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Towards the 2025 System of National Accounts:
Measuring intangible assets and natural capital in 2025 System of National Accounts

Challenges of Production Boundary for Intangible Assets

Prepared by Central Bank of Hungary[1]

Summary

Intangible assets play important role in the process of globalisation, digitalisation and environment protection. Therefore, it is important to clarify and understand their statistically appropriate recording. First, sales of intangible assets are usually not considered as production since they are mainly handled as fixed assets. It is, however, possible that intangible assets, like many tangible assets, are bought and held for sale, so they would be handled as inventories. In this case their sales can fall within the production boundary (and under FDI incomes). Second, intangible assets may be non-produced. It is important to recognise when they appear since if they are held for sale, their sales can fall within the production boundary. In the case of emission permits there is a methodological gap here since they also can be traded in the market but at their issuance, they are recommended to be taxes instead of non-produced non-financial assets. Third, it is important to recognise that production processes, even merchanting activities, are operated by living persons. If in the resident economy a firm, formally performing production activities, has no or only few employees, it will raise a question where the production really takes place. Resident Special Purpose Entities (SPEs) are treated as economic owners of assets they formally operate or sell but it may be only a practical and not an economically justified solution. Although production boundary, and so GDP, may be expanded in this way, their inward FDI stocks, possibly covering intangible assets on the asset side, may be excluded from economically meaningful figures which, if happens, will be contradictory.

[1] Prepared by Peter Banhegyi, Magyar Nemzeti Bank, Hungary (banhegyip@mnb.hu).

I. Introduction

1. The growing importance of intangible assets is the concomitant of the recent globalisation and digitalisation of our world. These assets can help production processes, so the level and value of production can be increased. Receipts from use of these assets are recorded on production account. Moreover, their contribution to value added has generally grown to a higher degree than the value added of tangible assets along the production chain. Their purchase and sell, however, are usually not included in production account.

2. As all kinds of assets, in general, intangible assets also can be divided between produced and non-produced assets. For produced assets, purchase and sell of intangible assets are mainly discussed as part of (gross) fixed capital formation, and for non-produced assets, mainly as capital account transactions (both in national accounts and balance of payments). Moreover, there is much debate on whether some instruments are recorded under capital account or primary incomes.

3. This has a consequence on primary income account, too (also both in national accounts and balance of payments). Value added resulted from use of these intangible assets is transferred to owners of these assets on allocation of primary income account while purchase and sell of these assets are usually considered to be out-side of this allocation.

4. The picture, however, may be more complex. This discussion does not take in account of intangible assets held for sale and/or owned by Special Purpose Entities (SPEs). On the one hand, these assets may be not only means of production processes but also assets for trade, and, on the other hand, considering the value added resulted from them owned by SPEs as resident may lead to contradictions. The following chapters will discuss these issues and conclude that they should be included more explicitly in new manuals.

II. Challenges for intangible assets held for sale

5. One of standard classification of assets in national accounts consists of three categories: fixed capital formation, inventories, and dwellings. Produced intangible assets are usually discussed under the first category since their primary goal is to increase both the quantity and quality of goods and services provided for users. In this case these intangible assets are fixed assets, and their purchases are considered as investments. Non-produced intangible assets should not be fixed assets (since fixed assets should be produced assets, see System of National Accounts, 2008 (2008 SNA), paragraph 10.11), they are simply classified as non-produced non-financial assets in capital account. In some cases, mainly for permits to undertake a specific activity (e.g., emission permits by the government), it is also a question whether these permits should be recorded as assets or as taxes on production (see 2008 SNA, paragraphs 17.352-367).

6. Tables 1-4 show these issues. These tables contain only relevant items, not the whole sequence of accounts and instruments. Issues of dividends, valuation and time of recording are also left out of account. Table 1 includes the case of produced intangible assets. Consider a resident firm who is fully owned by non-residents. Investors provide direct investment of 1000 for this resident firm in the form of produced intangible asset. This asset is recorded as fixed capital formation (consumption of fixed capital is also not discussed here) which arrives from abroad. With the help of this asset this firm provides services of 100 for users from which 70 is ex-ported, 30 is used by residents (intermediate consumption is also not discussed here). The firm employs residents and pays compensation of 30 for them. In the end the firm has profits of 70 (taxes on profits are also not important here) which are attributed to its non-resident owner and reinvested by them.

7. It can be seen, that imports of intangible assets are excluded from production and income account since these are investments. i.e., fixed capital formation[2]. The rest of the world column shows the balance of payments part of national accounts where, however, in

[2] This is the consequence of current operating performance concept (COPC) which is applied to recording if Foreign Direct Investment (FDI) incomes in balance of payments.

balance of payments the purchased of intangible assets of 1000 from abroad should be recorded as imports of goods and services.

Table 1
Produced intangible assets in fixed assets

	Uses						Resources					
	Govern-ment	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*	*Govern-ment*	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*
	Production account											
Exports of goods & services				70		70					70	70
Imports of goods & services												
Output					100	100		100	100			100
	Generation of income account											
Compensation of employees		30	30			30						
Taxes on production												
	Allocation of primary income account											
Reinvested earnings on FDI										70		70
	Changes in assets						**Changes in liabilities**					
	Govern-ment	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*	*Govern-ment*	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*
	Capital account											
Fixed capital formation		1000	1000			1000				1000	1000	1000
Changes in inventories												
Non-produced assets												
	Financial account											
Equity				1070		1070						
Other accounts										70		70
	Other changes in volume											
Fixed capital formation												
Changes in inventories												
Non-produced assets												
Equity												
Other accounts												

Table 2
Emission permits as taxes on production

	Uses						Resources					
	Govern-ment	Non-go-vernment	Resident economy	Rest of the world	Goods & services	Total	Govern-ment	Non-go-vernment	Resident economy	Rest of the world	Goods & services	Total
	Production account											
Exports of goods & services												
Imports of goods & services												
Output												
	Generation of income account											
Compensation of employees												
Taxes on production		200	200			200	200		200			200
	Allocation of primary income account											
Reinvested earnings on FDI												
	Changes in assets						Changes in liabilities					
	Govern-ment	Non-go-vernment	Resident economy	Rest of the world	Goods & services	Total	Govern-ment	Non-go-vernment	Resident economy	Rest of the world	Goods & services	Total
	Capital account											
Fixed capital formation												
Changes in inventories												
Non-produced assets												
	Financial account											
Equity												
Other accounts	200	-200	0			0						
	Other changes in volume											
Fixed capital formation												
Changes in inventories												
Non-produced assets		200	200			200						
Equity												
Other accounts												

8. Tables 2-4 show the case of non-produced intangible assets and the debate on emission permits by government. Consider another resident firm who buys emission permits of 200 from the resident government. 2008 SNA is not totally clear as regards recording of these permits since, on the one hand, they are rather taxes (since atmosphere recently is not an economic asset), on the other hand, they may be tradable so they can be classified as assets. Wellbeing and Sustainability Task team (WSTT) released a guidance note (WS.7) on this issue discussing basically three options for emission permits at the time of issuance: taxes on production (in this case the resident firm pays taxes but later these permits can be reclassified as assets if they are tradable), non-produced non-financial asset and financial asset (in this last case taxes are recorded at the time of surrender)[3]. Non-produced non-financial assets arise through other changes in volume in the first two cases. In the case of financial assets there is neither tax nor asset at the time of issuance; only other assets and liabilities of 200, respectively, are recorded for government (as if it raised a loan of 200). Tables 2-4 include these options.

[3] Mix of these options called split-asset approach is also discussed in this paper but they are not generally different from basic options.

Table 3
Emission permits as non-produced non-financial assets

	Uses						Resources					
	Govern-ment	Non-go-vernment	Resident economy	Rest of the world	Goods & services	Total	Govern-ment	Non-go-vernment	Resident economy	Rest of the world	Goods & services	Total
	Production account											
Exports of goods & services												
Imports of goods & services												
Output												
	Generation of income account											
Compensation of employees												
Taxes on production												
	Allocation of primary income account											
Reinvested earnings on FDI												
	Changes in assets						**Changes in liabilities**					
	Govern-ment	Non-go-vernment	Resident economy	Rest of the world	Goods & services	Total	Govern-ment	Non-go-vernment	Resident economy	Rest of the world	Goods & services	Total
	Capital account											
Fixed capital formation												
Changes in inventories												
Non-produced assets	-200	200	0			0						
	Financial account											
Equity												
Other accounts	200	-200	0			0						
	Other changes in volume											
Fixed capital formation												
Changes in inventories												
Non-produced assets	200		200			200						
Equity												
Other accounts												

Table 4
Emission permits as financial assets

	Uses						Resources					
	Govern-ment	Non-go-vernment	Resident economy	Rest of the world	Goods & services	Total	Govern-ment	Non-go-vernment	Resident economy	Rest of the world	Goods & services	Total
	Production account											
Exports of goods & services												
Imports of goods & services												
Output												
	Generation of income account											
Compensation of employees												
Taxes on production												
	Allocation of primary income account											
Reinvested earnings on FDI												
	Changes in assets						**Changes in liabilities**					
	Govern-ment	Non-go-vernment	Resident economy	Rest of the world	Goods & services	Total	Govern-ment	Non-go-vernment	Resident economy	Rest of the world	Goods & services	Total
	Capital account											
Fixed capital formation												
Changes in inventories												
Non-produced assets												
	Financial account											
Equity												
Other accounts	200		200			200	200		200			200
	Other changes in volume											
Fixed capital formation												
Changes in inventories												
Non-produced assets												
Equity												
Other accounts												

9. The debate is going on but it, however, seems that the option of financial assets is not so compatible with emission permits as tradable assets since these permits may be tradable just after their issuance while recording of financial assets ends only at the time of their surrender. This lack of compatibility will be more evident in our later discussion.

10. It is, however, possible that firms hold non-financial assets (similarly to financial assets) only for sale. Moreover, main activity of a firm may be producing intangible assets for sale or merchanting of intangible assets. In this case purchase and sell of these assets should not be recorded under fix capital formation since fixed assets are used in production for more than a year (see 2008 SNA, paragraph 10.11).

11. Consider now the firm engaged in the production with produced intangible asset, and let this firm export these assets instead of using them[4]. Suppose that the firm has exports of 1100 so the output of 100 is the same as in the previous case, and so are the compensation of employees (of 30) and reinvested earnings (of 70). The difference is that there is no direct investment of 1000 in the lack of fixed capital formation. As a result, im-ports of intangible assets of 1000 are recorded in production account as goods and services[5]. Table 5 shows this case.

Table 5

Produced intangible assets as held for resale

	Uses						Resources					
	Govern-ment	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*	*Govern-ment*	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*
	Production account											
Exports of goods & services				1100		1100					1100	1100
Imports of goods & services					1000	1000				1000		1000
Output					100	100		100	100			100
	Generation of income account											
Compensation of employees		30	30			70						
Taxes on production												
	Allocation of primary income account											
Reinvested earnings on FDI										70		70
	Changes in assets						Changes in liabilities					
	Govern-ment	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*	*Govern-ment*	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*
	Capital account											
Fixed capital formation												
Changes in inventories												
Non-produced assets												
	Financial account											
Equity				70		70						
Other accounts										100		100
	Other changes in volume											
Fixed capital formation												
Changes in inventories												
Non-produced assets												
Equity												
Other accounts												

[4] It would be possible to divide selling of these assets between exports and reselling of them to other resident units or divide purchase of this assets between resident and non-resident sellers and own-account production. This would just complicate the discussion while focusing only on exports makes our point more explicit.

[5] It may be a question why inventories are not recorded since theoretically assets for sale should be recorded inventories before selling. It is true but practically these intangible assets are resold immediately after their purchase so their values at the time of acquisition and disposal practically are the same, and changes in inventories should be recorded on net basis. The difference between prices of exports and imports should rather be considered as production since firms engaged in merchanting help connecting buyers and sellers.

12. The case of non-produced intangible assets is similar if they are held also for sale. The difference is that, for non-produced non-financial assets should not be recorded under goods and services, only net export of them of 100 are recorded in production account. Table 6 shows this recording.

Table 6
Non-produced intangible assets as held for resale

	Uses						Resources					
	Govern-ment	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*	*Govern-ment*	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*
	Production account											
Exports of goods & services				100		100					100	100
Imports of goods & services												
Output					100	100		100	100			100
	Generation of income account											
Compensation of employees		30	30			70						
Taxes on production												
	Allocation of primary income account											
Reinvested earnings on FDI										70		70
	Changes in assets						**Changes in liabilities**					
	Govern-ment	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*	*Govern-ment*	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*
	Capital account											
Fixed capital formation												
Changes in inventories												
Non-produced assets												
	Financial account											
Equity				70		70						
Other accounts										100		100
	Other changes in volume											
Fixed capital formation												
Changes in inventories												
Non-produced assets												
Equity												
Other accounts												

13. Some questions arise here. First, there are purchases and *sales* of assets here, and receipts from sales of assets are generally considered as extraordinary income in the current operating performance concept both upon recent and new methodological standards (COPC, see Balance of Payments Manual 6th edition (BPM6) paragraph 11.27, cf. GN D.17, paragraph 11, Annex II and IV). It should be important to specify that only sales of fixed assets are relevant here[6].

14. Second, in the case of produced intangible assets costs (i.e., buying and/or producing) of fixed assets also should be out of scope of operating incomes (as investments). If, however, these assets are not fixed assets since they are held (or produced) for sale, costs of acquiring these assets also should be recorded in production account[7]. This should be also discussed more explicitly in new manuals.

15. Third, transactions on emission permits (and generally on non-produced non-financial assets) are basically not recorded in production account. In the case of merchanting of them, however, the merchant performs similar activity to one dealing with goods, services, or securities. In these cases, margins attributed to merchants are recorded as goods and services

[6] International Financial Reporting Standards (IFRS) can help here since IFRS5 Non-current Assets Held for Sale and Discontinued Operations recognise the difference between fixed assets and assets held for sale.

[7] This point is important if it should be decided whether e.g., R&D costs are included in calculation of operating income or not. If R&D is produced for sale (and possibly financed by another firm), its costs should not be excluded from this calculation.

in production account so this recording can be also justified in the case of merchanting of intangible assets.

16. Finally, as it was already mentioned, if emission permits were recorded as financial assets at the time of their issuance, their resale as tradable assets would lead to contradiction. Moreover, if first they were recorded as taxes on production, it would be also not easy to explain their cross-border transactions and their consequences, i.e., that the production will be carried out in other economy than the one where taxes on it are paid and, because of the time (and therefore price) differences between dates of issuance and surrender of these permits, asymmetries may arise between bilateral flows. It can, of course, also be argued that the recording of emission permits as non-produced non-financial assets is also not a sufficient solution since upon recent SNA atmosphere is not an economic asset for which licences can be established (see 2008 SNA, paragraph 17.363). It is true since now nobody can really own the atmosphere – but atmosphere also may be an implicit asset for which a permit to use it can be established (see WS.7, paragraphs 23-33).

17. In sum, the option of non-produced non-financial asset (Table 3) seems to be the relatively most sufficient solution for recording of emission permits so their transactions usually would be recorded on capital account. As it, however, was discussed, if these permits are bought and held for sale, the net of these transactions would be recorded rather in production account, and if partners are non-residents, under exports of goods and services.

III. Challenges for intangible assets owned by SPEs

18. The issue of ownership of non-financial assets by SPEs is not discussed explicitly in recent manuals. This issue is first included in UNECE handbook (see UNECE 2015, paragraphs 4.35-36) where SPEs as legal owners of non-financial assets are also proposed to be economic owners of them, and this proposal seems to be included in new manuals, too. The final report of IMF Task Force on SPEs also adopted this point of view indirectly when limited the criterion of the lack of production by SPEs in the resident economy included in BD4 (Benchmark Definition of Foreign Direct Investment - see Box 6.2 there) to the lack of *physical* production (see IMF 2018, paragraph 35). It means that statistically SPEs owning non-financial intangible assets can take a part in resident production[8].

19. In many cases the purchase of these assets is financed by direct investments of non-resident owners of these SPEs. In Balance of Payments context, it means that behind FDI flows intangible assets may be found. In the case of SPEs it is also proposed that for analytical purposes FDI data attributed to SPEs should be excluded from total figures[9]. As a result, in current account (and in SNA context, in production account) some production activities of resident SPEs can be recorded through cross-border services flows, but in the same time assets used for these production activities can be excluded from financial account flows and stocks.

20. Consider now our previous firm engaged in production with the help of produced intangible assets, shown in Table 1, but differently from that case, the firm is SPE and it has no resident partners and employees. Table 7 shows this case.

21. In this case the whole output of 100 is exported and reinvested earnings will be also 100[10]. Since an SPE is considered as the economic owner of intangible assets, its output should be recorded in production account. Following the proposal that financial flows and stocks of SPEs should be distinguished from the ones of non-SPEs and, at least for analytical purposes, should be excluded from total figures, these exclusions marked by grey (including property incomes and the relevant capital account items for the purpose of consistency between national accounts and balance of payments) will result in production without any

[8] The criteria of the lack of physical production also explicitly means that non-financial assets owned by SPEs should be only intangible assets (see also IMF 2018, paragraph 35).

[9] It is well-known that SPEs, especially pure financial SPEs may inflate financial flows and stocks which can rather distort the real picture of the resident economy.

[10] There are surely some operational costs and resident taxes but for simplicity they can be also left out of scope here.

assets and incomes. It seems to be contradictory like the of resident production without resident employees.

Table 7

Produced intangible assets as fixed assets and owned by resident SPE

	Uses						Resources					
	Govern-ment	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*	*Govern-ment*	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*
	Production account											
Exports of goods & services				100		100					100	100
Imports of goods & services												
Output					100	100		100	100			100
	Generation of income account											
Compensation of employees												
Taxes on production												
	Allocation of primary income account											
Reinvested earnings on FDI										100		100
	Changes in assets						**Changes in liabilities**					
	Govern-ment	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*	*Govern-ment*	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*
	Capital account											
Fixed capital formation		1000	1000			1000				1000	1000	1000
Changes in inventories												
Non-produced assets												
	Financial account											
Equity				1100		1100						
Other accounts										100		100
	Other changes in volume											
Fixed capital formation												
Changes in inventories												
Non-produced assets												
Equity												
Other accounts												

22. It is similar if we consider a resident SPE as a merchant of intangible asset. The difference again that in this case there is no investment (as in Tables 5 and 6) but if we also do not take financial account and property incomes transactions in account for analytical purposes, it also seems that there is a resident production without any income. Table 8 shows this case[11].

[11] For simplicity only the case of non-produced non-financial intangible assets is shown here. Really, we can merge the discussion of produced and non-produced intangible asset since their main points are the same (it can be done, anyway, already for figures 5 and 6 but first it seems to be transparent to show them separately).

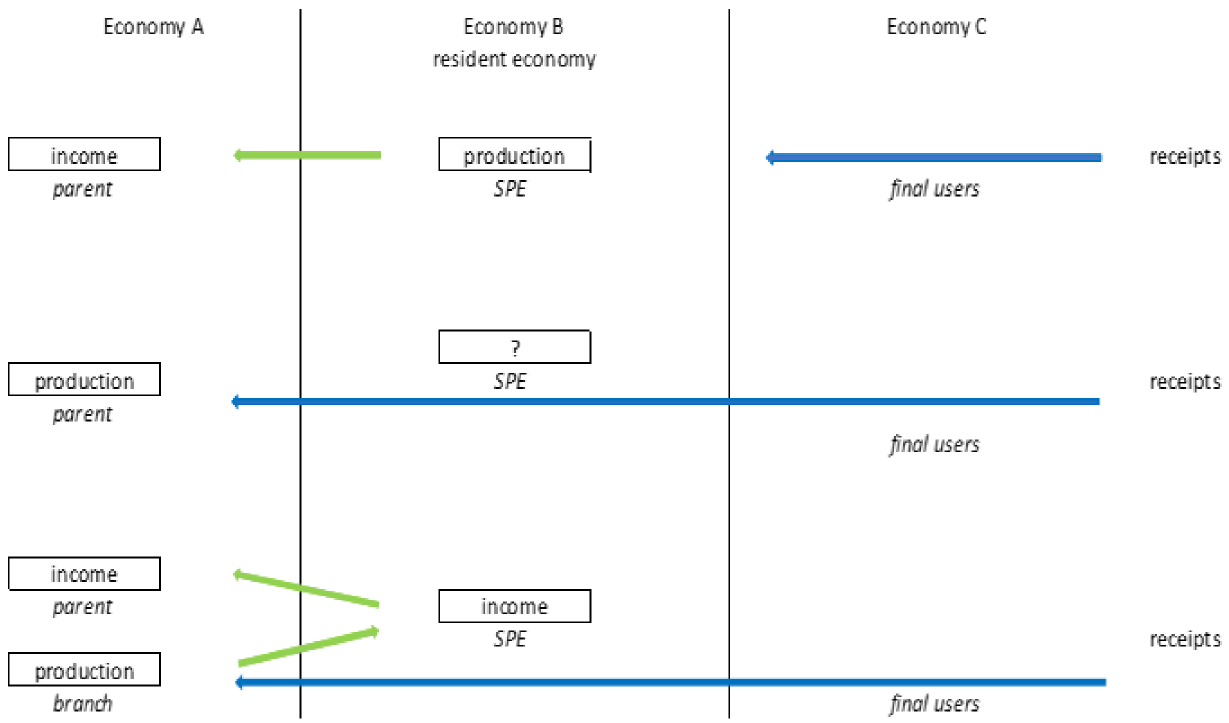
Table 8
Intangible assets held for sale through resident SPE

	Uses						Resources					
	Govern-ment	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*	*Govern-ment*	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*
	Production account											
Exports of goods & services				100		100					100	100
Imports of goods & services												
Output					100	100		100	100			100
	Generation of income account											
Compensation of employees												
Taxes on production												
	Allocation of primary income account											
Reinvested earnings on FDI										100		100
	Changes in assets						**Changes in liabilities**					
	Govern-ment	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*	*Govern-ment*	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*
	Capital account											
Fixed capital formation												
Changes in inventories												
Non-produced assets												
	Financial account											
Equity				100		100						
Other accounts										100		100
	Other changes in volume											
Fixed capital formation												
Changes in inventories												
Non-produced assets												
Equity												
Other accounts												

23. Although the exclusion of financial account and property income items do not distort figures here so much as in the case of fixed assets (because of the lack of investment) but theoretically this case also shows the former contradiction. It seems that this contradiction can be solved by rerouting these intangible assets to *non-resident owners* of SPEs but in this case all related transactions should be excluded from national accounts and balance of payments which really would be complicated since SPEs may have other transactions beyond using or reselling intangible assets.

24. Another possibility is to reroute these transactions to *economies of non-resident owners* through notional branches in those economies. These branches can be justified since the production really should be attributed to those countries (see BPM6, paragraphs 4.26-4.27). Figure 1 shows these options.

Figure 1
Rerouting production of resident SPEs



25. It can be seen, that if the production is directly rerouted from resident SPEs to their non-resident owners, the resident SPE may get into a "vacuum", i.e., into a status without any operation which is a bit contradictory. The last option including a branch of the resident SPE in the country of its owner would avoid this consequence and has the advantage that none of transactions should be excluded. In addition, it shows clearly pass-through characteristics of SPEs with non-financial assets, too.

26. The reroute means that profits of these SPEs come from investments instead of production, as it can also be seen in Table 9.

Table 9
Intangible assets rerouted to economies to non-resident owners

	Uses						Resources					
	Govern-ment	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*	*Govern-ment*	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*
	Production account											
Exports of goods & services												
Imports of goods & services												
Output												
	Generation of income account											
Compensation of employees												
Taxes on production												
	Allocation of primary income account											
Reinvested earnings on FDI				100		100				100		100
	Changes in assets						**Changes in liabilities**					
	Govern-ment	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*	*Govern-ment*	*Non-go-vernment*	*Resident economy*	*Rest of the world*	*Goods & services*	*Total*
	Capital account											
Fixed capital formation												
Changes in inventories												
Non-produced assets												
	Financial account											
Equity				100		100				100		100
Other accounts												
	Other changes in volume											
Fixed capital formation												
Changes in inventories												
Non-produced assets												
Equity												
Other accounts												

27. This recording also means that there is no connection to the resident economy as it is expected from a true SPE. It is, of course, also a task that at international level there will be possibly no "missing" GDP and investment because of this rerouting. It would help if countries found non-resident SPEs owned by residents since, if necessary, this rerouting also can be done in resident statistics. Table 10 shows these consequences.

Table 10
Comparison of criteria of SPEs

	IMF TF definition	**OECD BD4 criteria with rerouting only resident SPEs**	**OECD BD4 criteria with rerouting SPEs in both direction**
Country GDP data aggregable at global level	*yes*	*partly*	*yes*
Country GDP data aggregable at regional level	*partly*	*partly*	*yes*
Bilateral asymmetry of trade	*no*	*partly*	*no*
Adequate distribution of production across countries	*partly*	*partly*	*yes*
Possibility of excluding economic ownership of non-financial assets	*no*	*yes*	*yes*
Possibility of "missing" or "excess" GDP at global level	*no*	*yes*	*no*
Possibility of "missing" or "excess" GDP at regional level	*yes*	*yes*	*no*

28. In sum, it seems to be worth discussing further this issue. It is possible that without any further step there will be a trade-off between rerouting and missing GDP and investment at international level. It, however, also matters how global GDP is distributed over countries and how these national GDPs are related to national (gross) fixed capital formations, possibly excluding the ones established by foreign direct investments through resident SPEs. The lack of rerouting may distort this picture.

IV. Conclusions

29. Taking stock of recent manuals and proposals, production boundary seems to be too narrow and too wide at the same time in connection with intangible assets. On the one hand, transactions on intangible assets held for sale may be excluded from production account because receipts from sales of assets generally are considered as extraordinary, non-operating income elements. On the other hand, all transactions connected to intangible assets may be included in production account if these assets are owned by resident SPEs since these SPEs are considered as not only legal but also economic owners of these assets.

30. It seems to be contradictory since a transaction on intangible assets held for sale at the same time may be both excluded from production account on the basis that it includes sale of assets and included in production account on the basis that these assets are owned by resident SPEs. In addition, if these assets are emission permits, it is questioned that they are assets at all. In any case, it indicates that something should be modified to avoid this contradiction.

31. Some simple changes would make the picture clearer. On the one hand, discussing operating income, one criterion of exclusion, called sales of assets, should be changed to the one called sales of **fixed** assets. This change would include transactions on intangible assets held for sale in calculating operating income. On the other hand, one criterion of SPEs, called little or no physical production, should be restored to one included in BD4, called little or no production. This change would establish the consistency between production, income, and financial account if financial flows and stocks of resident SPEs were excluded from total figures, at least for analytical purposes. Finally, atmosphere should be considered as **natural resource** similarly to international waters and radio spectra for which permits to use (i.e., tradable assets) can be established and options of taxes or financial assets may be abandoned.

32. Implementation of these modified criteria, of course, is also not a simple task. They, however, can reduce inconsistencies and asymmetries both at national and international level and specify more the production boundary. It would be worth discussing further these issues and making their problems more explicit in new manuals.

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