification to the full or residual ownership of the land (which are not distinguished).

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

- recognize that use of an asset for a fixed period and an unlimited period have economic similarities;

- recognize that the economic value for the society of the underlying asset is approximately[17] unchanged by leasing and licensing them 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; and

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

34. Fixed period leases and licenses should still be regarded as a separate category under headings for land, buildings, etc.; to reflect that 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. While this alternative classification is not envisaged in the *1993 SNA*, it may be useful for some kinds of analysis.

35. The same effect on economy-wide measures of total value by 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. However, the lessee/licensee's rights relate to only part of the property's economic life, and in the context of wealth measurement, the value of the assets recognized should reflect that the economic benefits relating to the legal owners 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.

---

[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).

III. OTHER TREATMENTS PROPOSED FOR LICENSE PAYMENTS

36. This section rejects three other options that have been discussed for treatment of license payments, namely:

A. Payments for purchase of full ownership over the spectrum;
B. Other taxes on production; and
C. Production.

A. Payments for Purchase of Full Ownership over the Spectrum

37. 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. Many mobile phone licenses cover the expected life of a particular technology, but there would need to be a certainty that no future technology could make economic use of the spectrum to say that the value of government's interest at the end of the licenses is zero.

38. One possible argument for treating the licenses as full ownership of the spectrum relies on extension of the principles applied to financial leases. In substance, 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 life of the asset. Economic ownership is generally the same as legal title to the asset. In some cases, spectrum licenses have been issued for an unlimited term, so that the license amounts to ownership of the spectrum. Although this has occurred for some radio and television licenses, mobile phone licenses have typically been issued for 15-30 years, in line with the expected life of third generation mobile phone technology, but the spectrum itself has a potentially infinite life in conjunction with future technologies.

39. One case where the *1993 SNA* recognizes that economic ownership occurs without legal title is for financial leases. 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 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. Financial leases typically are arranged by financing companies, bear all marks of being a financing arrangement, and cover most or all of the asset's expected service life. At the termination of the lease "*...the legal ownership is usually transferred to the lessee.*" (*1993 SNA* 6.118) for a preagreed 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.)

---

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

40. 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 have 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).

41. 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 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 licenses 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.[19] 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 government can reoffer use of the spectrum for another generation of licenses.[20] 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. While there is uncertainty about future uses, in general, demand for spectrum has tended to increase over time, although it is conceivable that a later technology could make some parts of the spectrum obsolete for any economic use. This situation shows that the government holds the risks and benefits of future changes in the usefulness of the spectrum.

B. Taxes on Production

42. 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

---

[19] 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.

[20] *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.

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 payment being a tax.

43. 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

44. 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 there is a payment for a service, then there should also be a corresponding produced asset. Therefore, there would need to be two production processes and products, first, to create the spectrum asset and, second, to produce the service of making it available.

45. 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

Box 2. Derivation of Rent, Interest, and Repayment of Financial Assets/Liabilities

If an up-front payment is classified as being for rent, rather than the purchase of the license, an annual value of rent would need to be derived. As well, that payment would be a financial asset for the licenseholder and a liability for the government (in the form of other accounts payable/receivable), and consequently would require interest and repayments to be imputed, the sum of which will constitute the imputed rent.

1993 SNA and economic concepts suggest that the annual allocation of an up-front rent payment must take into account a discount factor, rather than a simple straight line allocation—see for example, 13.34. (The *1993 SNA* refers to converting periodic payments to a net present value equivalent; the opposite calculation of converting a net present value to a periodic equivalent is required in this case but the same principles apply. While the principles of discounting is clear, the methods in national accounts practice are not well-established.)

The calculations are illustrated in the following example. An up-front payment of 2000 is made for a ten-year license; the license is paid and starts running on January 1 of the first year; the imputed rent, interest, and repayments are made on December 31; the values and interest rates are in real terms; the real interest/discount rate is assumed to be 10 percent; the annual value of rent is assumed to be equal each year in real terms.
The imputed annual value of rent can be derived from the following formula:

$$R = \frac{NVR \cdot r}{1-(1+r)^{-n}}$$

Where: R is annual rent
NVR is the net present value of the rent (given as 2000 by the prepayment)
r is the interest rate (0.10 in this example)
N is the number of years (10 in the example)

In this case, the annual rent is calculated as 325.

The imputed interest can then be derived as the outstanding debt multiplied by the interest rate. The implied repayment of the government's financial liability would be the imputed annual value of rent minus the imputed interest.

Year	Financial asset/liability (Jan 1)	Rent	Interest	Repayment	Financial asset/liability (Dec 31)
	(1)	(2)	(3) =0.10*(1)	(4)=(2)-(3)	(5)=(1)-(4)
1	2000	325	200	125	1875
2	1875	325	187	138	1736
3	1736	325	174	152	1585
4	1585	325	158	167	1418
5	1418	325	142	184	1234
6	1234	325	123	202	1032
7	1032	325	103	222	809
8	809	325	81	245	565
9	565	325	56	269	296
10	296	325	30	296	0

It should be noted that treating an up-front payment as covering rent in advance requires a number of assumptions to be made and a number of artificial transactions to be imputed. (Analogous calculations would need to be made if a license was an asset, but payments are made by installments.)

The treatment as rent in the *1993 SNA* sequence of accounts is illustrated in the annex.

hence patents were classified as nonproduced assets.[21] 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[22] [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

46. 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.

47. 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.

48. Associated with the amortization 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 licenses. Accordingly, as the licenses decline 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

---

[21] The *1993 SNA* paragraph 14.114 and the *Balance of Payments Manual (fifth 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.

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

[23] The *1993 SNA* paragraph 14.114 and the *Balance of Payments Manual (fifth 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.

and licenses, the income, saving, and net worth of the total economy are not 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 lease runs.

49. 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 *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 the annex. It is shown in the annex that, 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

50. 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 cannot be included.

51. 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; these terms convey the idea of a gradual, predictable process better than the *1993 SNA* terms which also cover unforeseen events. (As noted previously, there would be no reappearance of value only in the special case that the spectrum was expected to have no further use with any technology at any time in the future.)

52. 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. 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 as the license period runs. The balance between produced and nonproduced assets, however, is not affected.

B. An Alternative Treatment of Amortization/Reappearance of Assets

53. 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.[24] 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, it would be more consistent with the nature of the other changes in volume of assets account, which covers one-off, unpredictable events, rather than gradual processes that are an expected part of current business operations.

54. If included in the current accounts, amortization/reappearance would need to be shown in the income accounts with offsetting entries in the capital accounts. (These entries are illustrated in the asset alternative option in the annex.) 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. 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.

55. 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.

56. In the capital account, the offsetting entries would appear together with the acquisition less disposals of 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.

---

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

57. 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.[25] However, the method of calculation of amortization is the same as for consumption of fixed capital.

58. 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 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.[26] 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). This result is illustrated in the annex.

59. 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 on 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.

60. The alternative treatment seems to have several benefits 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. It would also avoid the possibility of income and saving measures being dramatically affected by small underlying changes in the details of the license arrangements.

---

[25] 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.

[26] 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.

V. SUMMARY AND CONCLUSIONS

(1) Mobile phone licenses that cover fixed long periods and give some security of tenure to the licenseholder are within the *1993 SNA* definition of an economic asset, specifically, an intangible nonproduced asset. However, payments received for some shorter term, nontransferable uses of spectrum may be classed as rent. In some cases, there may be both an independent license asset and continuing rent payments. A permanent license would represent a transfer of economic ownership over the spectrum itself and thus be a tangible nonproduced asset of the licenseholder, as the government would have no remaining economic ownership over the spectrum.

(2) The treatment for mobile phone licenses uses the same principles as leases of land.

(3) The treatments identified in the paper do not require changes in the *1993 SNA* as they are an application of existing principles to a new situation. The principles are also applicable to other intangible assets such as broadcasting licenses, fishing rights, and others listed in the introduction.

(4) The recognition of mobile phone licenses as assets for the licenseholders implies the recognition of the spectrum as an asset of the government, specifically, a tangible nonproduced asset. The only exception would be in the special case that the particular part of the spectrum has no possible future use with any technology subsequent to the end of the license.

(5) The license should be amortized over its life. Under the *1993 SNA*, the amortization is shown in the other changes in volumes account and does not affect income or saving. This paper considers the issues associated whether amortization should be taken into account in income and saving measures; as well as the counterpart entry to the amortization to account for the increasing value of the government's remaining interest in the spectrum.

REFERENCES

Commission of the European Communities, International Monetary Fund, Organisation for Economic Co-operation and Development, United Nations, and World Bank, *System of National Accounts 1993*, New York, United Nations, 1993.

Eurostat, *European System of Accounts, ESA 1995,* Luxembourg, 1996.

Eurostat, *Eurostat Decision on the Allocation of Mobile Phone Licenses (UTMTS).* Eurostat news release, July 14, 2000.

International Accounting Standards Committee, *International Accounting Standards 2000*, London January 2000.

International Accounting Standards Committee, *G4+1 Position Paper: Leases, Implementation of a New Approach,* London 2000.

International Monetary Fund, *Balance of Payments Manual,* fifth edition, Washington, September 1993.

Hill, Peter, "Intangible assets, patents and copyrights in the 1993 SNA," *SNA News and Notes.* Issue 6, July 1997. ISWGNA, New York. Available via the Internet at http://www.un.org/Depts/unsd/sna/sna6-en.htm#txt3

McGregor, Warren, "Accounting for Leases: A New Approach," *Financial Accounting Series* N0. 163-A, July 1996, U. S. Financial Accounting Standard Board.

Review of the *1993 SNA* Asset-Liability Boundary

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

- More rights to use an asset can amount to an asset within the *1993 SNA* asset boundary than currently recognized in practice; some with counterintuitive affects on measured net worth for the total economy.

- 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 treatments of government build-operate-transfer or build-own-operate-transfer schemes.

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

As discussed in this paper, rights to use an asset can amount to an asset within the *1993 SNA* asset boundary. Examples include land, a facility on it (leases, mining rights, airport landing rights), the sea or air (commercial fishing rights emission rights), the electromagnetic spectrum (for phone systems or broadcasting). In all these cases, in essence, the underlying asset is partitioned, and parts of its economic dimensions—the right to use it for a certain time—is sold, and the principles considered in this paper for mobile phone licenses are also applicable.

Some other licenses such as taxis and gambling licenses in restricted numbers can have a high value and may also amount to an asset within the *1993 SNA* asset boundary, but are not linked to any government-owned asset. Consequently, there may be an asset to the business but no reduction in the value of any of the government assets, so that the net worth of the total economy fluctuates with issuance and amortization of license assets, which some may find artificial or counterintuitive. If it was considered that social, net worth should not be affected by issuance of such licenses, alternatives such as recognizing as an asset the government's power to regulate or some sort of macro adjustments may have to be considered.

The IAS Committee is currently considering changes to the IAS for operating leases to record as asset and liabilities the rights and obligations conveyed by a lease.[27] The current IAS treatment of leases is the same as in the *1993 SNA*. Both standards requires radically

---

[27] IAS Committee, *G4+1 Position Paper: Leases, Implementation of a New Approach,* London 2000.

different accounting for arrangements classified as finance leases and those classified as operating leases. The IAS position paper concludes that the distinction between operating leases and finance leases is arbitrary and unsatisfactory, and that it draws a bright line between similar arrangements. The main deficiency noted is that existing standards do not provide for the recognition in lessees' balance sheets of assets and liabilities arising from operating leases. As a consequence of the deficiencies of the current standard, a practice have developed of structuring leases to avoid showing leased assets and the resulting liabilities on the balance sheet. A corresponding review of the *1993 SNA* treatment of operating leases may be appropriate when the IAS Committee has concluded its revision of the IAS standard for leases.

The IAS proposal raises further questions regarding the borderline between contracts that give rise to assets and liabilities and contracts that do not. Certain long-term service contract and purchase commitments may be viewed as in essence giving rise to assets and liabilities.

Under build-operate-transfer (BOT) or build-own-operate-transfer (BOOT) schemes, businesses create and operate traditionally public assets such as jails and roads. There is a commitment to transfer the assets to the government at the end of a long period and the businesses receive returns from the right to charge fees to the public or receive direct payments from government. Often, there are guarantees that transfer some risks to the government. In these cases, the government and business obtain rights and undertake obligations that are economically essential aspects of the transaction that are currently ignored in statistics. BOT/BOOT schemes are often designed to circumvent current budget constraints. The full impact on the government's fiscal position may be hidden unless the government's long term obligations are recognized as giving rise to a liability—something that the *1993 SNA* asset-liability boundary appears not to permit.

In financial markets, securities repurchase agreements ("repos") involve a sale of securities for cash with a commitment to repurchase the same or similar securities later at a fixed price. A security under a repo is owned by one party, but the promise to transfer it back means that the other party bears the risks and benefits of any changes in its price. However, this interest is not easily recorded in the absence of ownership of the instrument. The statistical treatment is under discussion, but recognition of an obligation to return the instrument and the right to receive it as liabilities and assets seems to be a possible way of proper measurement of the transaction.

Recording of Issue, Amortization, and Reappearance of Nonproduced Assets—A Numerical Example

Basic information:

- ✓ License issued on January 1, Year 1 for 10 years for 2000 currency units.
- ✓ All entries are valued in real terms. A discount rate of 2 percent is used.
- ✓ With the net present value of the license at time of inception of 2000, the annual value of expected future return is assumed to be equal each year in real terms, and that the real rate of interest is 2 percent (the real discount rate), then at the end of each year the net present value the expected future return on the asset will be equal to the value of the reminding financial asset/liability in box 2. Consequently, the theoretically correct annual amortization of the asset is equal to the annual repayment financial asset/liability in box 2 (that is following a geometrically increasing depreciation function).
- ✓ The annual flow from an up-front payment of 2000 to cover 10 years is 325 if the discount rate is 10% p.a. (The derivation is shown in the context of the rent in Box 2.)
- ✓ The discounted net present value of an infinite flow of 325 per year is 3255.
- ✓ The amortization is the decline in the present value, e.g., in year one, the difference between discounted flows of 325 p.a. for ten years and the same flow for nine years is 125.
- ✓ Only the entries representing changes from the reference situation are shown.

Alternative treatments:

1993 SNA:	Appearance, disappearance, and amortization are all included in other changes in volume of assets account.
Rent Option:	With imputations for rent, interest, and prepayment. (Note: this could apply in cases where the license was not an asset.)
Asset Alternative:	As for *1993 SNA*, except amortization and reappearance are a shown in the income and capital accounts.

Main differences in results:

Income and Savings

- ♦ The transactions do not affect income and saving balancing items under the *1993 SNA* treatment.
- ♦ The rent and the alternative treatments result in the same estimates for net property income received, primary and disposable income, and saving.
- ♦ Both the other treatments have the same effect on income and saving balancing items. The government and licenseholders have equal and opposite effects (e.g. +125 for government and -125 for licenseholders in Year 1) and no effect on the total.

Net lending/net borrowing

- ♦ Both the *1993 SNA* and alternative treatments have the same effect on net lending/net borrowing. In Year 1, net lending for the government is 2000 and net borrowing by licenseholders is 2000, canceling out for the total economy. In Year 2 and subsequent years, there is no effect.

- The Rent treatment results in smaller values of net lending by government and net borrowing by licenseholders each year (e.g., 183 in Year 1, 186 in Year 2). Again the effects cancel out for the total economy. The differences for net lending/net borrowing are caused by (a) the up-front payment being recorded in the financial account in the rent case, and in the capital account in the asset case; and (b) repayment/reappearance-amortization being recorded in the financial account in the rent case, and in the capital account in the asset case. This difference illustrates how net lending/net borrowing is sensitive to whether increases in net worth occurs through acquisition of financial or nonfinancial assets

Net worth

- Net worth is the same in all three treatments. Differences in the asset composition arise between the rent and the other two treatments because the rent treatment does not have the license as an asset.

Table 1. The 1993 SNA's Integrated Institutional Sector Accounts for Transactions

Year 1

Aggregated and simplified

Transaction	**Government**			**Licenseholder**			**Total**		
	Asset *1993 SNA*	Rent Option	Asset Alternative	Asset *1993 SNA*	Rent Option	Asset Alternative	Asset *1993 SNA*	Rent Option	Asset Alternative
Production									
Output, basic prices									
- Intermediate consumption									
= ***Gross value added***									
+ Taxes less subsidies on products									
= ***Gross Domestic Product***									
- Consumption of fixed capital									
= ***Net value added***									
= ***Net Domestic Product***									
Income and use of Income									
- Compensation of employees									
- Net taxes on products									
- Other net taxes on production									
= ***Operating surplus/ Mixed income, net***									
+ Compensation of employees									
+ Net taxes on productions									
+ Net property income received	0	125	125	0	-125	-125	0	0	0
+ Rent		325			-325			0	
+ Interest on other accounts payable/receivable		-200			200			0	
+ Reappearance of tangible nonproduced assets			**125**						**125**
- Amortization of intangible nonproduced assets						**125**			**125**
= ***Balance of Primary Income/National Income, net***	***0***	***125***	***125***	***0***	***-125***	***-125***	***0***	***0***	***0***
+ Current taxes on income and wealth									
+ Net other current transfers received									
= ***Disposable income, net***	***0***	***125***	***125***	***0***	***-125***	***-125***	***0***	***0***	***0***
- Final consumption expenditures									
= ***Net saving***	***0***	***125***	***125***	***0***	***-125***	***-125***	***0***	***0***	***0***

Table 1. The 1993 SNA's Integrated Institutional Sector Accounts for Transactions (concluded)

Year 1

Transaction	**Government**			**Licenseholder**			**Total**		
	Asset *1993 SNA*	Rent Option	Asset Alternative	Asset *1993 SNA*	Rent Option	Asset Alternative	Asset *1993 SNA*	Rent Option	Asset Alternative
Capital									
- Gross acquisition of produced assets									
+ Consumption of fixed capital									
- Acquisition less disposal of tangible nonproduced assets									
- Reappearance of tangible nonproduced assets			**125**						**125**
+ Acquisition less disposal of intangible nonproduced assets	-2000		-2000	2000		2000	0		0
- Amortization of intangible nonproduced assets						**125**			**125**
+ Net capital transfers receivable									
= ***Net lending(+)/Net borrowing(-)***	***2000***	***125***	***2000***	***-2000***	***-125***	***-2000***	***0***	***0***	***0***
Financial									
= Net acquisition of:									
+ Monetary gold and SDRs									
+ Currency and deposits from sale/purchase/prepayment of license	2000	2000	2000	-2000	-2000	-2000	0	0	0
+ Loans									
+ Shares and other equity									
+ Insurance technical reserves									
+ Financial derivatives									
+ Other accounts receivable (increase+/ decrease-)					1875			1875	
= Prepaid rent					2000			2000	
- Repayment of principal					125			125	
- Other accounts payable (increase+/decrease-)		1875						1875	
= Prepaid rent		2000						2000	
- Repayment of principal		125						125	

Table 2. The 1993 SNA's Integrated Institutional Sector Balance Sheets and Changes in Balance Sheets Accounts

Year 1

	Government			Licenseholders			Total		
	Asset *1993 SNA*	Rent Option	Asset Alternative	Asset *1993 SNA*	Rent Option	Asset Alternative	Asset *1993 SNA*	Rent Option	Asset Alternative
Opening Balance Sheets									
+ Produced assets									
+ Tangible non-produced assets									
+ Intangible non-produced assets									
+ Financial assets/liabilities, net									
= ***Net worth***									
Changes in net worth due to transactions									
Produced assets									
= Gross acquisition of produced assets									
- Consumption of fixed capital									
- Improvements to, and cost of ownership transfers on, nonproduced nonfinancial assets									
+ Tangible nonproduced assets (spectrum)			125						125
= Acquisition less disposals of nonproduced assets									
+ Improvements to, and cost of ownership transfers on, nonproduced nonfinancial assets									
+ Reappearance of tangible nonproduced nonfinancial assets			125						125
+ Intangible nonproduced assets (licenses)	-2000		-2000	2000		1875			125
= Acquisition less disposals of nonproduced assets	-2000		-2000	2000		2000	0		0
- Amortization of nonproduced assets						125			125
+ Financial assets/liabilities, net	2000	125	2000	-2000	-125	-2000	0	0	0
= Currency and deposits	2000	2000	2000	-2000	-2000	-2000	0	0	0
+ Other accounts receivable (increase+/ decrease-)					1875			1875	
- Other accounts payable (increase+/decrease-)		1875						1875	
= ***Changes in net worth due to transactions***	***0***	***125***	***125***	***0***	***-125***	***-125***	***0***	***0***	***0***

Table 2. The 1993 SNA's Integrated Institutional Sector Balance Sheets and Changes in Balance Sheets Accounts (concluded)

Year 1

	Government			Licenseholders			Total		
	Asset *1993 SNA*	Rent Option	Asset Alternative	Asset *1993 SNA*	Rent Option	Asset Alternative	Asset *1993 SNA*	Rent Option	Asset Alternative
Other changes in volume of assets									
Produced assets									
+ Tangible non-produced assets (spectrum)	1380	3255	1255				1380	3255	1255
= Appearance of tangible nonproduced nonfinancial assets	3255	3255	3255				3255	3255	3255
+ Reappearance of tangible nonproduced nonfinancial assets	125						125		
- Disappearance of tangible nonproduced nonfinancial assets	2000		2000				2000		2000
+ Other									
+ Intangible non-produced assets (licenses)	2000		2000	125			1875		2000
+ Appearance of intangible nonproduced nonfinancial assets	2000		2000				2000		2000
- Amortization of intangible nonproduced nonfinancial assets				125			125		
+ Other									
+ Financial assets/liabilities, net									
= ***Changes in net worth due to other changes***	***3380***	***3255***	***3255***	***-125***	***0***	***0***	***3255***	***3255***	***3255***
Revaluation									
Produced assets									
+ Tangible non-produced assets									
+ Intangible non-produced assets									
+ Financial assets/liabilities, net									
= Changes in net worth due to revaluation									
Closing Balance Sheets									
Produced assets									
+ Tangible non-produced assets	1380	3255	1380	0	0	0	1380	3255	1380
+ Intangible non-produced assets	0	0	0	1875	0	1875	1875	0	1875
+ Financial assets/liabilities, net	2000	125	2000	-2000	-125	-2000	0	0	0
= Currency and deposits	2000	2000	2000	-2000	-2000	-2000	0	0	0
+ Other accounts receivable					1875			1875	
- Other accounts payable		1875						1875	
= ***Net worth***	***3380***	***3380***	***3380***	***-125***	***-125***	***-125***	***3255***	***3255***	***3255***

Table 3. The 1993 SNA's Integrated Institutional Sector Accounts for Transactions

Year 2

Aggregated and simplified

Transaction	Government			Licenseholder			Total		
	Asset *1993 SNA*	Rent Option	Asset Alternative	Asset *1993 SNA*	Rent Option	Asset Alternative	Asset *1993 SNA*	Rent Option	Asset Alternative
Production									
Output, basic prices									
- Intermediate consumption									
= ***Gross value added***									
+ Taxes less subsidies on products									
= ***Gross Domestic Product***									
- Consumption of fixed capital									
= ***Net value added***									
= ***Net Domestic Product***									
Income and use of Income									
- Compensation of employees									
- Net taxes on products									
- Other net taxes on production									
= ***Operating surplus/ Mixed income, net***									
+ Compensation of employees									
+ Net taxes on productions									
+ Net property income received	0	138	138	0	-138	-138	0	0	0
+ Rent		325			-325		0	0	
+ Interest on other accounts payable/receivable		-187			187		0	0	
+ Reappearance of tangible nonproduced assets			**138**						**138**
- Amortization of intangible nonproduced assets						**138**			**138**
= ***Balance of Primary Income/National Income, net***	***0***	***138***	***138***	***0***	***-138***	***-138***	***0***	***0***	***0***
+ Current taxes on income and wealth									
+ Net other current transfers received									
= ***Disposable income, net***	***0***	***138***	***138***	***0***	***-138***	***-138***	***0***	***0***	***0***
- Final consumption expenditures									
= ***Net saving***	***0***	***138***	***138***	***0***	***-138***	***-138***	***0***	***0***	***0***

Table 3. The 1993 SNA's Integrated Institutional Sector Accounts for Transactions (concluded)

Year 2

Transaction	**Government**			**Licenseholder**			**Total**		
	Asset *1993 SNA*	Rent Option	Asset Alternative	Asset *1993 SNA*	Rent Option	Asset Alternative	Asset *1993 SNA*	Rent Option	Asset Alternative
Capital									
- Gross acquisition of produced assets									
+ Consumption of fixed capital									
- Acquisition less disposal of tangible nonproduced assets									
- **Reappearance of tangible nonproduced assets**			**138**						**138**
+ Acquisition less disposal of intangible nonproduced assets			0			0	0		0
- **Amortization of intangible nonproduced assets**			**0**			**138**			**138**
+ Net capital transfers receivable									
= ***Net lending(+)/Net borrowing(-)***	***0***	***138***	***0***	***0***	***-138***	***0***	***0***	***0***	***0***
Financial									
= Net acquisition of:									
+ Monetary gold and SDRs									
+ Currency and deposits									
+ Loans									
+ Shares and other equity									
+ Insurance technical reserves									
+ Financial derivatives									
+ Other accounts receivable (increase+/ decrease-)					-138			-138	
= Prepaid rent									
- Repayment of principal					138			138	
- Other accounts payable (increase+/decrease-)		-138						-138	
= Prepaid rent									
- Repayment of principal		138						138	

Table 4. The 1993 SNA's Integrated Institutional Sector Balance Sheets and Changes in Balance Sheets Accounts

Year 2

	Government			Licenseholders			Total		
	Asset *1993 SNA*	Rent Option	Asset Alternative	Asset *1993 SNA*	Rent Option	Asset Alternative	Asset *1993 SNA*	Rent Option	Asset Alternative
Opening Balance Sheets									
+ Produced assets									
+ Tangible non-produced assets	1380	3255	1380	0	0	0	1380	3255	1380
+ Intangible non-produced assets	0	0	0	1875	0	1875	1875	0	1875
+ Financial assets/liabilities, net	2000	125	2000	-2000	-125	-2000	0	0	0
= Currency and deposits	2000	2000	2000	-2000	-2000	-2000	0	0	0
+ Other accounts receivable					1875			1875	
- Other accounts payable		1875						1875	
= ***Net worth***	***3380***	***3380***	***3380***	***-125***	***-125***	***-125***	***3255***	***3255***	***3255***
Changes in net worth due to transactions									
Produced assets									
= Gross acquisition of produced assets									
- Consumption of fixed capital									
- Improvements to, and cost of ownership transfers on, nonproduced nonfinancial assets									
+ Tangible nonproduced assets (spectrum)			138						138
= Acquisition less disposals of nonproduced assets									
+ Improvements to, and cost of ownership transfers on, nonproduced nonfinancial assets									
+ Reappearance of tangible nonproduced nonfinancial assets			138						138
+ Intangible nonproduced assets (licenses)						138			138
= Acquisition less disposals of nonproduced assets							0		0
- Amortization of nonproduced assets						138			138
+ Financial assets/liabilities, net	0	138	0	0	-138	0	0	0	0
= Currency and deposits									
+ Other accounts receivable (increase+/ decrease-)					-138				
- Other accounts payable (increase+/decrease-)		-138							
= ***Changes in net worth due to transactions***	***0***	***138***	***138***	***0***	***-138***	***-138***	***0***	***0***	***0***

Table 4. The 1993 SNA's Integrated Institutional Sector Balance Sheets and Changes in Balance Sheets Accounts (concluded)

Year 2

	Government			Licenseholders			Total		
	Asset *1993 SNA*	Rent Option	Asset Alternative	Asset *1993 SNA*	Rent Option	Asset Alternative	Asset 1993 SNA	Rent Option	Asset Alternative
Other changes in volume of assets									
Produced assets									
+ Tangible non-produced assets (spectrum)	138						138		
= Appearance of tangible nonproduced nonfinancial assets							0		
+ Reappearance of tangible nonproduced nonfinancial assets	138						138		
- Disappearance of tangible nonproduced nonfinancial assets							0		
+ Other									
+ Intangible non-produced assets (licenses)				138			138		
= Appearance of intangible nonproduced nonfinancial assets							0		0
- Amortization of intangible nonproduced nonfinancial assets				138			138		
+ Other									
+ Financial assets/liabilities, net									
= ***Changes in net worth due to other changes***	***138***	***0***	***0***	***-138***	***0***	***0***	***0***	***0***	***0***
Revaluation									
Produced assets									
+ Tangible non-produced assets									
+ Intangible non-produced assets									
+ Financial assets/liabilities, net									
= ***Changes in net worth due to revaluation***									
Closing Balance Sheets									
Produced assets									
+ Tangible non-produced assets	1518	3255	1518	0	0	0	1518	3255	1518
+ Intangible non-produced assets	0	0	0	1737	0	1737	1737	0	1737
+ Financial assets/liabilities, net	2000	263	2000	-2000	-263	-2000	0	0	0
= Currency and deposits	2000	2000	2000	-2000	-2000	-2000	0	0	0
+ Other accounts receivable					1737			1737	
- Other accounts payable		1737						1737	
= ***Net worth***	***3518***	***3518***	***3518***	***-263***	***-263***	***-263***	***3255***	***3255***	***3255***