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TREATMENT OF MOBILE PHONE LICENSES IN THE NATIONAL ACCOUNTS

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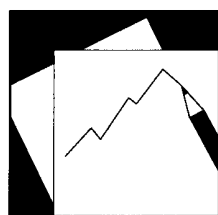
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IMF Working Paper

Treatment of Mobile Phone Licenses In the National Accounts

Robert Dippelsman and Nils Maehle

INTERNATIONAL MONETARY FUND

TREATMENT OF MOBILE PHONE LICENSES IN THE NATIONAL ACCOUNTS¹

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Draft IMF Working Paper

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Abstract

The treatment of license payments in the national accounts has become increasingly important in recent years; for example, in the United Kingdom mobile phone licenses were auctioned for substantial values 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 so that the treatment needs to be decided on general principles and by analogy with other cases. This paper concludes that in the U.K. case and other mobile phone license cases, there are usually two assets involved, namely the spectrum and the license. The spectrum is a tangible nonproduced asset owned by government, while the license is a separate intangible nonproduced asset, and the value of these two assets is linked. The alternative treatments for the license fee, namely, sale of the spectrum itself, other taxes on production, production of a service, and rent, are considered and rejected. The numerical effects through the 1993 SNA sequence of accounts of the main alternatives considered are shown in the annex.

JEL Classification Numbers: C82, H60, H62, H82

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1. Introduction and Overview

1. The treatment of license payments in the national accounts has become increasingly important in recent years; for example, in the United Kingdom mobile phone licenses were auctioned for substantial values and some other countries have had or plan similar auctions.² Other cases that have some common elements with mobile phone licenses include long-term lease contracts, radio and television broadcast licenses, commercial fishing rights, internet domain names, mining rights, emission rights, and the exclusive right to operate certain types of businesses within a restricted area (e.g., airport landing rights and taxi licenses).³ The text of the *System of National Accounts 1993 (1993 SNA)* does not have specific guidance on these cases so that the treatment needs to be decided on general principles and by analogy with other cases.
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 given time. The licenses may be allocated by an auction or by a “beauty contest.” If allocated through an auction, the holders usually pay a significant initial amount for the license, sometimes with installments in addition. In contrast, if 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 cancelable 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.
3. Five alternative treatments of the license payments are considered, namely as (1) creation and subsequent purchase/sale of an intangible nonproduced asset derived from an underlying tangible produced asset (the spectrum); (2) purchase/sale of the spectrum itself; (3) payment/receipt of taxes; (4) payment /sale for services, or (5) payment/receipt of rent.⁴ The choice between these alternatives depends on the circumstances, specifically whether:
 - a de facto unequivocal transfer of full ownership over the spectrum itself occurs or not—to distinguish (2) from the rest;
 - the payments are unrequited or not—to distinguish (3) from the rest;
 - a production process is carried out or not—to distinguish (4) from the rest;
 - a transfer of ownership over the associated risks and benefits from the rights to, all or specified, uses of an underlying asset takes place or not—to distinguish (5) from (1).

² In the U.K. the payments for licenses are roughly 2% of GDP in the year in which they were auctioned.

³ The national accounts treatment of these and other similar cases will be considered in a further paper, as part of a more fundamental review of national accounting concepts. Rights, licenses, and leases that constitutes assets may be seen as implying a set of corresponding obligations for the issuer. By including these obligations within the asset/liability boundary it would not be necessary to have artificial movements in value between the original and derived intangible asset and the links between rights and obligations could be clearly shown. These linked rights and obligations may be viewed as constituting a new class of assets/liabilities besides the current nonfinancial and financial classes.

⁴ The term "rent" is in the *1993 SNA* reserved for rents on land and subsoil assets, payments under operating leases are described as "rentals". Rent is recorded as property income, while rentals as service payments.

4. In section II of this paper, we conclude that in the U.K. and other mobile phone license cases, the spectrum is a tangible nonproduced asset owned by government, while the license is a separate intangible nonproduced asset, and the value of these two assets is linked. The paper's conclusion is supported by both the principles outlined in the 1993 SNA and general economic concepts. It is also consistent with the 1993 SNA treatment of long-term land leases as often constituting separate intangible nonproduced assets.⁵ The latter is important since the spectrum and land share economic characteristics as nonproduced nonfinancial assets and for that reason should be treated similarly.
5. The other four alternative treatments for the mobile phone license payments are considered and rejected in section III. Finally, section IV of the paper notes the options for treating the decline in the value of the license to the licensee (that is, amortization) and the rise in the value of the spectrum to the government (that is, reappearance). The arguments for and against the 1993 SNA treatment of recording them in the other changes in volumes account are discussed.
6. The numerical effects on the 1993 SNA sequence of accounts of the concluded treatment and two alternatives are shown in the annex. In terms of the main balancing items, the concluded treatment has no effect on income or saving, but includes the whole initial payment in the capital account with subsequent effect on net lending/net borrowing for that year. In contrast, treatment as prepayment of rent (which could apply in other circumstances) would include the whole initial payment in the financial account, thus the initial payment would have no effect on net lending/net borrowing in that year. Treatment as prepayment of rent requires imputations for interest flows, repayment of principal, and rent payments that would have an effect on income, savings, and net lending/net borrowing for each year. The alternative treatment of amortization and reappearance has the same effect on income and saving as the rent case, but the same effect on net lending/net borrowing as in the concluded treatment.

2. The Concluded Treatment: Electromagnetic Spectrum and Licenses as Economic Assets

7. In this section, we will discuss the definition of economic assets in the 1993 SNA and conclude that both the electromagnetic spectrum itself and the license to use it meet the 1993 SNA definition of economic assets. We conclude that effectively, the ownership over spectrum itself and ownership over the benefits and risks associated with its licensed use is split. Consequently, there are two linked assets, one held by the licensor and one by the licensee.
8. 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 The 1993 SNA explicitly mention transferable land leases as examples of nonproduced intangible assets, in 13.62 and in the annex to chapter 13. However, it is silent on the treatment of non-transferable land leases.

A. Electromagnetic Spectrum as a Tangible Nonproduced Asset

9. The electromagnetic spectrum is a natural asset owned by government that should be recognized as an economic asset at the time its commercial potential is established.⁶ Before the initial sale of the right to use the spectrum there is no value that can reasonably be placed on it. The government “owns” the spectrum through its general power to regulate, and can derive economic benefit from its ownership over the spectrum by selling the right to use it. Thus, the spectrum satisfies the definition of an economic asset.
10. The spectrum asset should be classified as a tangible nonproduced asset. The 1993 SNA defines tangible nonproduced assets as “... assets 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, so that pre-agreed license payments would then be either for the sale of an intangible nonproduced asset or rent (depending on circumstances discussed in section II.B and section III.D.)

B. Licenses as Intangible Nonproduced Assets

11. Like many of the cases listed in the introduction,⁷ mobile phone licenses appear to fit the 1993 SNA definition of intangible nonproduced assets, that is, they 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.”

(Annex to chapter 13 of the 1993 SNA defining AN 22 Intangible Nonproduced Assets. See also 13.62 and 13.63. Emphasis added in this and subsequent 1993 SNA quotations.)

12. The annex to chapter 13 of the 1993 SNA furthermore states that included in intangible nonproduced assets are:

“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.”

⁶ In the 1993 SNA, recognition is effected through the other changes in volume of assets account (12.19).

⁷ Especially long-term land leases.

13. Note that the examples given in the definition include fixed period contracts such as leases and patents, so that licenses with a finite period are included. It is also worth observing that the definition clearly includes first time granting of the license as creating an asset, and licenses as assets are not restricted to cases involving subsequent transfer to a third party. The definition of intangible nonproduced assets specifies that transferable contracts are assets, but, consistent with the general definition of assets in paragraph 10.2 of the 1993 *SNA*, does not require that the contracts must be transferable⁸ to constitute assets. Nontransferable contracts clearly can also come within the general definition of economic assets. The definition, furthermore, does not require the existence of any payment to obtain the asset,⁹ and does not exclude licenses whose market value is zero at time of issue from potentially being assets.
14. Important aspects to consider in judging whether a license meets the 1993 *SNA* definition of an economic asset include:
- **Cancellability.** Ownership over the benefits and risks from the right to use the underlying asset has not been transferred from the issuer to the holder if the license is subject to cancellation at the license issuer's discretion without a breach of the license conditions.
 - **Degree of exclusiveness.** The economic benefits may be derived only if there is a significant amount of exclusivity.
 - **Actual or de facto transferability.** The potential to resell the license is a compelling evidence that an entity exists over which ownership rights are enforced and thus is compatible only with treatment of the license as an asset. De facto transferability can arise if the licenseholder can be sold or taken over without automatic cancellation of the license. Transferability is a sufficient, but not a necessary, condition for the license to be a separate asset.
 - **Demonstrable value.** Even in the absence of transferability, the license may provide benefits to the owner and contribute positively or negatively to the net worth of the licenseholder company, and thus have a value that may differ from the amount of pre-agreed license payments, which is a compelling indication of the license being an asset.
15. Transferability is not a necessary condition because it does not preclude that economic benefits can be derived by holding the licenses. In practice, most licenses are transferable either directly (by the licenseholder selling the license to another business) or indirectly (through the licenseholder being acquired through a takeover). If further restrictions regarding transferability exist, e.g., that a license is transferred back to the government in case of a business takeover, the license should still be classified as an asset, although it becomes less valuable and may be hard or impossible to value in practice (such a restriction will be mirrored in a lower market value of the license).

⁸ In practice, nontransferable assets would be more difficult to measure, just as transferable assets may only be readily measured at the time of transfer. The April 2000 *ISWGNA* meeting confirmed that when the 1993 *SNA* was drafted, transferability was not seen as a condition for these contracts to be assets but as a practical condition to be able to measure their value. Any nontransferable mobile phone license sold by auction can be readily measured at the time of issue.

⁹ Applicable for assets obtained through "beauty contests," although again measurement is more difficult.

16. For nontransferable licenses, it may be difficult to judge whether they meet the above four criteria. In that case, a convention based on the length of the license may help delineate sale of asset 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 generally will be for long periods.
17. Licenses are often issued in association with another asset, for example, mobile phone licenses are issued in association with the spectrum. The licenses represent separate assets if they can have an independent ownership from the original underlying asset, and a value that may differ from the amount of any pre-agreed license payments (as illustrated in box 1 in the case of long-term land leases). The value of the residual interest in the underlying asset is reduced by the value of the license to which it is subject.

Box 1. Longterm Land Leases

Long-term noncancellable land leases can have value after they have been signed. It is quite possible that market prices will change in a manner that will make the ownership of a noncancellable lease more valuable than any initial upfront payment.

For example, the initial lease may have been for the use of a parcel of land for 10 years in exchange for a payment of \$100 per year (zero upfront payment). Two years later, the demand for this type of land has increased, but by the terms of the lease, the payment remains \$100 per year. Clearly, another party would be willing to pay the lease holder something for taking over the lease. In other words, the lease has taken on a value of its own that is independent of the preagreed \$100 annual payment. In addition, the potential sale value of the land may have gone up, but not as much as the increased demand for land would suggest as evidenced by the increase in the market value of similar land. In effect, part of the increased market value of similar land is captured by the leaseholder rather than the landowner. As the lease expires over its remaining term, the value of the owner's interest in the land will increase to the full market value of similar land and the value of the lease in the leaseholder's hands will decrease to zero.

C. Issues in Timing

18. The timing of payment(s) for a license is a financial issue and is not a relevant factor in determining whether or not the license is an asset.¹¹ Broadly, there are three ways of paying for the license – a one-off upfront 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 sale price, and the sale value is equal to any upfront payment plus the present value of all future regular payments, according to normal accrual principles. In that case, the regular

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.)

¹¹ However, in practice, business arrangements for payment will usually coincide with the passing of risk so that, for example, cancelable or short-term arrangements typically involve payments at specified intervals rather than a single upfront amount.

payments represent interest and repayment of principal on an “Other accounts payable” liability for the licenseholder to the issuer.¹²

19. Alternatively, subsequent payments could depend on performance, such as sales or profitability.¹³ Since these payments are not determined in advance, they cannot be treated as part of the sale price of an asset,¹⁴ but must be recorded as payments of a tax or rent, depending on the circumstances. If the subsequent performance-based payment requirements were imposed by legislation outside the license agreement, they would be taxes. However, if the requirements had been agreed as part of the auction or negotiation process, it is consensual and so could not be a tax. In such a case, the subsequent performance-based payments would be regarded as a rent. Such conditions imply that the license gave only partial or shared benefits from the use of the spectrum in that the government retained some elements of the benefits. However, this does not preclude the license from potentially being an asset if it meets the criteria established in section II.B. The value of the asset may be zero at time of inception if the performance based payments are not supplemented by any upfront and/or fixed or indexed preagreed periodic payment.
20. The accrual based time of recording is when the license is issued. In cases where the license takes effect sometimes 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.

3. Alternative Treatments Proposed for License Payments

21. Four other alternatives have been discussed for treatment of license payments in the national accounts, namely as (a) sales of the spectrum (b) other taxes on production; (c) production; or (d) rent.

A. Licenses as Transfer of Ownership Over the Spectrum

22. An alternative to the recommended treatment is to record the mobile phone licenses as a transfer of full ownership over the spectrum or partial ownership of the spectrum, rather than creating a separate asset in the form of the license. Two potential, but unconvincing, bases for recording the licenses as a transfer of full ownership over the spectrum would be (1) extension of the concept of financial leases; and (2) treatment of fixed-term licenses as complete ownership if the expiry is remote in time or outside the expected economic life of the asset. Both alternatives are unacceptable since they ignore the government’s interest in the spectrum. Effectively, the ownership over spectrum and benefits and risks associated with it’s licensed use is split, and the existence of two assets, one hold by the licensor and one by the licensee, have to acknowledged. A third alternative that recognizes that both the government and licenseholder have interests relating to the spectrum could be to classify licenses and leases in the same category as the underlying asset—that is, as a sale of parts of the economic dimensions of the underlying asset.

¹² If the license is sold to a third party, this liability typically is also transferred, and only the difference between the license value and the net present value of the future preagreed payments is paid.

¹³ As in the case of franchise type contracts.

¹⁴ The contract may still constitute an asset, in which case any up-front payment as well as any predetermined regular payments would constitute the sale price of the asset.

This third alternative is simply a matter of suggesting an alternative asset classification to that of the *1993 SNA*.

1) *Transfer of full ownership over the spectrum*

23. A full transfer of ownership over an asset occurs when the economic risks and benefits from all possible economic uses of the asset is transferred for the full life of the asset. Transfer of ownership is generally evidenced by a legal transfer of the title to the asset. The *1993 SNA* makes one exception, in the case of financial lease arrangements change of ownership from the lessor to the lessee is deemed to take place, even though legally the leased item remains the property of the lessor. However, mobile phone licenses fit neither the characteristics of financial lease arrangements, nor do they generally in any other way de facto transfer full ownership over the spectrum itself from the government to the licenseholder; only the right to use the spectrum for specified purposes and a specified time is typically transferred.
24. With a financial lease,¹⁵ a financier holds legal title to a piece of machinery or equipment, but the *1993 SNA* treats it as being effectively owned by the user, as the user has all the risks and benefits of ownership. 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 essence of the contract. Financial leases typically are arranged by financing companies, bear all marks of being a financing arrangement, cover most or all of the asset's expected service life, and at the termination of the lease "...**the legal ownership is usually transferred to the lessee.** . ." (*1993 SNA* 6.118) for a pre-agreed price. The lessor typically does not retain any de facto control over, or interest in, the leased good, except in the form of a financial claim, the leased good serves as security for the loan.
25. Mobile phone licenses cannot be treated as equivalent to a financial lease of spectrum for several reasons. Financial leasing is expressly limited to machinery and equipment in the *1993 SNA*. Further, the government's interest goes beyond having a loan security in that it maintains its full ownership subsequent to the expiry of the licenses. As well, in contrast to a financial lease, the government initially receives money from the licensee, rather than lending any money to the licensee, so upfront payments are in the opposite direction.
26. 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 cannot be treated as a de facto transfer of full ownership over the spectrum. The economic service life of the spectrum itself is infinite. Consequently, mobile phone licenses, typically transfer only a part, albeit in some cases the dominant part, of the risks and rewards of full ownership over the spectrum. 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 or zero, but the government still retains ownership over the spectrum.¹⁶ The

¹⁵ See *1993 SNA* 6.118 for further definition and explanation.

¹⁶ Similarly, a long-term land lease does not imply a transfer of ownership over the land, only the right to use it, 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.

government's continued ownership is evidenced among other things by its right to transfer its control over the spectrum, subject to the obligations in the license terms, to supranational authorities, and to sell the right to use the spectrum for purposes not covered by the terms of original licenses without prior agreement of the licenseholders. Also, as the remaining period of a license declines the value of the government's spectrum asset increases, so that after the license expires the spectrum returns to its original value and government can re-offer use of the spectrum for another generation of licenses.¹⁷

2) *Transfer of partial ownership over the spectrum*

27. An alternative could be to classify all rights to use an asset, which meets the criteria for being separate assets as set out in section II, according to the type of the underlying asset—that is, as a sale of parts of the economic dimensions of the underlying asset. Under this alternative, it would be possible to avoid record licenses and leases that transfer of part of the rights and benefits of using an underlying asset as a disappearance of parts of the underlying asset and creation of a new asset in the right to use it. 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 unchanged and avoid fluctuations in the values of asset types based on whether they are leased and how far through the lease they are, 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 issuing.
28. This alternative asset classification is inconsistent with the *1993 SNA*'s definition of intangible nonproduced assets as encompassing transferable leases and “...legal or accounting actions, such as ... the **conveyance of some economic benefit to a third party.**” In contrast, the *1993 SNA* gives a higher priority to separating original ownership and derived assets. While such a classification is not envisaged in the *1993 SNA*, it could be useful.

B. Taxes on Production

29. 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, since 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), the payments cannot be considered to be unrequited and, therefore, they 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.

¹⁷ *Ceteris paribus*. Of course, the value of the spectrum and license may rise and fall according to technological and economic developments.

30. 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

31. Production is “an activity carried out under the control and responsibility of an institutional unit 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. However, the electromagnetic spectrum is neither a produced asset nor intellectual property.

1) In the form of spectrum licensing service

32. 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 phones, the payments for these licenses are clearly out of proportion to any regulatory services provided.¹⁸

2) In the form of rental services

33. On basic principles, production of rental services occurs when a produced asset-not a nonproduced 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, first, to create the asset and, second, to produce the service of making it available.
34. However, the 1993 SNA deviates from this basic principle in the case of intellectual property, which is classified as a nonproduced asset--the payment for the use of patents, copyrights, trademarks, franchises, etc. is treated as a payment for a service.¹⁹ From the text and historical evolution of the 1993 SNA, it is known that there was an intention to treat payments for use of patents etc. as a payment for a service, while classifying the original assets - the patents, etc. – as nonproduced assets. This treatment resulted from a late decision in the 1993 SNA drafting process not to capitalize research and development expenses. Moreover, although research and

¹⁸ If the payment is for a service, the producers and products involved in the production process need to be identified and classified, namely spectrum production and spectrum services.

¹⁹ 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.

development is not capitalized, it is still recognized in the 1993 SNA as arising from a productive activity²⁰.

35. It is difficult to see that the mobile phone licenses involve any produced asset or intellectual property being put at the disposal of another unit. Both the spectrum and the license are nonproduced assets, and it is the spectrum space that is made available to another unit. It would not be desirable to extend the anomaly of nonproduced assets giving rise to production to cases not involving intellectual property.

D. Rent

36. 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). This description may seem to apply since 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 licenseeholder.
37. Payments for licenses that provide exclusive rights can be rent or acquisition of an asset depending on whether ownership over benefits and risks is transferred from the issuer to the licenseeholder. As indicated in section II above, the definition of an asset is that there is a separate entity is created for “which ownership rights are enforced ... and ... from which economic benefits may be derived by their owners by holding them, or using them, over a period of time.” Accordingly, if the mobile phone license does not confer ownership over the risks and benefits, derived from the exclusive rights to all, or specified, uses of the underlying asset, the payment would be rent. For example, if the license gave exclusive rights to use the spectrum but was contractually cancelable at any time by the government, it would not constitute an entity for which ownership rights are enforced and thus would not be an asset.
38. Drawing the 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 in some instances. While transferability implies a potential resale value that clearly precludes rent, long-term nontransferable licenses may also qualify as an asset in terms of providing benefits to the owner and contributing positively or negatively to the net worth of the licenseeholder company. 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, e.g., because it was cancelable at the landlord’s discretion.
39. If a license payment is regarded as rent and an upfront payment is made, under accrual principles, the upfront payment represent prepayment of rent and should be allocated over the life of the license, following 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 a discount rate. These calculations are shown in box 2.

²⁰ Recorded as output and intermediate consumption.

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

If an upfront 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.

The calculations are illustrated in the following example. An upfront 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 rate of interest is assumed to be 2 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: $R = \frac{NVR}{r} \left[1 - (1+r)^{-n} \right]$

- 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 (0.02 in this example)
- N is the number of years (10 in the example)

In this case, the annual rent is calculated as 223.

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) = 0.02*(1)	(4) = (2) - (3)	(5) = (1) - (4)
1	2000	223	40	183	1817
2	1817	223	36	186	1631
3	1631	223	33	190	1441
4	1441	223	29	194	1247
5	1247	223	25	198	1049
6	1049	223	21	202	848
7	848	223	17	206	642
8	642	223	13	210	432
9	432	223	9	214	218
10	218	223	4	218	0

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

4. Amortization of The Value of the License and Reappearance of the Value of the Spectrum

40. 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 government's residual interest as the remaining period of the license declines.
41. Amortization is the entry in business and national accounting that deals with the gradual extinguishing, or decline in value, of an asset such as fixed term licenses as well as goodwill, patents, and other intangible nonproduced assets with finite lives. In the mobile phone case, as the license declines in value, the value to the government of the spectrum increases correspondingly, so in the national accounts there needs to be an offsetting entry in the government accounts. In this paper, this value is called the reappearance of the value of the spectrum. As a result of the complementarity between the two assets, the income, saving, and estimated net worth of the total economy should not be affected by the timing of the license or the method of amortization, only the distribution between the government and the licenseholder.
42. In this section, we will discuss two treatments of the amortization of the value of the license and 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). Both possibilities are illustrated for the 1993 SNA's sequence of accounts in the annex. It is shown in the annex that, under certain conditions, the alternative treatment results in identical numbers as for the treatment as rent for all main aggregates except net lending/net borrowing.

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

43. 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. However, consumption of fixed capital, as defined in the 1993 SNA 6.179, is specifically limited to produced assets, so licenses cannot be included.
44. The corresponding increase in the value of the underlying asset to the government is not mentioned specifically in the 1993 SNA. However, as it is the converse of amortization, it should be included under "economic **appearance** of nonproduced assets." More specifically, it is a "reappearance" of value that had previously been held by the licenseholder.
45. 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." 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 tangible and intangible assets changes as the license period runs.

B. An Alternative Treatment of Amortization/Reappearance of Assets

46. An alternative to the 1993 SNA treatment would be to include the effect of amortization/reappearance of assets under net property income in the current accounts rather than in the other changes in volume of assets account. 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 earning income. It would also be consistent with the business accounting practice of treating amortization as a cost. That treatment would also be more consistent with the nature of the other changes in volume of assets accounts which generally covers one-off, unpredictable events, rather than gradual processes that are an expected part of current business operations.
47. 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 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, other cases of economic appearance and disappearance would remain as other changes in volume of assets.
48. The entries for amortization/reappearance in the income accounts could appear within the property income items. Although not literally property income paid or received, amortization/reappearance are analogous to the rent that would have been paid and received if the asset had been rented rather than sold. As well, their inclusion as part of property income would avoid the need to add a new, but generally 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.
49. In the capital account, the offsetting entries would appear together with the acquisition less disposals of the relevant asset types, with amortization being under intangible assets and reappearance being under tangible assets. This offsetting entry in the capital account is like the entry for consumption of fixed capital and is a consequence of double entry accounting. As a result, net lending /net borrowing is the same under both the 1993 SNA and the presented alternative treatment of amortization/reappearance.
50. The alternative treatment of amortization/reappearance in the accounts would still differ in some ways from the treatment of consumption of fixed capital. Amortization of licenses differs from consumption of fixed capital in requiring 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.²¹ However, the formula for calculation of amortization would be similar to that of consumption of fixed capital, as would the offsetting entry in the capital account which leaves net lending/net borrowing unaffected.

²¹ Amortization of intellectual property such as patents and copyrights appears to be different to licenses in that they arise from a production process and the underlying knowledge cease to be an economic asset at the end of their lives, and arguably could be treated exactly like consumption of fixed capital.

51. A desirable result of the alternative treatment would be that the national accounts income and saving items would be the same, under some conditions, whether the license payments had been treated as rent or as acquisition of an asset. This result is illustrated in the annex. The required conditions are 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 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.²² 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 are in the form of nonfinancial assets (such as the license) or financial assets (such as prepayment of spectrum rent).
52. The alternative treatment seems to have several benefits over the *1993 SNA* treatment. 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.

²² 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.

References

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Annex

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 upfront payment of 2000 to cover 10 years is 223 if the discount rate is 2% 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 223 per year is 11150.
- ✓ The amortization is the decline in the present value, e.g., in year one, the difference between discounted flows of 223 p.a. for ten years and the same flow for nine years is 183.
- ✓ Only the entries representing changes from the reference situation are shown.

Alternative treatments:

<i>1993 SNA:</i>	Appearance, disappearance, and amortization are all included in other changes in volume of assets account.
Rent:	With imputations for rent, interest, and prepayment. (Note: this could apply in cases where the license was not an asset.)
Alternative treatment:	As for <i>1993 SNA</i> , 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. +183 for government and -183 for licenseholders in the 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 upfront 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
<u>Production</u>									
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									
<u>Income and use of Income</u>									
- Compensation of employees									
- Net taxes on products									
- Other net taxes on production									
= Operating surplus/Mixed income, net									
+ Compensation of employees									
+ Net taxes on productions									
+ <u>Net property income received</u>	0	183	183	0	- 183	- 183	0	0	0
+ Rent		223			-223			0	
+ Interest on other accounts payable/receivable		- 40			- 40			0	
+ Reappearance of tangible non-produced assets									183
- Amortization of intangible non-produced assets			183			183			183
= Balance of Primary Income/National Income, net	0	183	183	0	- 183	- 183	0	0	0
+ Current taxes on income and wealth									
+ Net other current transfers received									
= Disposable income, net	0	183	183	0	- 183	- 183	0	0	0
- Final consumption expenditures									
= Net saving	0	183	183	0	- 183	- 183	0	0	0

Table 1 continued

The 1993 SNA's Integrated institutional Sector Accounts for Transactions

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 non-produced assets									
- Reappearance of tangible non-produced assets			183						183
+ Acquisition less disposal of intangible non-produced assets	- 2000		- 2000	2000		2000	0		0
- Amortization of intangible non-produced assets						183			183
+ Net capital transfers receivable									
= <i>Net lending (+)/Net borrowing(-)</i>	2000	183	2000	- 2000	- 183	- 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									
+ <u>Other accounts receivable (increase+/decrease-)</u>					1817			1817	
= Prepaid rent					2000			2000	
- Repayment of principal					183			183	
- <u>Other accounts payable (increase+/decrease-)</u>		1817						1817	
= Prepaid rent		2000						2000	
- Repayment of principal		183						183	

Table 2

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

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
Opening Balance Sheets									
+ Produced assets									
+ Tangible non-produced assets									
+ Intangible non-produced assets									
+ Financial assets/liabilities, net									
= <i>Net worth</i>									
Changes in net worth due to transactions									
Produced assets									
= Gross acquisition of produced assets									
- Consumption of fixed capital									
- Improvements to, and cost of ownership transfer on non-produced non-financial assets									
+ <u>Tangible non-produced assets (spectrum)</u>			183						183
= Acquisition less disposals of non-produced assets									
+ Improvements to, and cost of ownership transfer on non-produced non-financial assets									
+ Reappearance of tangible non-produced non-financial assets			183						183
+ <u>Intangible non-produced assets (licenses)</u>	- 2000		- 2000	2000		1817			183
= Acquisition less disposals of non-produced assets	- 2000		- 2000	2000		2000	0		0
- Amortization of non-produced assets						183			183
Financial assets/liabilities, net	2000	183	2000	- 2000	- 183	- 2000	0	0	0
= <i>Changes in net worth due to transactions</i>	0	183	183	0	- 183	- 183	0	0	0

Table 2 continued

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

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
<u>Other changes in volume of assets</u>									
+ Produced assets									
+ Tangible non-produced assets (spectrum)	<u>9333</u>	<u>11150</u>	<u>9150</u>				<u>9333</u>	<u>11150</u>	<u>9150</u>
= Appearance of tangible non-produced non-financial assets	11150	11150	11150				11150	11150	11150
+ Reappearance of tangible non-produced non-financial assets	183						183		
- Disappearance of tangible non-produced non-financial assets	2000		2000				2000		2000
+ Other									
+ Intangible non-produced assets (licenses)	<u>2000</u>		<u>2000</u>	<u>183</u>			<u>1817</u>		<u>2000</u>
+ Appearance of intangible non-produced non-financial assets	2000		2000				2000		2000
- Amortization of intangible non-produced non-financial assets				183			183		
+ Other									
+ Financial assets/liabilities, net									
= Changes in net worth due to other changes	11133	11150	11150	- 1830	0	0	11150	11150	11150
<u>Revaluation</u>									
Product assets									
+ Tangible non-produced assets									
+ Intangible non-produced assets									
+ Financial assets/liabilities, net									
= Changes in net worth due to revaluation									
<u>Closing Balance Sheets</u>									
Produced assets									
+ Tangible non-produced assets	9333	11150	9333	0	0	0	9333	11150	9333
+ Intangible non-produced assets	0	0	0	1817	0	1817	1817	0	1817
+ Financial assets/liabilities, net	2000	183	2000	- 2000	- 183	- 2000	0	0	0
= Net worth	11133	11133	11133	- 183	- 183	- 183	11150	11150	11150

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
<u>Production</u>									
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									
<u>Income and use of Income</u>									
- Compensation of employees									
- Net taxes on products									
- Other net taxes on production									
= Operating surplus/Mixed income, net									
+ Compensation of employees									
+ Net taxes on productions									
+ <u>Net property income received</u>	0	187	187	0	- 187	- 187	0	0	0
+ Rent		223			223		0	0	
+ Interest on other accounts payable/receivable		- 36			- 36		0	0	
+ Reappearance of tangible non-produced assets			187						187
- Amortization of intangible non-produced assets						187			187
= Balance of Primary Income/National Income, net	0	187	187	0	- 187	- 187	0	0	0
+ Current taxes on income and wealth									
+ Net other current transfers received									
= Disposable income, net	0	187	187	0	- 187	- 187	0	0	0
- Final consumption expenditures									
= Net saving	0	187	187	0	- 187	- 187	0	0	0

Table 3 continued

The 1993 SNA's Integrated Institutional Sector Accounts for Transactions

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 non-produced assets									
- Reappearance of tangible non-produced assets			187						187
+ Acquisition less disposal of intangible non-produced assets			0			0	0		0
- Amortization of intangible non-produced assets			0			187			187
+ Net capital transfers receivable									
= <i>Net lending (+)/Net borrowing(-)</i>	<i>0</i>	<i>187</i>	<i>0</i>	<i>0</i>	<i>- 187</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>
Financial									
= Net acquisition of:									
+ Monetary gold and SDRs									
+ Currency and deposits from sale/purchase/prepayment of license									
+ loans									
+ Shares and other equity									
+ Insurance technical reserves									
+ Financial derivatives									
+ <u>Other accounts receivable (increase+/decrease-)</u>									
= Prepaid rent									
- Repayment of principal									
- <u>Other accounts payable (increase+/decrease-)</u>									
= Prepaid rent									
- Repayment of principal									
			187						187

Table 4

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

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
Opening Balance Sheets									
+ Produced assets									
+ Tangible non-produced assets	9333	11150	9333	0	0	0	9333	11150	9333
+ Intangible non-produced assets	0	0	0	1817	0	1817	1817	0	1817
+ Financial assets/liabilities, net	2000	183	2000	- 2000	- 183	- 2000	0	0	0
= <i>Net worth</i>	11133	11133	11133	- 183	- 183	- 183	11150	11150	11150
Changes in net worth due to transactions									
Produced assets									
= Gross acquisition of produced assets									
- Consumption of fixed capital									
- Improvements to, and cost of onership transfer on non-produced non-financial assets									
+ <u>Tangible non-produced assets (spectrum)</u>			187						187
= Acquisition less disposals of non-produced assets									
+ Improvements to, and cost of ownership transfer on non-produced non-financial assets									
+ Reappearance of tangible non-produced non-financial assets			187						187
+ <u>Intangible non-produced assets (licenses)</u>						187			187
= Acquisition less disposals of non-produced assets							0		0
- Amortization of non-produced assets						187			187
Financial assets/liabilities, net	0	187	0	0	- 187	0	0	0	0
= <i>Changes in net worth due to transactions</i>	0	187	187	0	- 187	- 187	0	0	0

Table 4 continued

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

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
<u>Other changes in volume of assets</u>									
+ Produced assets									
+ Tangible non-produced assets (spectrum)	187						187		
= Appearance of tangible non-produced non-financial assets								0	
+ Reappearance of tangible non-produced non-financial assets	187						187		
- Disappearance of tangible non-produced non-financial assets								0	
+ Other									
+ Intangible non-produced assets (licenses)				187			187		
+ Appearance of intangible non-produced non-financial assets								0	0
- Amortization of intangible non-produced non-financial assets				187			187		
+ Other									
+ Financial assets/liabilities, net									
= Changes in net worth due to other changes	187	0	0	- 187	0	0	0	0	0
<u>Revaluation</u>									
Product assets									
+ Tangible non-produced assets									
+ Intangible non-produced assets									
+ Financial assets/liabilities, net									
= Changes in net worth due to revaluation									
<u>Closing Balance Sheets</u>									
Produced assets									
+ Tangible non-produced assets	9520	11150	9520	0	0	0	9520	11150	9707
+ Intangible non-produced assets	0	0	0	1630	0	1630	1630	0	1817
+ Financial assets/liabilities, net	2000	370	2000	- 2000	- 370	- 2000	0	0	0
= Net worth	11520	11520	11520	- 370	- 370	- 370	11150	11150	11524