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Copeland's Money-Flows Accounts and The Presentation Format of National Accounts

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Copeland's Money-Flows Accounts and The Presentation Format of National Accounts

with

System of Real & Financial National Accounts (ReFiNA)

as an appendix

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Abstract

It is a well known fact that many asset bubbles have ended up in severe recessions. Although national accounts is the only statistics to depict the whole situation what is going on in the economy, the traditional production oriented System of National Accounts is not suitable to fully understand the mechanism of creation and burst of the bubble. Copeland (1949) clearly states that his money-flows accounts are dedicated to solve such problems. The money-flows accounts satisfy all the desirable criteria of national accounting: (a) the vertical double entry that ensures the internal consistency within an institutional unit; (b) the horizontal double entry that assures the inter-consistency between institutional units; (c) the historical cost accounting that guarantees the consistency between the flow and stock statements, which in turn will ensure the intertemporal consistency between the time periods. One of the main features of Copeland's money-flows accounts is that it has both statements of payments and balances, which are equivalents of income statement and balance sheet in the business accounting. The money-flows accounts were on the historical cost basis to demonstrate the direct links between the two statements. It should be noted that 'capital gain' constitutes a transfer payment, associated with an asset transaction, which is recorded in the historical cost accounting as a part of the acquisition cost of the asset on the payer side and as a resource or a receipt of transfer payment on the recipient side. The authors believe it is high time to revisit Copeland and construct an alternative more money oriented system of national accounts that precisely depicts the repercussions between the real and financial economy. In the appendix of the paper, one of such examples namely System of Real & Financial National Accounts (ReFiNA) will be proposed.

Key Words

National accounting; Capital gain or loss; Production boundary;
Asset bubble; Repercussions between the real and financial economy

JEL Classification Numbers

B23; C82; E01

1. Copeland's Money-flows Accounts

It is well known that it was Morris Copeland who systematically drew the ground design of the money-flows accounts, or flow of funds accounts as we now call them. However, one of Morris Copeland's significant but less well-known roles is his contribution to the development of national accounting, which means the general application of business accounting methods to aggregative economic measurement[1]. Indeed, we find more similarity between money-flows accounts and 1968 and subsequent systems of national accounts (SNA) than what we nowadays refer to as flow of funds accounts. In the basic conception of the money-flows accounts, Copeland (1947, 1949, 1952) conceives of the economy as composed of eleven groups of institutional units or institutional sectors. Units in each of these groups make and receive payments to other units in the same and the other sectors. For each sector, a double-entry account is kept with payments classified by the unit and sector making the payment, and the purpose of the payment; it is sometimes referred to as vertical double entry in the national accounting. The accounts for all groups for a year are fitted together with each payment reported twice. The basic unit of analysis is a transaction between two parties ― payer and recipient; it is commonly referred to as horizontal double entry. Thus all the transactions are reported four times; that makes quadruple entry. Twelve types of transaction are distinguished. Each transaction involves a money outflow for one transactor and an equal inflow for another. Each sector's inflows and outflows are shown for each of the twelve types of transaction. These money-flows together constitute the "main money circuit" that is measured[2].

The problem of Copeland (1947, 1949, 1952) is that his tables lack a bird's eye view of the total system. In this regards the presentation format found in Shishido (1956), which is reproduced as Table 1, is a great improvement. In this table, the U.S. economy is divided into eleven sectors as mentioned above. They are[3]: (1) households; (2) non-financial corporations; (3) non-financial non-farm private enterprises; (4) farms; (5) the federal government; (6) state and local governments; (7) security and realty firms; (8) life insurance companies; (9) other insurance carriers; (10) the banking system; (11) miscellaneous financial enterprises. In addition to the financial statements for these eleven sectors, there is one for the rest of the world, which is a modification of the balance of payments statement. Broadly, it may be said that these eleven financial statements tell who has paid and who has received how much on account of various

[1] Dawson (1991), p.93.
[2] Rutherford (2002), pp.276-277.
[3] The sector names used in Shishido (1956) are based on Copeland (1947) rather than on Copeland (1952).

types of transactions or objects of payment; the part of the statements is referred to as statement of payments. These objects of payment are: gross cash pay; cash interest; cash dividends; gross rents; insurance premiums; insurance benefits; public purpose payments; taxes collected; tax refunds; net owner takeouts; net payments for real estate transfers; and gross sales of goods and services. The financial statements also show who owned and who owed how much on account of currency and deposits, treasury currency, accounts receivable/payable, and the other loans and securities; the part of the statements is referred to as statement of balances. Taken together, the statements for the various transactor groups constitute a set of measurements that enable us to trace flow of funds through the economy. There are two indispensable features in the money-flows accounts of Copeland (1947, 1949, 1952) rearranged by Shishido (1956). In the first place, the sources and dispositions of funds are balanced as the bottom-most line reveals. In the second place, the resources and the uses of each object of payment are balanced in total as demonstrated in the last two columns. The former assures that the requirements of the vertical double-entry are met while the latter ensures that those of the horizontal double-entry are fulfilled; thus it is proved that the quadruple entry is actually working in the money-flows accounts.

Before going any further, let us take a close look at the structure of the each statement. The fundamental equation is found at the bottom of the statement under heading of "sources and disposition of money":

$$U_{24,t} + U_{25,t} + U_{26,t} = R_{24,t} + R_{25,t} + R_{26,t} \ ; \qquad (1)$$

or

$$U_{13,t} + U_{21,t} + U_{22,t} + U_{26,t} = R_{13,t} + R_{21,t} + R_{22,t} + R_{26,t} \ ; \qquad (2)$$

where $U_{i,t}$ and $R_{i,t}$ are uses and resources in item i at period t respectively; the item code is found in the first column of Table 1. The above equations mean that for any institutional unit for any period, total resources equal total uses. Equation (2) is further expanded as follows:

$$\sum_{i=1}^{12} U_{i,t} + \left(U_{20,t} - U_{20,t-1}\right) + U_{22,t} + U_{26,t} = \sum_{i=1}^{12} R_{i,t} + \left(R_{20,t} - R_{20,t-1}\right) + R_{22,t} + R_{26,t} \tag{3}$$

Both sides of equation (3) are sums of ordinary payments/receipts inclusive of items 1 through 12, increment of financial assets/liabilities through primary market transactions, gains/losses accrued through secondary market asset transactions or redemptions (inclusive of debt forgiveness), and statistical discrepancies.

Unlike the system of national accounts widely used today, there are no distinctions between production and other sources of income like interest payment or insurance benefits. Copeland clearly states that "gross sales of goods and services" include secondhand goods as well[4]. In Copeland's words, the attempt is to develop a set of measurements which should include all the flow of funds which play a substantive part in effecting over-all economic adjustments, a set of measurements which should be sufficiently comprehensive to include, so far as money flows are concerned, all the statistical series necessary to supply an empirical basis for an aggregative approach to general equilibrium theory. The aim is a full-fledged system of national accounting for money-payment transactions[5]. Indeed, despite all the differences, there is a conspicuous similarity between the presentation formats of the money-flows accounts of Copeland (1947, 1949, 1952) and 1968 and subsequent versions of the SNA.

It must be noted that Copeland (1947) discussed in detail the way money-flows should be recorded. He asserts that the statements should exclude transactions that a person enters into with himself, transactions that involve no money payment. Depreciation write-offs and unrealized holding gains may serve to illustrate the type of non-money payment transaction that should be excluded. This means that the financial statements used to measure money-flows should not be on an accrual basis; they should be on a cash basis[6]. The statements must be on the historical cost basis rather than on the current cost basis[7]. Another distinctive feature of Copeland (1947, 1949, 1952) is that it excludes non-financial assets altogether from the statement of balances. All the assets and liabilities recorded in the statement of balances are of the financial nature, thus they relate each other in lender-borrower relations. The non-financial assets such as real estate are recorded only in the statement of payments when they are traded.

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[4] Copeland (1952), p.106.
[5] Quoted from Copeland (1947), p.32.
[6] *Ibid*., p.32.
[7] Current cost accounting was not widely used at that time.

2. Historical Cost National Accounting

One of the main features of Copeland's money-flows accounts is that it has both statements of payments and balances, which are equivalents of income statement and balance sheet in the business accounting. The money-flows accounts were on the historical cost basis to demonstrate the direct links between the two statements. The U.N. system of national accounts introduced national balance sheet for the first time in its 1968 version; it was on the current cost basis[8]. In the era when Copeland proposed his money-flows accounts, current cost accounting was not widely used, but so was in the 1960s or even in the 1970s. Richard Stone opted for the current cost over the historical cost most probably because he was aware of the importance of capital stock as a production factor so that it should be valued at the replacement cost rather than at the acquisition cost. Since 1968 and the subsequent SNA put more emphasis on production rather than on income, it was a natural choice. In the case of business accounting, the evolution process from the historical cost accounting to the current cost accounting took more than decades so that the advantages and disadvantages of both systems were thoroughly discussed. However, in the case of national accounting, the discussions of this sort rarely took place. It is a shame because historical cost accounting gives unique perspective into national accounting as Copeland suggests.

2.1 Vertical Double Entry

Let $N_{jt} \geq 0$ be non-financial assets, $F_{jt} \geq 0$ be financial assets and $L_{jt} \geq 0$ be financial liabilities; j and t stands for institutional units and period of time respectively. Since N_{jt}, F_{jt} and L_{jt} are stock variables, t refers to the end of the period. All the variables are recorded in the historical cost or the original acquisition value. We define net worth as follows:

$$W_{jt} \equiv N_{jt} + F_{jt} - L_{jt} \quad . \tag{4}$$

If we denote the values on the opening balance sheet with $t-1$ and those on the closing balance sheet with t, we have the following relations:

[8] SNA 1968, pars.1.64-1.65.

$$\begin{aligned}\Delta W_{jt} &\equiv W_{jt} - W_{jt-1} \\ &= \left(N_{jt} + F_{jt} - L_{jt}\right) - \left(N_{jt-1} + F_{jt-1} - L_{jt-1}\right) \\ &= \Delta N_{jt} + \Delta F_{jt} - \Delta L_{jt} \ , \end{aligned} \tag{5}$$

where

$$\Delta N_{jt} \equiv N_{jt} - N_{jt-1} \ , \tag{6}$$

$$\Delta F_{jt} \equiv F_{jt} - F_{jt-1} \ , \tag{7}$$

$$\Delta L_{jt} \equiv L_{jt} - L_{jt-1} \ . \tag{8}$$

Now let us define $R_{jt} \geq 0$ as resource, which is a factor that increases W_{jt}, and $U_{jt} \geq 0$ as use, which is a factor that decreases W_{jt}. We denote the difference between R_{jt} and U_{jt} as saving:

$$S_{jt} \equiv R_{jt} - U_{jt} . \tag{9}$$

By definitions above, the statement of payments records factors affecting the values recorded in the balance sheet. Thus, in the historical cost accounting, the statements of payments and balances are two sides of the coin.

We can further expand equation (9) as follows:

$$\begin{aligned} S_{jt} &\equiv R_{jt} - U_{jt} \\ &= W_{jt} - W_{jt-1} \end{aligned}$$

$$= \Delta W_{jt}$$

$$= \Delta N_{jt} + \Delta F_{jt} - \Delta L_{jt} \quad . \tag{10}$$

The meaning of the equation is that the saving is understood not only as the difference between resource and use but also as the increment in the net worth during the period. This is another feature of the historical cost accounting, which distinguish it from the current cost accounting. We also have the following relation using equation (10):

$$S_{jt} - \Delta N_{jt} = \Delta F_{jt} - \Delta L_{jt} \quad . \tag{11}$$

Since ΔN_{jt} is also known as gross capital formation or capital investment in short, let us denote it as $I_{jt} \equiv \Delta N_{jt}$:

$$S_{jt} - I_{jt} = \Delta F_{jt} - \Delta L_{jt} \quad . \tag{12}$$

This is the well known relation in the national accounting; the balance of saving and investment equals the financial surplus or deficit. The balancing item is referred to as net lending (if positive) or net borrowing (if negative) in SNA 2008. Net lending means saving surpasses investment while net borrowing implies investment exceeds saving. By summing up equations (10) and (12) over τ, we have the following relations:

$$W_{jt} = \sum_{\tau=1}^{t} S_{j\tau} = \sum_{\tau=1}^{t} \left(R_{j\tau} - U_{j\tau} \right) \quad ; \tag{13}$$

$$W_{jt}^{F} = F_{jt} - L_{jt} = \sum_{\tau=1}^{t} \left(S_{j\tau} - I_{j\tau} \right) \quad . \tag{14}$$

Thus in the historical cost accounting, the net worth (W_{jt}) is the cumulative saving over time while the financial net worth (W_{jt}^{F}) is considered to reflect the balance of saving and investment of the past.

2.2 Production and Capital Gain

In this sub-section, we will take a close look into the relations between statements of balances and payments to find out the meanings of production, capital gain and income gain from the historical cost perspective.

[Example 1]
A merchant sold an automobile, which he bought at \$15000 from a producer, to a customer at \$20000 for cash.

Opening Balance Sheets

	Merchant		Customer	
	Assets	Liabilities	Assets	Liabilities
Automobile	15000			
Cash			20000	
Total	15000		20000	

Closing Balance Sheets

	Merchant		Customer	
	Assets	Liabilities	Assets	Liabilities
Automobile			20000	
Cash	20000			
	20000		20000	

Now let us compare the opening and closing balance sheets. It should be noted that the book value of the automobile has changed during the accounting period because the acquisition costs are different for the merchant and the customer. As a consequence, the net worth of the merchant has increased from \$15000 to \$20000 while that of the

customer has unaltered. In this case, we will record the difference between the selling and acquisition prices in the statement of payments of the merchant in the following manner.

Statements of payments

	Merchant		Customer	
	Uses	Resources	Uses	Resources
Operating margin		5000		

[Example 2]
A producer sold an automobile, which he assembled from a body and a chassis, to a merchant at $15000 for cash. The acquisition costs of the body and the chassis were $4000 and $6000 respectively.

Opening Balance Sheets

	Producer		Merchant	
	Assets	Liabilities	Assets	Liabilities
Body	4000			
Chassis	6000			
Automobile				
Cash			15000	
Total	10000		15000	

Closing Balance Sheets

	Producer		Merchant	
	Assets	Liabilities	Assets	Liabilities
Body				
Chassis				
Automobile			15000	
Cash	15000			
Total	15000		15000	

In the opening balance sheet of the producer, the automobile is recorded as the assembling parts: the body and the chassis. Alternatively, the producer may record it as an automobile at the acquisition cost of the assembling parts: $4000+$6000=$10000. In either case, the net worth of the producer has increased from $10000 to $15000 while that of the merchant has unaltered. In this case, we will record the difference between the selling price and the acquisition cost of the automobile in the statement of payments of the producer as follows.

Statements of payments

	Producer		Merchant	
	Uses	Resources	Uses	Resources
Operating margin		5000		

[Example 3]
A broker sold a sovereign bond, which he bought at $10000 in the market, to a customer at the same price.

Opening Balance Sheets

	Broker		Customer	
	Assets	Liabilities	Assets	Liabilities
Sovereign bond	10000			
Cash			10000	
Total	10000		10000	

Closing Balance Sheets

	Broker		Customer	
	Assets	Liabilities	Assets	Liabilities
Sovereign bond			10000	
Cash	10000			
	10000		10000	

This is the case that the bond and the cash are exchanged at par. Neither of the net worth of the producer nor the customer has changed during the accounting period. In such case, the recording is completed in the balance sheets and no entry is necessary in the statements of payments.

[Example 4]
A broker sold a sovereign bond, which he bought at $9000 in the market, to a customer at $10000 for cash.

Opening Balance Sheets

	Broker		Customer	
	Assets	Liabilities	Assets	Liabilities
Sovereign bond	9000			
Cash			10000	
Total	9000		10000	

Closing Balance Sheets

	Broker		Customer	
	Assets	Liabilities	Assets	Liabilities
Sovereign bond			10000	
Cash	10000			
	10000		10000	

The book value of the sovereign bond has changed during the accounting period because the acquisition costs are different for the broker and the customer. As a consequence, the net worth of the broker has increased from $9000 to $10000 while that of the customer has unaltered. In this case, we will record the difference between the selling and acquisition prices in the statement of payments of the broker in the following manner.

Statements of payments

	Broker		Customer	
	Uses	Resources	Uses	Resources
Operating margin		1000		

[Example 5]
A customer paid $500 interest on the $10000 mortgage to a banker.

Opening Balance Sheets

	Banker		Customer	
	Assets	Liabilities	Assets	Liabilities
Mortgage	10000			10000
Cash			500	
Total	10000		500	10000

Closing Balance Sheets

	Banker		Customer	
	Assets	Liabilities	Assets	Liabilities
Mortgage	10000			10000
Cash	500			
Total	10500			10000

There is no transaction or redemption of mortgage during the accounting period. However, there are changes in the net worth of both the customer and the banker as a result of $500 interest payment from the customer to the banker. The interest payment is recorded as a use for the customer, while that is registered as a resource for the banker, in their statements of payments.

Statements of payments

	Banker		Customer	
	Uses	Resources	Uses	Resources
Interest		500	500	

The payments of rent, which associate with leases on non-financial assets, will be recorded in the same manner.

[Example 6]
A farmer sold a cabbage, which he had just harvested, to a customer for consumption at $1.00. This is a tricky situation indeed so we should follow the actions step by step. In the first place let us record the event of harvesting of cabbage. Let us call it Day 1, just for convenience.

Opening Balance Sheets of Day 1

	Farmer		Customer	
	Assets	Liabilities	Assets	Liabilities
Cabbage				
Cash			1.00	
Total			1.00	

Closing Balance Sheets of Day 1

	Farmer		Customer	
	Assets	Liabilities	Assets	Liabilities
Cabbage	0			
Cash			1.00	
Total	0		1.00	

There is no change between the opening and closing balance sheets of the farmer because the acquisition cost of the cabbage is assumed to be nil. The value of the cabbage is recorded in the closing balance sheet as “0” just for a reminder. Now, let us

move to the next event: the sale of the cabbage. We will call it Day 2, again just for convenience.

Opening Balance Sheets of Day 2

	Farmer		Customer	
	Assets	Liabilities	Assets	Liabilities
Cabbage	0			
Cash			1.00	
Total	0		1.00	

Closing Balance Sheets of Day 2

	Farmer		Customer	
	Assets	Liabilities	Assets	Liabilities
Cabbage			1.00	
Cash	1.00			
Total	1.00		1.00	

The opening balance sheet of Day 2 is no other than the closing balance sheet of Day 1. The cabbage is sold and the acquisition cost for the customer is $1.00. There is no alteration in the net worth of the customer. However, since the acquisition cost of the cabbage for the farmer was nil, his net worth increased by $1.00 as the result of the transaction. Thus his revenue will be recorded in his statement of payments as follows.

Statements of payments of Day 2

	Farmer		Customer	
	Uses	Resources	Uses	Resources
Operating margin		1.00		

On Day 3, the cabbage is served for the customer's supper.

Opening Balance Sheets of Day 3

	Farmer		Customer	
	Assets	Liabilities	Assets	Liabilities
Cabbage			1.00	
Cash	1.00			
Total	1.00		1.00	

Closing Balance Sheets of Day 3

	Farmer		Customer	
	Assets	Liabilities	Assets	Liabilities
Cabbage				
Cash	1.00			
Total	1.00			

Since the cabbage has disappeared from the customer's balance sheet, his net worth has decreased by the same amount during the day. Thus the consumption will be recorded as a use in his statement of payments.

Statements of payments of Day 3

	Farmer		Customer	
	Uses	Resources	Uses	Resources
Consumption			1.00	

If we assume all the above events take place within an accounting period, all but only two balance sheets shall be eliminated. The remaining two are the opening balance sheet of Day 1 and the closing balance sheet of Day 3, which are as follows.

Opening Balance Sheets

	Farmer		Customer	
	Assets	Liabilities	Assets	Liabilities
Cabbage				
Cash			1.00	
Total			1.00	

Closing Balance Sheets

	Farmer		Customer	
	Assets	Liabilities	Assets	Liabilities
Cabbage				
Cash	1.00			
Total	1.00			

When we compare the opening and closing balance sheets, we find the net worth of the farmer has increased and that of the customer has decreased during the accounting period. As the consequence, the changes will be recorded in the statements of payments of the both parties in the following manner.

Statements of payments

	Farmer		Customer	
	Uses	Resources	Uses	Resources
Operating margin		1.00		
Consumption			1.00	

The abridged accounting formula of Example 6 applies not only to some of the consumer goods but also to most of the consumer services.

According to the production boundary stipulated in SNA 2008[9], Examples 1, 2 and 6 falls into the category while Examples 3 and 4 does not. Example 5 is the boundary case as is discussed as FISIM[10]. When no capital gain accrues as in Example 3, the transactions in the financial instruments are recorded only in the balance sheets, and have nothing to do with the statement of payments. However, when a capital gain is realized as in Example 4, it is recorded as a resource in the statement of payments. There is a conspicuous resemblance in the statements of balances and payments between Examples 1 and 4. It is no wonder because there is obvious similarity in the economic behavior of an automobile dealer and a stock broker; they buy cheap and sell high. Since an automobile dealer does not change the fundamental nature of the product, you may call the operating margin 'capital gain' in place of 'production'. However, as far as the accounting formula is concerned, there is not much difference between Examples 1, 4 and 2 either. Although in the opening balance sheet of Example 2, the automobile is recorded as the assembling parts, the body and the chassis, it is also possible to record it as an automobile at the acquisition cost of the assembling parts. In that case we find not much difference between Examples 1 and 2. As a conclusion it can be said that there are less differences between 'production' and 'capital gain' in the historical cost perspective, than between 'capital gain' and 'income gain' such as interest or rent. Another thing is that, the difference between 'production' and 'capital gain' is smaller than between 'production' and 'income gain', which is much discussed as the boundary case. Anyhow, it should be noted that 'capital gain' constitutes a transfer payment, associated with an asset transaction, which is recorded in the historical cost accounting as a part of the acquisition cost of the asset on the payer side and as a resource or a receipt of transfer payment on the recipient side.

2.3 Horizontal Double Entry

In the previous sub-sections, we have examined the intra-unit balances or vertical double entry as often referred to as. Now let us shift our attention to the inter-unit balances or horizontal double entry, a unique feature of the national accounting. As we have discussed, the historical cost accounting is based on the changes in assets and liabilities. We will divide the asset transactions into two classes: the primary market transactions and the secondary market transactions. The former refers to the creation of new assets; however in case of the financial assets, it also includes the incurrence and

[9] Paragraphs 1.40-1.44.

[10] Financial intermediation services indirectly measured. SNA 2008, paragraphs 6.163-6.169. For earlier discussions on this topic, see SNA 1968, paragraphs 6.32-6.35.

the redemption of the corresponding liabilities. The latter refers to the transactions of existing assets; all the transactions of the real estate also belong to this class.

The acquisition of non-financial assets consists of two portions:

$$\Delta N_{jt} = \Delta N_{jt}^{P} + \Delta N_{jt}^{S} \quad . \tag{15}$$

The superscripts P and S refer to the primary and secondary market transactions respectively. ΔN_{jt}^{P} means the acquisition of durable goods, which are not used before, while ΔN_{jt}^{S} refers to purchase (if positive) or sale (if negative) of existing assets such as land or secondhand machinery. Similarly, the acquisition of financial assets comprises of two parts:

$$\Delta F_{jt} = \Delta F_{jt}^{P} + \Delta F_{jt}^{S} \quad . \tag{16}$$

ΔF_{jt}^{P}, if positive, denotes acquisition of newly-created financial assets, by means of lending money or purchasing a newly issued bond etc.; if negative, it means redemption such as repayment of loans or any kind of financial instruments. ΔF_{jt}^{S} refers to purchase (if positive) or sale (if negative) of previously issued securities or other financial instruments such as stock, bonds etc. either at stock exchange or over the counter. Although there are few transactions of liabilities in the secondary market, we assume there is none:

$$\Delta L_{jt} = \Delta L_{jt}^{P} \quad . \tag{17}$$

ΔL_{jt}^{P}, if positive, denotes an incurrence of liability, such as borrowing money or issuing new financial instruments; if negative, it means redemption such as repayment of loans or other financial instruments.

In the primary market transactions of the financial assets, the lender-borrower

relation holds:

$$\Delta F_{jt}^{P} = \Delta L_{lt}^{P} . \qquad \left(j \neq l \right) \tag{18}$$

By summing up equations (15), (16) and (17) over j, we have the following relations:

$$\sum_{j=1}^{m} \Delta N_{jt} = \sum_{j=1}^{m} \Delta N_{jt}^{P} + \sum_{j=1}^{m} \Delta N_{jt}^{S} \quad ; \tag{19}$$

$$\sum_{j=1}^{m} \Delta F_{jt} = \sum_{j=1}^{m} \Delta F_{jt}^{P} + \sum_{j=1}^{m} \Delta F_{jt}^{S} \quad ; \tag{20}$$

$$\sum_{j=1}^{m} \Delta L_{jt} = \sum_{j=1}^{m} \Delta L_{jt}^{P} \quad , \tag{21}$$

where m is the number of institutional units. Furthermore it is evident that equation (18) produces the following relation:

$$\sum_{j=1}^{m} \Delta F_{jt}^{P} = \sum_{j=1}^{m} \Delta L_{jt}^{P} \quad . \tag{22}$$

In the above equations, $\sum_{j=1}^{m} \Delta N_{jt}^{P}$ is the acquisition value of the produced non-financial assets, which are not used before; it is referred to as the gross fixed capital formation. $\sum_{j=1}^{m} \Delta N_{jt}^{S}$ is an increase (or decrease if negative) in the acquisition value of the non-financial assets changed hands during the accounting period. $\sum_{j=1}^{m} \Delta F_{jt}^{S}$ is an increase (or decrease if negative) in the acquisition value of the financial assets traded in

the secondary markets. In other words, $\sum_{j=1}^{m}\Delta N_{jt}^{S}$ and $\sum_{j=1}^{m}\Delta F_{jt}^{S}$ are the valuation changes, namely the differences in the acquisition value of the current and previous owners of the asset. $\sum_{j=1}^{m}\Delta F_{jt}^{P}=\sum_{j=1}^{m}\Delta L_{jt}^{P}$ is the amount of money paid or earned to get into or get out of lender-borrower relations of any sorts; the status of the lender is referred to as financial assets while that of the borrower is referred to as financial liabilities.

By summing up equation (11) over j, we have the following relations:

$$\sum_{j=1}^{m}S_{jt}-\sum_{j=1}^{m}\Delta N_{jt}=\sum_{j=1}^{m}\Delta F_{jt}-\sum_{j=1}^{m}\Delta L_{jt}\quad . \tag{23}$$

Substitution of equations (19) through (21) into (23) yields

$$\sum_{j=1}^{m}S_{jt}-\sum_{j=1}^{m}\Delta N_{jt}^{P}-\sum_{j=1}^{m}\Delta N_{jt}^{S}=\sum_{j=1}^{m}\Delta F_{jt}^{P}+\sum_{j=1}^{m}\Delta F_{jt}^{S}-\sum_{j=1}^{m}\Delta L_{jt}^{P}\quad . \tag{24}$$

Further substitution of (22) into the above equations yields

$$\sum_{j=1}^{m}S_{jt}-\sum_{j=1}^{m}\Delta N_{jt}^{P}=\sum_{j=1}^{m}\Delta N_{jt}^{S}+\sum_{j=1}^{m}\Delta F_{jt}^{S}\quad . \tag{25}$$

By denoting $S\equiv\sum_{j=1}^{m}S_{jt}$ and $I\equiv\sum_{j=1}^{m}\Delta N_{jt}^{P}$ we have

$$S-I=\sum_{j=1}^{m}\Delta N_{jt}^{S}+\sum_{j=1}^{m}\Delta F_{jt}^{S}\quad . \tag{26}$$

Thus, in the historical cost accounting, the well known macroeconomic relation

$$S = I \tag{27}$$

holds only in case either there is no secondary market transactions or else the right hand side of equation (26) is zero by mere chance. Equation (27) tells that the saving equals investment in the total economy. To satisfy this condition, there must be both excess savers and excess investors. In a closed economy, if the households and the private enterprises in total have excess savings, the government has no choice but absorb the surplus money by issuing sovereign bonds. One option for the government is to spend the money for capital investment. This is a policy to fill the gap between saving and investment by increasing the latter. Another option is to increase the consumption so that the government saving is negative. This is a trick to convert the excess private sector saving into a public consumption.

However there is another way to cope with the saving-investment gap. Equation (26) means that the balance of macroeconomic saving and investment equals the sum of realized capital gains in both non-financial and financial assets. In other words, the existence of the secondary market allows a possible imbalance between macroeconomic saving and investment. This may sound strange. Since produce is either consumed or invested, there is no discrepancy between saving and investment in the first place. The problem arises from the definition of income. In the modern economics, which is based on Keynes (1936) and Kuznets (1937), the income is defined as produce. However, in the above case, the resources include not only income as produce but also the current transfers; it is referred to as income as earnings according to the Lindahl's classification[11]. Since in the SNA, the uses and resources of current transfers offset each other, the definition of income does not have much significance. This is because the SNA is based on the current cost accounting so that it does not explicitly record the current transfers associated with the secondary market asset transactions. In contrast to this, if we stick to the historical cast accounting, we have no choice but to record the differences in the historical cost between the seller and the buyer as current transfer. The transfer is a part of saving for the buyer, while it is an additional portion of the resources for the seller of the asset. Thus the macroeconomic uses do not equal macroeconomic resources any longer.

One of the indispensable features of the historical cost accounting is that the changes in the values of assets and liabilities are fully explained by the figures

[11] See Lindahl (1919).

appearing in the statement of payments. That is all the stock values are no more or no less than the accumulated flow values:

$$N_{jt} = \sum_{\tau=1}^{t} \Delta N_{j\tau} = \sum_{\tau=1}^{t} \left(\Delta N_{j\tau}^{P} + \Delta N_{j\tau}^{S} \right) \ ; \tag{28}$$

$$F_{jt} = \sum_{\tau=1}^{t} \Delta F_{j\tau} = \sum_{\tau=1}^{t} \left(\Delta F_{j\tau}^{P} + \Delta F_{j\tau}^{S} \right) \ ; \tag{29}$$

$$L_{jt} = \sum_{\tau=1}^{t} \Delta L_{j\tau} = \sum_{\tau=1}^{t} \Delta L_{j\tau}^{P} \ . \tag{30}$$

Substitution of equations (28) through (30) into (13) yields

$$\begin{aligned} W_{jt} &= N_{jt} + F_{jt} - L_{jt} \\ &= \sum_{\tau=1}^{t} \left(\Delta N_{j\tau}^{P} + \Delta N_{j\tau}^{S} \right) + \sum_{\tau=1}^{t} \left(\Delta F_{j\tau}^{P} + \Delta F_{j\tau}^{S} \right) - \sum_{\tau=1}^{t} \Delta L_{j\tau}^{P} \\ &= \sum_{\tau=1}^{t} S_{j\tau} \ . \end{aligned} \tag{31}$$

Since $S_{jt} = R_{jt} - U_{jt}$ is either positive or negative, the net worth W_{jt} of an institutional unit can also be either positive or negative. Equation (22) tells $\sum_{j=1}^{m} \Delta F_{jt}^{P} = \sum_{j=1}^{m} \Delta L_{jt}^{P}$ so that we can sum up equation (31) across all the institutional units as follows:

$$\sum_{j=1}^{m} W_{jt} = \sum_{j=1}^{m} \sum_{\tau=1}^{t} S_{j\tau}$$

$$= \sum_{j=1}^{m}\sum_{\tau=1}^{t}\left(\Delta N_{j\tau}^{P} + \Delta N_{j\tau}^{S}\right) + \sum_{j=1}^{m}\sum_{\tau=1}^{t}\left(\Delta F_{j\tau}^{P} + \Delta F_{j\tau}^{S}\right) - \sum_{j=1}^{m}\sum_{\tau=1}^{t}\Delta L_{j\tau}^{P}$$

$$= \sum_{j=1}^{m}\sum_{\tau=1}^{t}\left(\Delta N_{j\tau}^{P} + \Delta N_{j\tau}^{S}\right) + \sum_{j=1}^{m}\sum_{\tau=1}^{t}\Delta F_{j\tau}^{S} \qquad (32)$$

Thus the total net worth of an economy, which is the accumulation of past saving, equals the accumulation of the non-financial assets of the past in the case there is no secondary asset market transactions:

$$\sum_{j=1}^{m} W_{jt} = \sum_{j=1}^{m}\sum_{\tau=1}^{t} S_{j\tau} = \sum_{j=1}^{m}\sum_{\tau=1}^{t}\Delta N_{j\tau}^{P} \quad . \qquad (33)$$

Since the stock of non-financial assets cannot be negative, the total net worth of the economy must be non-negative. But in an open economy, there is a case where only the rest of the world has positive net worth. If it is the case, the total net worth of the domestic economy can be negative. In other words, a country can have net external debt. Another problematic situation is that, when the government spends all the money raised through sovereign bonds for consumption, it has negative net worth so that the total net worth of the economy could be negligible even if the private sectors have significant net worth of their own. In that sense how the government spends the money matters. As long as the government issues sovereign bonds to absorb excess saving, it must be responsible for ensuring that the money is invested in capital goods that bring maximum return. However, in the real world where secondary markets are available, the government has another option, i.e. to do nothing and just wait and see. In that case, an excess saving creates asset inflation as equation (32) suggests. In case it is financial asset inflation, the price of bonds and other securities will rise and will make the ratio of interest payable to the market value of the instrument decrease. As a result, the general interest rate is lowered and the private sector will find more opportunities for profitable capital investment. If it works as it is, wait and see is not a bad idea. However, sometimes even the lowest interest rate fails to attract the investors. Another problem is that, if an asset inflation takes place in the commodity or real estate markets, the capital investment opportunities will become less profitable because of the increase in the relevant cost. Thus the gap will not be closed.

3. Concluding Remarks

This paper revisits the original money-flows accounts proposed by Copeland to see if we can make further improvement of the system of national accounts (SNA), by applying the three fundamental principles adopted in the literature. The money-flows accounts satisfy all the desirable criteria of national accounting: (a) the vertical double entry that ensures the internal consistency within an institutional unit; (b) the horizontal double entry that assures the inter-consistency between institutional units; (c) the historical cost accounting that guarantees the consistency between the flow and stock statements, which in turn will ensure the intertemporal consistency between the time periods. In the case of business accounting, the evolution process from the historical cost accounting to the current cost accounting took more than decades so that the advantages and disadvantages of both systems were thoroughly discussed. However, in the case of national accounting, the discussions of this sort rarely took place. It is pity because historical cost accounting gives unique perspective into national accounting as Copeland suggests.

One of the main features of Copeland's money-flows accounts is that it has both statements of payments and balances, which are equivalents of income statement and balance sheet in the business accounting. The money-flows accounts were on the historical cost basis to demonstrate the direct links between the two statements. One of the insights is that there are less differences between 'production' and 'capital gain' in the historical cost perspective, than between 'capital gain' and 'income gain'. Another thing is that, the difference between 'production' and 'capital gain' is smaller than between 'production' and 'income gain', which is much discussed as the production boundary case. It should be noted that 'capital gain' constitutes a transfer payment, associated with an asset transaction, which is recorded in the historical cost accounting as a part of the acquisition cost of the asset on the payer side and as a resource or a receipt of transfer payment on the recipient side.

It may sound contradictory but one of the advantages of the historical cost accounting is that it explains the evolution of asset prices. In the historical cost accounting the saving investment gap and the asset inflation or deflation are two sides of the same coin. In a closed economy, whenever there is an excess saving, there is an asset inflation unless the government is willing to fill the gap. On the other hand, excess investment causes an asset deflation unless the gap is closed by additional funds from abroad. In case of a financial bubble, the bond yield will be lowered and, at least theoretically the capital investments become relatively more profitable. If it works as it is, it acts as a built-in stabilizer. However, the real problem occurs when an asset bubble

emerges in the commodity or real estate market because the capital investments become less profitable owing to high cost. It explains why non-financial bubble is hard to handle. If you try to cool the bubble by raising interest rate, you will kill the investment as well so that the saving investment gap will not be narrowed. In such case, an asset bubble easily turns into a stagnation or even worse, a stagflation (a combination of stagnation and inflation) that is hard to cure.

Although it is widely accepted that the Great Depression of 1930s originated in the stock market crash of October 29, 1929 (known as Black Tuesday), Galbraith (1954) asserts that it was the burst of real estate bubble that triggered the recession[12]. The oil crisis of the 1970s was a typical case of commodity bubbles, in which not only the prices of the petroleum products but also agricultural and other commodities shot up. The Japanese asset price bubble of the 1980s and the U.S. subprime mortgage crisis of the 2000s are other examples of real estate bubbles. It is a well known fact that all these bubbles have ended up in severe recessions. Copeland (1949) clearly states that the money-flows accounts are dedicated to solve such problems. Obviously national accounts are the only statistics to depict the whole situation what is going on in the economy. However, the traditional production oriented System of National Accounts is not suitable to fully understand the mechanism of creation and burst of the bubble. The authors believe it is high time to revisit Copeland and construct an alternative more money oriented system of national accounts that precisely depicts the repercussions between the real and financial economy. In the appendix of the paper, one of such examples namely System of Real & Financial National Accounts (ReFiNA) will be proposed.

[12] See Chapter II of the book.

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Table 1 Copeland's Money-Flows Accounts of the United States (1936, billions of dollars)

		Households		Non-financial corporations		Non-financial non-farm private enterprises		Farms		The federal government		State and local governments	
		Uses	Resources	Uses	Resources	Uses	Resources	Uses	Resources	Uses	Resources	Uses	Resources
	Statement of payments												
1	Gross cash pay	0.8	41.0	22.9	–	6.9	–	0.7	–	4.0	–	3.6	–
2	Cash interest	1.4	2.8	1.8	0.4	0.4	0.1	0.5	–	0.9	0.5	0.6	0.1
3	Cash dividends	–	4.6	5.3	1.1	–	0.1	–	–	–	–	–	–
4	Gross rents	3.3	–	1.8	0.5	1.2	0.2	0.5	–	0.0	0.0	0.0	0.1
5	Insurance premiums	4.2	–	0.9	–	0.4	–	0.1	–	–	0.1	–	0.2
6	Insurance benefits	–	2.8	–	0.2	–	0.1	–	0.0	0.1	–	0.2	–
7	Public purpose payments	1.2	3.5	0.0	0.0	0.0	1.0	–	0.3	3.6	0.1	1.9	1.8
8	Taxes collected	2.6	–	5.0	–	1.5	–	0.5	–	–	4.2	–	6.8
9	Tax refunds	–	0.0	–	0.0	–	0.0	–	–	0.1	–	–	–
10	Net owner takeouts	–	8.0	–	–	4.3	–	3.1	–	–	–	–	–
11	Net payments for real estate transfers	–	0.6	0.1	–	0.1	–	–	0.1	0.0	–	–	–
12	Gross sales of goods and services	48.0	0.1	84.2	120.2	34.3	48.3	3.2	8.4	1.8	0.7	3.7	1.0
13	Ordinary sources and dispositions of money	61.3	63.3	122.1	122.5	49.1	49.7	8.5	8.8	10.6	5.6	9.9	10.0
	Statement of balances (December 31)												
14	Currency and deposits	31.8	–	8.9	–	5.2	–	1.9	–	2.0	–	3.5	–
15	Treasury currency	–	–	–	–	–	–	–	–	–	–	–	–
16	Accounts receivable/payable	–	3.1	16.1	12.6	6.9	5.5	–	1.6	0.0	0.1	–	–
17	Federal obligations	9.8	–	1.7	–	0.7	–	–	–	–	39.4	0.3	–
18	The other loans and securities	111.0	21.9	21.9	105.2	2.2	6.9	–	8.4	11.2	–	4.3	19.6
19	Total	152.6	24.9	48.7	117.8	15.0	12.3	1.9	10.0	13.2	39.6	8.0	19.6
	Computation of loanfund financing												
20	Net loanfund balance receivable, December 31	127.6	–	–	69.1	2.7	–	–	8.1	–	26.4	–	11.6
21	Increment in loanfund balance receivable	2.8	–	–0.3	–	0.5	–	0.3	–	–	5.1	0.3	–
22	Net gains and/or forgiven debts	–0.5	–	0.6	–	0.2	–	–	–	–	–0.1	–	–
23	Money advanced or returned less money obtained	2.3	–	0.3	–	0.7	–	0.3	–	–	5.0	0.3	–
	Sources and dispositions of money												
24	Ordinary sources and dispositions of money	61.3	63.3	122.1	122.5	49.1	49.7	8.5	8.8	10.6	5.6	9.9	10.0
25	Money advanced or returned less money obtained	2.3	–	0.3	–	0.7	–	0.3	–	–	5.0	0.3	–
26	Statistical discrepancy	–	0.3	0.1	–	–	0.1	–	–	–	0.1	–	0.2
27	Total	63.6	63.6	122.5	122.5	49.8	49.8	8.8	8.8	10.7	10.7	10.2	10.2

		Security and realty firms		Life insurance companies		Other insurance carriers		The banking system		Miscellaneous financial enterprises		The rest of the world		Total	
		Uses	Resources	Uses	Resources	Uses	Resources	Uses	Resources	Uses	Resources	Uses	Resources	Uses	Resources
	Statement of payments														
1	Gross cash pay	1.1	–	0.4	–	0.2	–	0.5	–	–	–	–	–	41.0	41.0
2	Cash interest	1.3	1.0	–	0.9	–	0.2	0.5	1.7	–	–	0.2	0.0	7.6	7.6
3	Cash dividends	1.6	1.4	0.0	0.0	0.1	0.1	0.2	0.0	–	–	0.2	0.2	7.5	7.5
4	Gross rents	0.3	6.1	0.0	0.2	0.0	0.0	0.1	0.1	–	–	–	–	7.2	7.2
5	Insurance premiums	0.3	–	0.2	3.5	0.1	2.4	0.1	–	–	–	–	–	6.2	6.2
6	Insurance benefits	–	0.1	1.9	–	1.1	–	–	0.0	–	–	–	–	3.3	3.3
7	Public purpose payments	0.0	–	–	–	–	–	–	–	–	–	0.0	0.2	6.8	6.8
8	Taxes collected	1.3	–	0.1	–	0.1	–	0.1	–	–	–	–	–	11.1	11.1
9	Tax refunds	–	–	–	–	–	–	–	–	–	–	–	–	0.1	0.1
10	Net owner takeouts	0.6	–	–	–	–	–	–	–	–	–	–	–	8.0	8.0
11	Net payments for real estate transfers	0.3	–	–	–0.2	–	–	–	–	–	–	0.0	–	0.5	0.5
12	Gross sales of goods and services	3.0	1.6	0.4	–	0.7	0.0	0.3	0.4	1.3	–	3.0	3.2	183.9	183.9
13	Ordinary sources and dispositions of money	9.7	10.1	3.0	4.4	2.3	2.7	1.8	2.2	1.3	–	3.4	3.7	283.0	283.0
	Statement of balances (December 31)														
14	Currency and deposits	1.9	–	0.8	–	0.5	–	–	58.6	0.8	–	1.3	–	58.6	58.6
15	Treasury currency	–	–	–	–	–	–	13.8	–	–	12.6	–	1.1	13.7	13.7
16	Accounts receivable/payable	–	0.2	–	–	–	–	–	–	–	–	–	–	23.0	23.0
17	Federal obligations	1.2	–	3.7	–	0.8	–	21.5	–	–	0.2	0.0	–	39.6	39.6
18	The other loans and securities	46.3	68.4	17.2	–	5.2	–	31.3	6.9	–	14.5	1.1	–	251.7	251.7
19	Total	49.4	68.6	21.7	–	6.4	–	66.6	65.4	0.8	27.3	2.4	1.1	386.6	386.6
	Computation of loanfund financing														
20	Net loanfund balance receivable, December 31	–	19.2	21.7	–	6.4	–	1.2	–	–	26.5	1.3	–	160.9	160.9
21	Increment in loanfund balance receivable	–	1.1	1.5	–	0.4	–	0.5	–	–	0.2	0.3	–	6.3	6.3
22	Net gains and/or forgiven debts	–	0.1	–	–	–	0.0	–0.1	–	–	0.1	–	–	0.2	0.2
23	Money advanced or returned less money obtained	–	1.2	1.5	–	0.4	0.0	0.4	–	–	0.3	0.3	–	6.5	6.5
	Sources and dispositions of money														
24	Ordinary sources and dispositions of money	9.7	10.1	3.0	4.4	2.3	2.7	1.8	2.2	1.3	–	3.4	3.7	283.0	283.0
25	Money advanced or returned less money obtained	–	1.2	1.5	–	0.4	–	0.4	–	–	0.3	0.3	–	6.5	6.5
26	Statistical discrepancy	1.6	–	–	0.1	–	–	–	–	–	1.0	–	–	1.7	1.7
27	Total	11.3	11.3	4.5	4.5	2.7	2.7	2.2	2.2	1.3	1.3	3.7	3.7	291.2	291.2

Note: Compiled by Shishido (1956) from Copeland (1952), Tables 18-27 and 40.

Appendix

System of Real & Financial National Accounts

(ReFiNA)

—A Tentative Proposal—

July 28, 2010

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1. Introduction

The purpose of the ReFiNA

1.1 The global need for a system of national accounts that depicts the interrelations between real and financial economy has been underscored by modern episodes of instability in real as well as in financial markets, ranging from the Asian debt crisis of the 1990s to the recent subprime mortgage crisis in the U.S. The System of Real & Financial National Accounts (ReFiNA) presented in this manual is meant to be an accounting structure for reporting real and financial macroeconomic data in monetary terms that summarize the transactions of groups of institutional units or institutional sectors.

The ReFiNA and the 2008 SNA

1.2 The ReFiNA shares many properties of the System of National Accounts (the 2008 SNA), which provides guidelines on national accounting for all countries throughout the world. Nevertheless, there are several differences between the ReFiNA and the 2008 SNA:

(a) while market prices are the basic reference for valuation in the 2008 SNA, the ReFiNA is fundamentally based on the historical cost accounting principles;

(b) while the 2008 SNA introduces various imputations into the accounts to cover wide range of intra-unit transactions and other non-market activities, the ReFiNA deliberately excludes such non-monetary transactions and activities from its accounts.

Stocks and flows

1.3 The ReFiNA records two basic kinds of information: stocks and flows. Stocks are holdings of assets and liabilities at a point in time. The accounts that show stocks are called balance sheets. There are two sets of balance sheets in the ReFiNA: (a) at the historical cost and (b) at the current market value. However, the latter is meant to be a supplement account in the ReFiNA. Flows are all the factors affecting the net worth that involve changes in the value of an institutional unit’s assets or liabilities. Flows refer to actions and effects of events that take place within a given period of time.

Assets and liabilities

1.4 A liability is established when one unit (the debtor) is obliged, under specific circumstances, to provide a payment or series of payments to another unit (the creditor). An asset is a means of carrying forward value from one accounting period to another. Assets as defined in the ReFiNA include financial claims, real rights and other legal rights of economic value. A financial claim is the payment or series of payments due to the creditor by the debtor under the terms of a liability. Financial claims are referred to as financial assets in the ReFiNA. The ReFiNA recognizes financial assets and liabilities only when the amount and the timing of payment(s) are precisely specified. A real right is the exclusive right to retain and/or use and/or obtain profit from and/or dispose of designated physical object. The other legal rights of economic value are those related to intangible properties for which no corresponding liabilities are recorded. The ReFiNA recognizes real rights and other legal rights when they are traded in the marketplace for the first time. However, the real rights are recorded in the supplementary balance sheets at the current market value if similar physical objects are commonly traded in the marketplace.

Transactions

1.5 A transaction is an economic flow that is an interaction between institutional units by mutual agreement. Transactions are interactions between two or more institutional units. Transactions recorded by the system are monetary transactions, where the units involved make or receive payments, or incur liabilities or receive assets denominated in units of currency. Payments are made in the form of bank transfers or by delivery of certificates of bank deposit such as banknotes or coins.

Other changes in assets and liabilities

1.6 There are some other changes in assets or liabilities that are not the result of transactions. They are either:
(a) Unrealized holding gains and losses; or
(b) Other changes in the volume of assets and liabilities.
The former only applies to the balance sheets at the current market value.

Holding gains and losses

1.7 Holding gains and losses result from changes in the prices of assets. They occur on all kinds of financial and non-financial assets, and on liabilities. Holding gains and losses accrue to the owners of assets and liabilities purely as a result of holding the assets or liabilities over time, without trading or transforming them in any way.

Institutional units

1.8 In order to describe balance sheets and the factors affecting them, the system groups institutional units into sectors on the basis of their principal functions, behavior and objectives. Institutional units are economic entities that are capable of owning goods and assets, of incurring liabilities, of engaging in economic activities and transactions with other units in their own right. For the purposes of the system, the institutional units are grouped together into six mutually exclusive institutional sectors composed of the following types of units:

(a) non-financial corporate business;
(b) financial institutions;
(c) non-financial government enterprises;
(d) general government;
(e) households;
(f) non-profit organizations.

Residents

1.9 A unit is said to be a resident unit of a country when it has a centre of economic interest on the economic territory of that country — that is, when it engages for an extended period (one year or more) in economic activities on this territory. The institutional sectors referred to above are groups of resident institutional units.

Rest of the world

1.10 Resident units engage in transactions with non-resident units. These transactions are the external transactions of the economy and are grouped in the rest of the world (ROW) account. So, in the system's accounting structure, the rest of the world plays a role similar to that of an institutional sector, although nonresident units are included only in so far as they are engaged in transactions with resident institutional units.

2. Accounting rules

Links with business accounting

2.1 The accounting rules and procedures used in the ReFiNA are based on those long used in business accounting. The traditional double-entry bookkeeping principle, whereby a transaction gives rise to a pair of matching debit and credit entries within the accounts of each of the two parties to the transaction, is a basic axiom of economic or national accounting. In general, a transaction between two different institutional units always requires four equal, simultaneous entries in the accounts of the ReFiNA, that is, quadruple entry accounting. These multiple entries enable the economic interactions between different institutional units and sectors to be recorded and analyzed in a consistent way.

Terminology for the two sides of the accounts

2.2 Balance sheets are presented with ‘liabilities and net worth’ (the difference between assets and liabilities) on the right side and ‘assets’ on the left. Comparison of two successive balance sheets shows changes in liabilities and net worth and changes in assets. The right side of the accumulation accounts, which records the direct factors affecting the balance sheets, is called ‘changes in liabilities and net worth’ and their left side is called ‘changes in assets’. The system employs the term ‘resources’ for the right side of the current accounts where transactions appear which add to the net worth of a unit or a sector. The left side of the accounts, which relates to transactions that reduce the net worth of a unit or sector, is termed ‘uses’.

Quadruple entry accounting

2.3 For a unit or sector, national accounting is based on the principle of double entry. Each transaction must be recorded twice, once as a resource (or a change in liabilities) and once as a use (or a change in assets). The total of transactions recorded as resources or changes in liabilities and the total of transactions recorded as uses or changes in assets must be equal, thus permitting a check on the consistency of the accounts. In practice though, national accounts — with all units and all sectors — are based on a principle of quadruple entry, since most transactions involve two institutional units. Each transaction of this type must be

recorded twice by the two transactors involved.

Balancing items

2.4 A balancing item is an accounting construct obtained by subtracting the total value of the entries on one side of an account from the total value on the other side. It cannot be measured independently of the other entries; as a derived entry, it reflects the application of the general accounting rules to the specific entries on the two sides of the account. Balancing items are not only devices introduced to ensure that accounts balance. They encapsulate a great deal of information and include some of the most important entries in the accounts, as can be seen from the following examples of balancing items: net worth, value added, disposable income, saving, etc.

General valuation principle

2.5 The system shows all flows and stocks in monetary terms. The basic principle of the ReFiNA is that the assets and liabilities are recorded at acquisition value, i.e. the value at which assets and liabilities have in fact changed hands; it means no revision shall be made to the original quadruple entry. Transactions are valued at the actual price agreed upon by the transactors. Historical costs are thus the basic reference for valuation in the ReFiNA.

Valuation of assets and liabilities

2.6 There are two sets of balance sheets in the ReFiNA: (a) at the historical cost and (b) at the current market value. In the latter case, assets and liabilities are recorded at current values at the time to which the balance sheet relates, not at their original valuation. The appropriate valuation basis for assets and liabilities is the value at which they might be bought in markets at the time the valuation is required. Ideally, values observed in markets or estimated from observed market values should be used. The revaluation account records those changes in the values of assets and liabilities that result from changes in their prices.

Time of recording

2.7 One implication of the quadruple entry accounting principle is that stocks of

financial assets and liabilities have to be recorded at the same point of time in the various accounts in question for both units involved. The same applies to transactions, or other flows.

General principles to the time of recording

2.8 When all entries relating to a transaction pertain only to stock of asset, they should be recorded when the ownership of the asset is transferred. This point in time is usually clear when the transaction involves the sale of existing assets. When the transaction involves the incurrence or redemption of a liability, both parties should record the transaction when the liability is incurred or redeemed. In most cases, this will occur when cash or some other financial asset is paid by the creditor to the debtor or repaid by the debtor to the creditor. When the counterpart to an entry in the stock account is in the flow account, the time of recording in the flow account is to be aligned with the time of recording in the stock account.

Netting and consolidation

2.9 Netting is a process whereby entries on alternate sides of the account for the same transaction item and same institutional unit are offset against one another. Consolidation refers to the elimination of financial assets and the counterpart liabilities and to the elimination from both uses and resources of transactions which occur between units that are grouped together. In general the preference of the ReFiNA is to avoid netting and consolidation where possible.

3. Sequence of accounts

Overview

3.1 The ReFiNA records flows and stocks in an ordered set of accounts describing the economic cycle from the generation of income, through its distribution and redistribution and finally to its accumulation in the form of assets. Each of the accounts shows transactions which balance out, either because of the definitions used or because a significant balance is carried forward to the next account.

Categories of accounts

3.2 The accounts are grouped in three categories:

(a) Current accounts;

(b) Accumulation accounts;

(c) Balance sheets.

The current accounts concern the generation, distribution and redistribution of income and its use in the form of final consumption. Finally, they permit the calculation of saving, which is an essential factor in accumulation. The accumulation accounts analyze the various components of changes in the assets and liabilities of the various units and enable changes in net worth (the difference between assets and liabilities) to be recorded. The balance sheets show the total assets and liabilities of the various units at the beginning and the end of the accounting period, together with their net worth. The flows for each asset and liability item recorded in the accumulation accounts are seen again in the stock accounts, which record the changes in the balance sheets.

Composition of current accounts

3.3 The sequence of the current accounts is composed of two main categories of accounts:

(a) Generation of income accounts:

1. Marketable goods and services account;
2. Taxes on products and imports account;
3. Financial and property transaction account;
4. Non-market activity account;

(b) Allocation and use of income accounts:

1. Allocation of primary income account;
2. Secondary distribution of income account;
3. Financial and property transaction account;
4. Use of disposable income account.

Marketable goods and services account

3.4 In the ReFiNA, there are three accounts that record how income arising: (a) from involvement in processes of production; or (b) from ownership of assets; or (c) from non-market activities such as those of the general government and of the non-profit

organizations. The marketable goods and services account shows the monetary transactions relating to the production process proper. Production is a physical process, carried out under the responsibility, control and management of an institutional unit, in which labor and assets are used to transform inputs of goods and services into outputs of other goods and services. The production boundary in the ReFiNA is more restricted than the general production boundary; all goods and services produced as outputs must be supplied to units other than their producers through monetary transactions on markets. All the income, arising from ownership or transaction of assets, is beyond the production boundary. The amount of a product available for use within the economy must have been supplied either by domestic production, by purchase of existing goods or by imports. The same amount of the product entering an economy in an accounting period must be used for intermediate consumption, final consumption, capital formation (including changes in inventories), maintenance of fixed assets or exports. Intermediate goods and services are those used up in the course of generation of income within the accounting period. All the services used in the course of generation of income are categorized in this class. The details of other classes of uses and resources are discussed in the following paragraphs. It should be noted that both uses and resources of this account is recorded at producers' prices, i.e. inclusive of taxes on products etc.

Value added and the taxes on products account

3.5 The balancing item in the marketable goods and services account is value added at producers' prices, which is also known as value added at market prices; it is essentially a measure of output and not income. As a measure of income, value added as a primary income, which is also known as value added at factor cost, is commonly used. It can easily be derived from value added at producers' prices presented above by subtracting the value of any taxes on products and imports, less subsidies on products.

Taxes on products and imports

3.6 A tax on a product is a tax that is payable per unit of some good or service. The tax may be a specific amount of money per unit of quantity of a good or service (the quantity units being measured either in terms of discrete units or continuous physical variables such as volume, weight, strength, distance, time, etc.), or it may be calculated ad valorem as a specified percentage of the price per unit or value of

the goods or services transacted. Taxes and duties on imports consist of taxes on goods and services that become payable at the moment when those goods cross the national or customs frontiers of the economic territory or when those services are delivered by non-resident producers to resident institutional units. A crucial part of the taxes on products and imports is the value added type tax. A value added type tax (VAT) is a tax on goods or services collected in stages by enterprises but that is ultimately charged in full to the final purchasers. They are described as a "deductible" tax because producers are not usually required to pay to the government the full amount of the tax they invoice to their customers, being permitted to deduct the amount of tax they have been invoiced on their own purchases of goods or services intended for intermediate consumption or fixed asset formation. VAT is usually calculated on the price of the good or service including any other tax on the product. VAT is also payable on imports of goods or services in addition to any import duties or other taxes on the imports.

Subsidies on products

3.7 Subsidies are current unrequited payments that government units, including non-resident government units, make to enterprises on the basis of the levels of their production activities or the quantities or values of the goods or services that they produce, sell or import. A subsidy on a product is a subsidy payable per unit of a good or service.

Financial and property transaction accounts

3.8 The third account of the generation of income accounts records how income arising from ownership or transaction of assets. The uses and resources are recorded in this account only if they are of the business nature. Otherwise, they are recorded in the account with the same name in the allocation and use of income accounts. Uses and resources of this account are categorized into five classes.

(a) Interest, rent and dividend

Interest is the income other than dividend arising from ownership of financial assets. Likewise, rent is the income arising from ownership of non-financial assets. Non-financial assets include fixed assets, valuables and non-produced assets. Dividend is the portion of corporate profits paid out to stockholders. Since dividend is payable out of corporate income after tax, the payment is recorded in the allocation and use of income accounts except for the case of the

ROW. Only the receipts of dividend are recorded in the present account.

(b) Non-life insurance

Non-life insurance policies provide cover against various events or accidents resulting in damage to assets or incurrence of liabilities as a result of natural or human causes or against financial losses resulting from events such as sickness, unemployment, accidents, etc. Such policies are taken out by business enterprises, government units, non-profit organizations or individual households. The policies taken out by individual households are recorded in the account with the same name in the allocation and use of income accounts if they are of the non-business nature. Uses and resources under this category record the monetary transactions between policyholders and underwriters.

(c) Sale of existing goods

Existing goods are goods that already have had a user but have not recorded as assets on the balance sheet. Sales of existing goods are recorded as resources in this account. The sales of existing goods by individual households are also recorded in this account because any sales generate income and are subject to income tax.

(d) Current transfers associated with asset transactions

In the historical cost accounting, a realized capital gain is recorded as a current transfer. A realized capital gain is the difference between the revenue from a sale of an asset and the cost paid out to obtain the particular asset. A capital gain is generated when an asset is either redeemed or sold in the secondary market. The current transfers of this nature are recorded as resources in this account. The capital gain accrued by individual households is also recorded in this account because it consists of income and is subject to income tax.

(e) Maintenance of fixed assets

Fixed assets are tangible or intangible assets produced as outputs from processes of production that are themselves used repeatedly, or continuously for more than one year. Fixed assets are recorded in the balance sheets when they are installed and erased when they are removed. In the ReFiNA, fixed assets are supposed to be kept at their designated capacity throughout their lifetime. The required costs to maintain the fixed assets at their designated capacity are recorded as uses in this account if they are of the business nature.

Non-market activity account

3.9 The last account of the generation of income accounts records non-market monetary

transactions carried out by business enterprises, general government or non-profit organizations. Non-market monetary transactions include payments of taxes, social benefits/contributions and other current transfers. All the monetary payments without any counterpart being received in return are treated as current transfers in the ReFiNA. The non-market monetary transactions carried out by individual households are recorded in the secondary distribution of income account in the allocation and use of income accounts if they are of the non-business nature.

(a) Collective final consumption expenditure

The collective final consumption expenditure of general government and non-profit organizations consists of the value of goods and services purchased from market producers, which are not for resale or for intermediate consumption or for capital formation. Social services provided by business enterprises, which are not directly related to the business operation, are also treated as collective consumption expenditures if consumption of goods and services are involved. The collective final consumption expenditures are recorded as uses in this account.

(b) Taxes and subsidies on products

See paragraphs 3.6 and 3.7 above.

(c) Taxes on wealth, etc.

Taxes on wealth, etc. consist mainly of taxes on wealth that are payable regularly every tax period or are levied when some event such as inheritance takes place. However, this category covers all the taxes other than taxes on products/imports and taxes on income. The taxes payable by individual households are recorded in the secondary distribution of income account in the allocation and use of income accounts if they are of the non-business nature.

(e) Taxes on income

Taxes on income consist of both taxes on the incomes of households and taxes on profits of corporations. Since taxes on income are payable out of incomes or profits, the payments are recorded as uses in the secondary distribution of income account in the allocation and use of income accounts even if it is of a business nature. Thus only the receipts of the taxes by general government are recorded as resources in this account.

(f) Social benefits and contributions

Social benefits are current transfers received by households intended to provide for the needs that arise from certain events or circumstances, for example, sickness, unemployment, retirement, housing, education or family circumstances. Social benefits may be provided under social insurance schemes or by social

assistance. Social insurance benefits in kind provided by employers, which involve no monetary transactions between employers and employees, are treated as if the goods and services concerned would have to be shown as incurred by employers. However, the goods and services are treated not as intermediate goods and services but as collective consumption expenditure. Social contributions are monetary payments to social insurance schemes to make provision for social insurance benefits to be paid. Social contributions may be made by employers on behalf of their employees. The receipts of social benefits and the payment of social contributions by the individual households are recorded in the secondary distribution of income account in the allocation and use of income accounts. All other payments/receipts of social benefits/contributions are recorded in this account.

(g) Other current transfers

Other current transfers consist of all current transfers between resident institutional units, or between resident and non-resident units, mentioned nowhere else in this section. The group includes current transfers between different kinds of government units, usually at different levels of government, and also between general government and foreign governments, as well as current transfers to and from non-profit organizations and between resident and non-resident households. The receipts and payment of current transfers by the individual households are recorded in the secondary distribution of income account in the allocation and use of income accounts. All other payments/receipts of current transfers are recorded in this account.

(h) Losses associated with diminution in volume of assets

In the ReFiNA, the other diminution in volume of assets account (ODVA) records the changes in assets, liabilities, and net worth between opening and closing balance sheets that are due neither to transactions between institutional units nor to revaluation. Since such diminution in volume of assets or liabilities brings loss to the institutional unit concerned, it is recorded in the non-market account if it is of a business nature. It is an equivalent of the extraordinary loss in the business accounting.

Allocation of primary income account

3.10 Unlike the generation of income accounts, the allocation of primary income account concerns the resident units and institutional sectors as recipients rather than producers of primary income. The main source of the primary income is (I) value

added as primary income, which is the balancing item in the taxes on products account. However, there are two additional sources of primary income: (II) financial and property transactions and (III) non-market activities. The allocation of primary income account shows where the items payable in the generation of income account are receivable. A great proportion of the primary income is paid out from the institutional sectors, which are directly involved in the economic activities, to households and ROW as compensation of employees.

Compensation of employees

3.11 Compensation of employees is defined as the total monetary remuneration directly payable by an employer to an employee in return for work done by the latter during the accounting period. Employees in the ReFiNA are defined as all persons, excluding self-employed persons, engaged in some economic activities that generate primary income. Self-employed persons are persons who are the sole or joint owners of the unincorporated enterprises in which they work, excluding those unincorporated enterprises that are classified as quasi-corporations. Compensation of employees in kind provided by employers, which involve no monetary transactions between employers and employees, are treated as if the goods and services concerned would have to be shown as incurred by employers. However, the goods and services are treated not as intermediate goods and services but as collective consumption expenditure.

Secondary distribution of income account

3.12 The receipts of social benefits and the payment of taxes on income, wealth, etc., social contributions and other current transfers by the individual households are recorded in this account. The taxes on income payable by other institutional sectors are also recorded as uses in this account. Losses associated with diminution in volume of assets will be recorded in this account if it is of a non-business nature. The balancing item of the account is disposable income, which reflects current transactions and explicitly excludes capital transfers, unrealized holding gains and losses.

Use of disposable income account

3.13 The use of disposable income account includes the concept of individual final

consumption expenditure and individual imports financed by the households. Individual final consumption expenditure covers transactions in final consumption of goods and services for which a sector is the direct bearer of the expense. Final consumption consists of goods and services used by individual households or the community to satisfy their individual or collective needs or wants. The final consumption, which is not categorized as individual final consumption expenditure, is classified as collective final consumption expenditure. The balancing item in the use of disposable income account is saving. Saving ends the subsequence of current accounts.

Accumulation accounts

3.14 The accumulation accounts are those that record flows that directly affect the entries in the balance sheets at the start and end of the accounting period. They appear both in the flow accounts and in the stock accounts. There are three accumulation accounts, which appear in the flow accounts:

(a) Capital account;

(b) Secondary market asset transaction account;

(c) Primary market financial transaction account.

The link between the accumulation accounts and the current accounts is provided by the fact that saving must be used to acquire financial or non-financial assets of one kind or another. When saving is negative, the excess of consumption over disposable income must be financed by disposing of assets or incurring liabilities.

Capital account

3.15 The capital account is the first of three accounts dealing with the accumulation of assets and liabilities through the transactions between institutional units. The purpose of the capital account is to record the values of the newly produced non-financial assets that are acquired by resident institutional units by engaging in transactions and to show the change in net worth due to saving. The right-hand side of the capital account records the resources available for the accumulation of assets. This consists of net saving, the balancing item carried forward from the use of income account. The left-hand side of the capital account records the acquisition of the non-produced asset, which have not had a user before. The acquisition of the assets is categorized into three classes.

(a) Changes in inventories

Changes in inventories are measured by the value of the entries into inventories less the value of withdrawals during the accounting period. Inventories are produced assets that consist of goods and services, which came into existence in the current period or in an earlier period, and that are held for sale, use in production or other use at a later date. Produced assets are assets that have come into existence as outputs from production processes that fall within the production boundary of the ReFiNA. In the historical cost accounting, which ReFiNA is based on, the inventories are recognized when they are traded in the marketplace for the first time. Work in progress and the finished goods, which have not had traded in the marketplace, are recorded as inventories at the acquisition cost of the original materials and supplies, which have been used in the production process.

(b) Fixed asset formation

The activity of fixed asset formation is defined as the value of their acquisitions of fixed assets, which have not had a user before. Fixed assets are produced assets in use or in use in the past. The distinction between intermediate or final consumption and capital formation depends on whether the goods involved are completely used up in the accounting period or not. If they are, the use of them is a current transaction recorded either as input of intermediate goods or final consumption expenditure; if not it is an accumulation transaction recorded in the capital account. All the services are categorized either as input of intermediate goods or final consumption expenditure. Ordinary maintenance and repairs undertaken by the owners to keep fixed assets at their designated capacity are treated as maintenance of fixed assets in the current accounts. However, major improvements, additions or extensions to fixed assets, which increase their capacity beyond original design, count as fixed asset formation.

(c) Acquisitions of newly produced valuables

Valuables are produced assets of exceptionally high economic value because of the difficulty in reproduction or replacement. Valuables consist of antiques and other art objects, rare jewelry, objects of historical value, etc. However, only acquisitions of newly produced valuables are recorded in the capital account.

Secondary market asset transaction account

3.16 The second account of the accumulation accounts records the secondary market asset transactions. The secondary market is the asset market where already existing assets are traded. All sort of non-produced assets belong to this category. Produced

assets, which have been traded at least once, and financial assets created earlier also belong to this category. Non-produced assets are non-financial assets that have come into existence in ways other than through processes of production. External financial assets are financial claims against the ROW. When an external financial asset is sold to the ROW, it is recorded in the primary market financial transaction account as if it is redeemed at that time.

Current transfers associated with asset transactions

3.17 The fundamental principle of the ReFiNA, which is based on the historical cost accounting rules, is that the assets and liabilities are recorded at acquisition cost. For the vendee of an asset, the acquisition cost is the market value at which the asset has changed hands. However, for the vendor, the selling price could be different from the book value, which reflects the acquisition cost, because of asset price fluctuations. If it is the case, the transaction of the asset is recorded at the book value of the vendor and the difference between the market value and the book value is recorded as current transfer associated with asset transaction. It is a current transfer because, for the vender, it is an additional source of income so that it is recorded on the resources side of the financial and property transaction account that belongs to the generation of income accounts. It should be noted, however, the acquisition cost of the vendee is the market value, at which the asset has actually changed hands, i.e. the sum of the book value of the vendor and the current transfer associated with asset transaction. Thus the current transfer associated with asset transactions is a portion of saving of the vendee so that it is recorded on the use side of the secondary market asset transaction account that belongs to the accumulation accounts. This is the peculiar feature of the secondary market asset transactions. In this sense, the sequence of the accounts is not a one-way relation but it consists of a loop. This loop explains the feedback process between real and financial markets.

Capital transfers

3.18 As already mentioned in paragraph 1.3 above, the current and accumulation accounts of the ReFiNA records only the factors affecting the balance sheets that involve changes in the value of an institutional unit’s assets or liabilities. For this reason, most of the non-monetary transactions are not recorded in the ReFiNA. The only exception is the capital transfers. Since they are non-monetary transactions of assets, they inevitably affect the value of the assets recorded in the balance sheet.

Such capital transfer consists of the transfer of ownership of an asset without any counterpart being received in return. All the monetary payments without any counterpart being received in return are treated as current transfers in the ReFiNA. Capital transfers are recorded in the secondary market asset transaction account at the book value of the donor, and same amount is recorded as a negative current transfer from the donee to the donor; thus the acquisition cost to the new owner of the asset is zero.

Primary market financial transaction account

3.19 The primary market financial transaction account is the final account in the full sequence of accounts that records transactions between institutional units. Saving is the balancing item of the use of income accounts, and saving can be used to accumulate produced assets. Existing assets, including not only produced assets but also non-produced and financial assets, are traded in the secondary market as well. If they are not exhausted in this way, the resulting surplus is called net lending (if it is positive) or net borrowing (if it is negative). Net lending or net borrowing, is the balancing item that is carried forward from the secondary market asset transaction account into the primary market financial transaction account. The financial account does not have a balancing item that is carried forward to another account, as has been the case with all the accounts discussed in previous paragraphs. It simply explains how net lending or net borrowing is affected by means of acquisition of financial assets or incurrence of liabilities. The sum of these changes is conceptually equal in magnitude, but on the opposite side of the account, to the balancing item of the secondary market asset transaction account.

Redemption of liabilities

3.20 The primary market financial transaction account records both creation and redemption of financial assets and liabilities. As in the case of the secondary market transactions, there could be a difference between the book value of the financial assets and the redemption value. If it is the case, the redemption of the asset is recorded at the book value of the last asset holder and the difference between the redemption value and the book value is recorded as current transfer associated with redemption of liabilities. When an external financial asset is sold to the ROW in the secondary market, it is recorded in the primary market financial transaction account as if it is redeemed at that time.

Balance of payments

3.21 The balance of payments is a statistical statement that summarizes transactions between residents and nonresidents during a period. The accounts correspond to the ROW accounts of the ReFiNA. They differ in that the balance of payments is from the perspective of the resident sectors, whereas national accounts data for the ROW are from the perspective of nonresidents. The balance of payments consists of six current accounts of the ReFiNA: the marketable goods and services account, the financial and property transaction account, the non-market activity account, the allocation of primary income account, the secondary market asset transaction account, and the primary market financial transaction account. The balancing items of the first three accounts that belong to the generation of income accounts are: (i) external balance of goods and services, (ii) balance of investment income, and (iii) balance of current transfers. The sum of (i), (ii), (iii) and the net payment of compensation of employees between resident and non-resident units makes the current external balance. The value of the current account balance equals the saving-investment gap for the national economy. The current external balance is carried forward from the allocation of primary income account into the secondary market asset transaction account. The sum of the current external balance and the balance on the secondary market asset transaction account represents the net lending (surplus) or net borrowing (deficit) by the economy with the ROW. This is conceptually equal to the net balance of the primary market financial transaction account. In other words, the last of the flow accounts measures how the net lending to or borrowing from nonresidents is financed. The financial account plus the other changes in volume of asset account explain the change in the balance sheets of the ROW between beginning- and end-periods.

Balance sheets

3.22 A balance sheet is a statement, drawn up in respect of a particular point in time, of the values of assets owned and of the liabilities owed by an institutional unit or group of units. The financial and non-financial resources at the disposal of an institutional unit or sector shown in the balance sheet provide an indicator of economic status. These resources are summarized in the balancing item, net worth. Net worth is defined as the value of all the assets owned by an institutional unit or sector less the value of all its outstanding liabilities. For the economy as a whole, the

balance sheet shows the sum of non-financial assets and net claims on the rest of the world. This sum is often referred to as national wealth that corresponds to the net worth of the ROW but with an opposite sign.

Changes in the balance sheets

3.23 A basic accounting identity links the opening balance sheet and the closing balance sheet for a given asset. In the historical cost accounting, the value of the stock of a specific type of asset in the opening balance sheet; plus (a) the total value of the same type of asset acquired less disposed of, in transactions that take place within the accounting period; plus (b) the value of other negative changes in the volume of these assets held; equals the value of the stock of the asset in the closing balance sheet. The above rule applies to the stock of liabilities as well. In the market value accounting there is an additional factor of changes in the balance sheets: (c) the revaluations. The accounts that record (a) above are: the capital account, the secondary market asset transaction account, and the primary market financial transaction account, which are included in the flow accounts.

Other diminution in volume of assets account

3.24 The other diminution in volume of assets account (ODVA) records the changes in assets, liabilities, and net worth between opening and closing balance sheets that are due neither to transactions between institutional units nor to revaluation. One of the main functions of the ODVA in the ReFiNA is to record the removal of fixed assets other than by transactions. In usual cases, machineries or buildings are removed at owners' discretion because of high maintenance costs or low utilization rates. The diminution in the value of fixed assets because of poor maintenance is also recorded in the same manner. In addition to that, there are three principal causes of disappearance of an asset, that are not related to the nature of the asset nor to the intention of the owner but to conditions prevailing in the economy that impact ownership of assets. These are catastrophic losses, uncompensated seizures and other volume changes of assets. The volume changes recorded as catastrophic losses in the ODVA are the result of natural disasters, war or similar events. Uncompensated seizures occur when governments or other institutional units take possession of the assets of other institutional units, including non-resident units, without compensation. Some financial events are also recorded in the ODVA. Unilateral recognition by a creditor that a financial asset can no longer be collected,

due to bankruptcy or other factors, and the consequent removal by the creditor of that financial asset from his balance sheet should be accounted for here, along with the removal of the counterpart liability of the debtor.

Revaluation account

3.25 The revaluation account records unrealized holding gains or losses accruing during the accounting period to the owners of financial and non-financial assets and liabilities. A holding gain (loss) is realized when an asset that has increased (decreased) in value due to holding gains (losses) since the beginning of the accounting period is sold, redeemed, used or otherwise disposed of, or a liability incorporating a holding gain or loss is repaid. An unrealized holding gain is one accruing on an asset that is still owned or a liability that is still outstanding at the end of the accounting period. Holding gains or losses on assets are recorded on the left-hand side of the account and those on liabilities on the right-hand side.

System of Real & Financial National Accounts (July 29, 2010)
Flow Accounts (Factors affecting the balance sheets)

	Uses	Resources	Code	Corresponding Rows	Non-financial corporate business		Financial institutions		Non-financial government enterprises		General government		Households		Non-profit organizations		Rest of the world	
					Uses	Resources	Uses	Resources	Uses	Resources	Uses	Resources	Uses	Resources	Uses	Resources	Uses	Resources
Current accounts																		
Generation of income accounts																		
Marketable goods and services account	Input of intermediate goods and services		A1	A1=A2	x		x		x			z		x				
(At producers' prices)		Output of intermediate goods and services	A2	A2=A1		x		x		x		x	z			x		
		Collective final consumption expenditure	A3	A3=D1		x		x		x		x		z		x		
		Individual final consumption expenditure	A4	A4=H1		x		x		x		x		z		x		
		Changes in inventories (+/−)	A21	A21=I21		x				x				z		x		
		fixed asset formation	A31	A31=I31		x				x				z		x		
		Maintenance of fixed assets	A32	A32=G32+G31		x				x				z		x		
		Acquisitions of newly produced valuables	A41	A41=I41		x				x				z		x		
	Purchase of existing goods		A5	A5=C6	x		x		x		x		z		x			
	Imports of goods and services		A6	A6+H2=A7	x		x		x		x		z		x			x
		Exports of goods and services (ROW)	A7	A7=A6+H2														
	Imports of goods and services (ROW)		A8	A8=A9													x	
		Exports of goods and services	A9	A9=A8		x		x		x		x		z		x		
	Value added at producers' prices		AZ	AZ=BX	x		x		x		x		z		x			
	External balance of goods and services (i)		AY	AY+CY+DY=EW													x	
Taxes on products account		Value added at producers' prices	BX	BX=AZ		x		x		x		x		z		x		
	Taxes on products and imports		B1	B1=D2	x		x		x		x		z		x			
		Subsidies on products	B2	B2=D3		x		x		x		x		z		x		
	Value added as a primary income (I)		BZ	BZ+CZ+DZ=EX	x		x		x		x		z		x			
Financial and property transaction account	Interest and rent		C1	C1+C2+G1+G2=C3	x		x		x		x		z		x		x	
(as a generation of income account)	Dividend (ROW)		C2	C2+C1+G1+G2=C3													x	
		Interest, rent and dividend	C3	C3=C1+C2+G1+G2		x		x		x		x		x		x		x
	Non-life insurance		C4	C4+G3=C5+G4	x		x		x		x		z		x		x	
		Non-life insurance	C5	C5+G4=C4+G3		x		x		x		x		z		x		x
		Sale of existing goods	C6	C6=A5		x		x		x		x		x		x		
		Current transfers associated with asset transactions																
		of which fixed assets(+/−)	C31	C31=J32		x		x		x		x		x		x		
		of which valuables (+/−)	C41	C41=J42		x		x		x		x		x		x		
		of which non-produced assets (+/−)	C51	C51=J52		x		x		x		x		x		x		
		of which financial assets (+/−)	C61	C61=J62		x		x		x		x		x		x		x
		of which external financial assets (+/−)	C71	C71=J72		x		x		x		x		x		x		
		Current transfers associated with redeption of liabilities (+/−)	C81	C81=K82		x		x		x		x		x		x		x
		Current transfers associated with remission of liabilities (ROW) (+/−)	C91	C91=K92		x		x		x		x		x		x		
	Maintenance of fixed assets		C32	C32+G31=A32	x		x		x		x		z		x			
	Additional source of primary income (II)		CZ	CZ+BZ+DZ=EX	x		x		x		x		x		x			
	Balance of investment income (ii)		CY	CY+AY+DY=EW													x	
Non-market activity account	Collective final consumption expenditure		D1	D1=A3								x						
		Taxes on products and imports	D2	D2=B1										x				
	Subsidies on products		D3	D3=B2								x						
	Taxes on wealth, etc.		D4	D4+F2=D5	x		x		x			z		x			x	
		Taxes on wealth, etc.	D5	D5=D4+F2														x
	Taxes on income (ROW)		D6	D6+F1=D7													x	
		Taxes on income	D7	D7=D6+F1														x
	Social benefits other than social transfers in kind		D8	D8=F3	x		x		x		x		z		x		x	
	Social Contributions		D9	D9+F4=D10	x		x		x		x		z		x		x	
		Social Contributions	D10	D10=D9+F4		x		x		x		x		z		x		x
	Other current transfers		D11	D11+F5=D12+F6	x		x		x		x		z		x		x	
		Other current transfers	D12	D12+F6=D11+F5		x		x		x		x		z		x		x
	Losses associated with diminution in volume of assets																	
	of which Inventories		D21	D21+F21=−M21	x				x		x		z		x			
	of which Fixed assets (removals)		D31	D31+F31=−M31	x		x		x		x		x		x			
	of which Fixed assets (other changes)		D32	D32+F32=−M32	x		x		x		x		x		x		x	
	of which Valuables		D41	D41+F41=−M41	x		x		x		x		x		x		x	
	of which Non-produced assets		D51	D51+F51=−M51	x		x		x		x		x		x		x	
	of which Financial assets		D61	D61+F61=−M61	x		x		x		x		x		x		x	
	of which External financial assets		D71	D71+F71=−M71	x		x		x		x		x		x			
		Gains associated with diminution in volume of liabilities																
		of which Liabilities	D81	D81+F81=−M81		x		x		x		x		x		x		
		of which Liabilities (ROW)	D91	D91+F91=−M91														x
	Additional source of primary income (III)		DZ	DZ+BZ+CZ=EX	x		x		x		x		x		x			
	Balance of current transfers (iii)		DY	DY+AY+CY=EW													x	
Allocation and use of income accounts																		
Allocation of primary income account		Primary income (I)+(II)+(III)	EX	EX=BZ+CZ+DZ		x		x		x		x		x		x		
		i+ii+iii	EW	EW=AY+CY+DY														x
	Compensation of employees		E1	E1=E2	x		x		x		x		x		x		x	
		Compensation of employees	E2	E2=E1										x				x
	Balance of primary incomes		EZ	EZ=FX	x		x		x		x		x		x			
	Current external balance		EY	EY=JW													x	
Secondary distribution of income account		Balance of primary incomes	FX	FX=EZ		x		x		x		x		x		x		
	Taxes on income		F1	F1+D6=D7	x		x		x				x		x			
	Taxes on wealth, etc.		F2	F2+D4=D5									x					
		Social benefits other than social transfers in kind	F3	F3=D8										x				
	Social Contributions		F4	F4+D9=D10									x					
	Other current transfers		F5	F5+D11=D12+F6									x					
		Other current transfers	F6	F6+D12=D11+F5										x				
	Losses associated with diminution in volume of assets																	
	of which Inventories		F21	F21+D21=−M21									x					
	of which Fixed assets (removals)		F31	F31+D31=−M31									x					
	of which Fixed assets (other changes)		F32	F32+D32=−M32									x					
	of which Valuables		F41	F41+D41=−M41									x					
	of which Non-produced assets		F51	F51+D51=−M51									x					
	of which Financial assets		F61	F61+D61=−M61									x					
	of which External financial assets		F71	F71+D71=−M71									x					
		Gains associated with diminution in volume of liabilities																
		of which Liabilities	D81	F81+D81=−M81										x				
		of which Liabilities (ROW)	D91	F91+D91=−M91										x				
	Disposable income		FZ	FZ=GX	x		x		x		x		x		x			
Financial and property transaction account		Disposable income	GX	GX=FZ		x		x		x		x		x		x		
(as an allocation of income account)	Interest and rent		G1	G1+C1+C2+G2=C3									x					
	Dividend		G2	G2+C1+C2+G1=C3	x		x											
	Non-life insurance		G3	G3+C4=C5+G4									x					
		Non-life insurance	G4	G4+C5=C4+G3										x				
	Maintenance of fixed assets		G31	G31+C32=A32									x					
	Discretionary income		GZ	GZ=HX	x		x		x		x		x		x			
Use of disposable income account		Discretionary income	HX	HX=GZ		x		x		x		x		x		x		
	Individual final consumption expenditure		H1	H1=A4									x					
	Individual imports		H2	H2+A6=A7									x					
	Saving		HZ	HZ=IX	x		x		x		x		x		x			
Accumulation accounts																		
Capital account		Saving	IX	IX=HZ		x		x		x		x		x		x		
	Changes in inventories (+/−)		I21	I21=A21	x				x		x		z		x			
	fixed asset formation		I31	I31=A31	x		x		x		x		x		x			
	Acquisitions of newly produced valuables		I41	I41=A41	x		x		x		x		x		x			
	Balance of saving and investment		IZ	IZ=JX	x		x		x		x		x		x		x	
Secondary market asset transaction account		Balance of saving and investment	JX	JX=IZ		x		x		x		x		x		x		x
		Current external balance	JW	JW=EY														
	Fixed assets (+/−)		J31	unilaterally balanced	x		x		x		x		x		x		x	
	Valuables (+/−)		J41	unilaterally balanced	x		x		x		x		x		x		x	
	Non-produced assets (+/−)		J51	unilaterally balanced	x		x		x		x		x		x		x	
	Financial assets (+/−)		J61	unilaterally balanced	x		x		x		x		x		x		x	
	Exteranal financial assets (+/−)		J71	unilaterally balanced	x		x		x		x		x		x			
	Current transfers associated with asset transactions																	
	of which fixed assets(+/−)		J32	J32=C31	x		x		x		x		x		x		x	
	of which valuables (+/−)		J42	J42=C41	x		x		x		x		x		x		x	
	of which non-produced assets (+/−)		J52	J52=C51	x		x		x		x		x		x		x	
	of which financial assets (+/−)		J62	J62=C61	x		x		x		x		x		x		x	
	of which external financial assets (+/−)		J72	J72=C71	x		x		x		x		x		x			
	Net lending / net borrowing		JZ	JZ=KX	x		x		x		x		x		x		x	
Primary market financial transaction account		Net lending / net borrowing	KX	KX=JZ		x		x		x		x		x		x		x
	Acquisition/redemption of financial assets (+/−)		K61	K61=K81	x		x		x		x		x		x		x	
	Acquisition/disposal of external financial assets (+/−)		K71	K71=K91	x		x		x		x		x		x			
		Incurrence/redemption of liabilities (+/−)	K81	K81=K61		x		x		x		x		x				
		Incurrence/remission of liabilities (ROW) (+/−)	K91	K91=K71														x
		Current transfers associated with redeption of liabilities (+/−)	K82	K82=C81		x		x		x		x		x				
		Current transfers associated with remission of liabilities (ROW) (+/−)	K92	K92=C91														x

System of Real & Financial National Accounts (July 29, 2010)
Stock Accounts (at historical cost)

	Uses	Resources	Code		Non-financial corporate business		Financial institutions		Non-financial government enterprises		General government		Households		Non-profit organizations		Rest of the world	
					Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
Opening balance sheet (at historical cost)																		
	Inventories		L21		x				x		x		z		x			
	Fixed assets		L31		x		x		x		x		x		x			
	Valuables		L41		x		x		x		x		x		x			
	Non-produced assets		L51		x		x		x		x		x		x			
	Financial assets		L61		x		x		x		x		x		x		x	
	External financial assets		L71		x		x		x		x		x		x			
		Liabilities	L81			x		x		x		x		x		x		
		Liabilities (ROW)	L91															x
		Net worth	LZ			x		x		x		x		x		x		
		Net external assets	LY															x
Accumulation accounts																		
Capital account		Saving	IX	IX=HZ		x		x		x		x		x		x		
	Changes in inventories (+/−)		I21	I21=A21	x				x		x		z		x			
	Gross fixed capital formation		I31	I31=A32	x		x		x		x		x		x			
	Acquisition of newly produced valuables		I41	I41=A41	x		x		x		x		x		x			
	Balance of saving and investment		IZ	IZ=JX	x		x		x		x		x		x		x	
Secondary market asset transaction account		Balance of saving and investment	JX	JX=IZ		x		x		x		x		x		x		x
		Current external balance	JW	JW=EY														
	Fixed assets (+/−)		J31	unilaterally balanced	x		x		x		x		x		x		x	
	Valuables (+/−)		J41	unilaterally balanced	x		x		x		x		x		x		x	
	Non-produced assets (+/−)		J51	unilaterally balanced	x		x		x		x		x		x		x	
	Financial assets (+/−)		J61	unilaterally balanced	x		x		x		x		x		x		x	
	Exteranal financial assets (+/−)		J71	unilaterally balanced	x		x		x		x		x		x			
	Current transfers associated with asset transactions	Current transfers associated with asset transactions																
	of which fixed assets (+/−)		J32	J32=C31	x		x		x		x		x		x		x	
	of which valuables (+/−)		J42	J42=C41	x		x		x		x		x		x		x	
	of which non-produced assets (+/−)		J52	J52=C51	x		x		x		x		x		x		x	
	of which financial assets (+/−)		J62	J62=C61	x		x		x		x		x		x		x	
	of which external financial assets (+/−)		J72	J72=C71	x		x		x		x		x		x			
	Net lending / net borrowing		JZ	JZ=KX	x		x		x		x		x		x		x	
Primary market financial transaction account		Net lending / net borrowing	KX	KX=JZ		x		x		x		x		x		x		x
	Acquisition/redemption of financial assets (+/−)		K61	K61=K81	x		x		x		x		x		x		x	
	Acquisition/disposal of external financial assets (+/−)		K71	K71=K91	x		x		x		x		x		x			
		Incurrence/redemption of liabilities (+/−)	K81	K81=K61		x		x		x		x		x		x		
		Incurrence/remission of liabilities (ROW) (+/−)	K91	K91=K71														x
		Current transfers associated with redeption of liabiliti	K82	K82=C81		x		x		x		x		x		x		
		Current transfers associated with remission of liabiliti	K92	K92=C91														x
Other diminution in volume of assets account																		
	Inventories (−)		M21	M21=−D21−F21	x				x		x		z		x			
	Fixed assets (removals) (−)		M31	M31=−D31−F31	x		x		x		x		x		x			
	Fixed assets (other changes) (−)		M32	M32=−D32−F32	x		x		x		x		x		x		x	
	Valuables (−)		M41	M41=−D41−F41	x		x		x		x		x		x		x	
	Non-produced assets (−)		M51	M51=−D51−F51	x		x		x		x		x		x		x	
	Financial assets (−)		M61	M61=−D61−F61	x		x		x		x		x		x		x	
	External financial assets (−)		M71	M71=−D71−F71	x		x		x		x		x		x			
		Liabilities (−)	M81	M81=−D81−F81		x		x		x		x		x		x		
		Liabilities (ROW) (−)	M91	M91=−D91−F91														x
		Net worth	MZ			x		x		x		x		x		x		
		Net external assets	MY															x
Closing balance sheet (at historical cost)																		
	Inventories		N21	N21=L21+I21+M21	x				x		x		z		x			
	Fixed assets		N31	N31=L31+I31+J31+J32+M31+M32	x		x		x		x		x		x			
	Valuables		N41	N41=L41+I41+J41+J42+M41	x		x		x		x		x		x			
	Non-produced assets		N51	N51=L51+J51+J52+M51	x		x		x		x		x		x			
	Financial assets		N61	N61=L61+J61+J62+K61+M61	x		x		x		x		x		x		x	
	External financial assets		N71	N71=L71+J71+J72+K71+M71	x		x		x		x		x		x			
		Liabilities	N81	N81=L81+J81+J82+K81+K82+M81		x		x		x		x		x		x		
		Liabilities (ROW)	N91	N91=L91+K91+K92+M91														x
		Net worth	NZ			x		x		x		x		x		x		
		Net external assets	NY															x

System of Real & Financial National Accounts (July 29, 2010)
Stock Accounts (at current market value)

	Uses	Resources	Code		Non-financial corporate business		Financial institutions		Non-financial government enterprises		General government		Households		Non-profit organizations		Rest of the world	
					Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities	Assets	Liabilities
Opening balance sheet (at current market value)																		
	Inventories		O21		x				x		x		z		x			
	Fixed assets		O31		x		x		x		x		x		x			
	Valuables		O41		x		x		x		x		x		x			
	Non-produced assets		O51		x		x		x		x		x		x			
	Financial assets		O61		x		x		x		x		x		x		x	
	External financial assets		O71		x		x		x		x		x		x			
		Liabilities	O81			x		x		x		x		x		x		x
		Liabilities (ROW)	O91															
		Net worth	OZ			x		x		x		x		x		x		
		Net external assets	OY															x
Accumulation accounts																		
Capital account		Saving	IX	IX=HZ		x		x		x		x		x		x		
	Changes in inventories (+/−)		I21	I21=A21	x				x		x		z		x			
	Gross fixed capital formation		I31	I31=A32	x		x		x		x		x		x			
	Acquisition of newly produced valuables		I41	I41=A41	x		x		x		x		x		x			
	Balance of saving and investment		IZ	IZ=JX	x		x		x		x		x		x		x	
Secondary market asset transaction account		Balance of saving and investment	JX	JX=IZ		x		x		x		x		x		x		x
		Current external balance	JW	JW=EY														
	Fixed assets (+/−)		J31	unilaterally balanced	x		x		x		x		x		x		x	
	Valuables (+/−)		J41	unilaterally balanced	x		x		x		x		x		x		x	
	Non-produced assets (+/−)		J51	unilaterally balanced	x		x		x		x		x		x		x	
	Financial assets (+/−)		J61	unilaterally balanced	x		x		x		x		x		x		x	
	Exteranal financial assets (+/−)		J71	unilaterally balanced	x		x		x		x		x		x			
	Current transfers associated with asset transactions	Current transfers associated with asset transactions																
	of which fixed assets (+/−)		J32	J32=C31	x		x		x		x		x		x		x	
	of which valuables (+/−)		J42	J42=C41	x		x		x		x		x		x		x	
	of which non-produced assets (+/−)		J52	J52=C51	x		x		x		x		x		x		x	
	of which financial assets (+/−)		J62	J62=C61	x		x		x		x		x		x		x	
	of which external financial assets (+/−)		J72	J72=C71	x		x		x		x		x		x			
	Net lending / net borrowing		JZ	JZ=KX	x		x		x		x		x		x		x	
Primary market financial transaction account		Net lending / net borrowing	KX	KX=JZ		x		x		x		x		x		x		x
	Acquisition/redemption of financial assets (+/−)		K61	K61=K81	x		x		x		x		x		x		x	
	Acquisition/disposal of external financial assets (+/−)		K71	K71=K91	x		x		x		x		x		x			
		Incurrence/redemption of liabilities (+/−)	K81	K81=K61		x		x		x		x		x		x		
		Incurrence/remission of liabilities (ROW) (+/−)	K91	K91=K71														x
		Current transfers associated with redeption of liabilities (+/−)	K82	K82=C81		x		x		x		x		x		x		
		Current transfers associated with remission of liabilities (ROW) (+/−)	K92	K92=C91														x
Other diminution in volume of assets account																		
	Inventories (−)		M21	M21=−D21−F21	x				x		x		z		x			
	Fixed assets (removals) (−)		M31	M31=−D31−F31	x		x		x		x		x		x			
	Fixed assets (other changes) (−)		M32	M32=−D32−F32	x		x		x		x		x		x		x	
	Valuables (−)		M41	M41=−D41−F41	x		x		x		x		x		x		x	
	Non-produced assets (−)		M51	M51=−D51−F51	x		x		x		x		x		x		x	
	Financial assets (−)		M61	M61=−D61−F61	x		x		x		x		x		x		x	
	External financial assets (−)		M71	M71=−D71−F71	x		x		x		x		x		x			
		Liabilities (−)	M81	M81=−D81−F81		x		x		x		x		x		x		
		Liabilities (ROW) (−)	M91	M91=−D91−F91														x
		Net worth	MZ			x		x		x		x		x		x		
		Net external assets	MY															x
Revaluation account																		
	Inventories (+/−)		P21		x				x		x		z		x			
	Fixed assets (+/−)		P31		x		x		x		x		x		x			
	Valuables (+/−)		P41		x		x		x		x		x		x			
	Non-produced assets (+/−)		P51		x		x		x		x		x		x			
	Financial assets (+/−)		P61		x		x		x		x		x		x		x	
	External financial assets (+/−)		P71		x		x		x		x		x		x			
		Liabilities (+/−)	P81			x		x		x		x		x		x		
		Liabilities (ROW) (+/−)	P91															x
		Net worth	PZ			x		x		x		x		x		x		
		Net external assets	PY															x
Closing balance sheet (at currentmarket value)																		
	Inventories		Q21	Q21=O21+I21+M21+P21	x				x		x		z		x			
	Fixed assets		Q31	Q31=O31+I31+J31+J32+M31+M32+P31	x		x		x		x		x		x			
	Valuables		Q41	Q41=O41+I41+J41+J42+M41+P41	x		x		x		x		x		x			
	Non-produced assets		Q51	Q51=O51+J51+J52+M51+P51	x		x		x		x		x		x			
	Financial assets		Q61	Q61=O61+J61+J62+K61+M61+P61	x		x		x		x		x		x		x	
	External financial assets		Q71	Q71=O71+J71+J72+K71+M71+P71	x		x		x		x		x		x			
		Liabilities	Q81	Q81=O81+J81+J82+K81+K82+M81+P81		x		x		x		x		x		x		
		Liabilities (ROW)	Q91	Q91=O91+K91+K92+M91+P91														x
		Net worth	QZ			x		x		x		x		x		x		
		Net external assets	QY															x

Corresponding Paragraphs

ReFiNA	SNA2008	ESA1995	BPM6
3.1		8.1, 8.2	
3.2		8.4	
3.3		8.9	
3.4	1.52, 6.24, 14.4	8.10	
3.5	6.8, 6.80, 6.81		
3.6	7.88, 7.90		
3.7	7.98		
3.8			
a			
b	8.117		
c		3.147	
d			
e		3.102	
3.9	15.142		
a			
b	8.117		
c			
d			
e			
f	8.16–8.18		
g	8.19		
3.10	7.15	8.21	
3.11	19.19, 19.25	4.02	
3.12		8.30	
3.13	2.103, 2.106	8.38	
3.14	1.20, 1.21		
3.15	2.4, 10.1		
a	10.12, 10.118		
b	1.52		
c			
3.16	10.9		
3.17			
3.18		4.164	
3.19	11.1		
3.20			
3.21			2.18, 2.31
3.22			
3.23	13.8		
3.24	12.5, 12.45, 12.46	6.24	
3.25	12.73, 12.80		