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From balance of payments and international investment position to the rest of the world account: roadmap to Bank of Portugal's experience¹

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¹ This paper was prepared for the meeting. The views expressed are those of the authors and do not necessarily reflect the views of the BIS, the IFC or the central banks and other institutions represented at the meeting.

From Balance of Payments and International Investment Position to the Rest of the World account: Roadmap to Banco de Portugal's experience ¹

"The road to success is always under construction"²

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In Portugal, external statistics (Balance of Payments/International Investment Position – BoP/IIP) and financial accounts are a responsibility of *Banco de Portugal*. The non-financial accounts are compiled by *INE-Portugal*.

The methodological manuals suggest a high degree of consistency and harmonization between the BoP/IIP statistics and the Rest of the World (RoW) account. *Banco de Portugal's* compilation process of BoP/IIP and RoW account statistics was improved in 2014 to reinforce its consistency, achieving higher statistical quality standards, increasing the comparability between the two domains and obtaining a more efficient compilation process. One example is the internalization of quarterly analysis of the RoW financial account into a monthly BoP/IIP process, implying changes in procedures and IT developments.

There is also a strong link between the BoP and the national sector accounts given that net lending/ borrowing of the economy is obtained through the balancing item of the current and capital accounts.

Keywords: Balance of payments, International investment position, Financial Accounts, Rest of the world sectoral account

JEL classification: C80

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Disclaimer: The views expressed in this paper are those of the authors and do not reflect those of Banco de Portugal.

² Citation from Arnold Palmer, American athlete.

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1. Balance of Payments and International Investment Position compilation

1.1 Basic concepts and methodological framework

The methodological standards that guide the compilation of BoP/IIP are set out in the sixth edition of the Balance of Payments and International Investment Position Manual (BPM6).

BoP/IIP statistics aim to grasp the economic relationships between residents and non-residents of a given economy. The full set of external accounts comprise both the operations related to financial assets and liabilities, known as the financial account and also those operations involving the non-financial assets, portraying the so-called real economy, recorded in the current and capital account.

BoP/IIP high quality statistics are a crucial set of information for determining the net lending/borrowing of a given national economy. The principles and methodology underlying the BoP/IIP are consistent with those of national accounts, compiled accordingly to SNA2008³ or ESA2010⁴. The variety and dimensions that are reflected in BoP/IIP are enormous aggregating flows/stocks that are reflected in the different institutional sectors of a given economy. Moreover, BoP/IIP are based on several data sources and similarly to national accounts, the non-financial and financial part should be balanced. This task is, in practice, rather demanding taking into account that BoP/IIP statistics, in the case of Portugal, are compiled on a monthly basis.

1.1.1 The current and capital account

The structure of the current and capital account shows links with the sequence of accounts of national accounts. The current account has flows of goods, services, primary income, and secondary income between residents and nonresidents (BPM6, §2.14). The capital account shows credit and debit entries for nonproduced nonfinancial assets and capital transfers between residents and nonresidents (BPM6, §2.16). BoP is compiled from the perspective of the resident sectors. As an example, if the sector of non-financial corporations is exporting goods and services, the corresponding amount will be recorded as a credit in BoP (an example is shown below).

Goods and services are recorded when there is a change of economic ownership from a unit in one economy to a unit in another country (ESA2010, §18.26). In BoP the current and capital account reflect the export and imports of goods and services, regardless of its final use, whereas in national accounts this information is recorded either as intermediate consumption or gross fixed capital formation. Therefore, the entries in the capital account only cover acquisitions and disposals of non-produced non-financial assets and capital transfers. Land acquisitions and disposals are not included (ESA2010, §18.55). On the other hand, in relation to current and capital transfers the links are more straightforward.

³ System of National Accounts 2008

⁴ European System of National and Regional Accounts 2010

BoP statistics provide a useful insight to some items regarding households. As an example, remittances, which are recorded in the current account as current transfers can have, in countries like Portugal, a significant weight. Current transfers encompass also the lottery prizes which are received by households whenever those are organized at the European level. BoP is also a useful instrument for analysing the impact in the economy of a given phenomenon. This is the case of the European Union Funds, which are recorded via BoP. The related amounts are recorded in the current account if they are received as subsidies by the national producers, which are mostly on the non-financial corporations sector. The most common example are the agricultural subsidies. The European Funds can also be recorded in the capital account whenever those funds are devoted to finance gross fixed capital formation. The balance of the current and capital account will imply an increase/decrease in net foreign assets, e.g. the financial account balance. As an example, a deficit on the current and capital accounts implies that it is financed by either the disposal of foreign assets or the increase of liabilities to nonresidents.

1.1.2 The financial account

The financial account has two key pieces: BoP and IIP. According to its definition in BPM6 (§ 2.8), the IIP is a “a statistical statement that shows at a point in time the value of: financial assets of residents of an economy that are claims on nonresidents or are gold bullion held as reserve assets; and the liabilities of residents of an economy to nonresidents”. Its net position, obtained from the difference between assets and liabilities, can either represent a net claim (if positive) or a net liability (if negative) from an economy to the rest of the world. This net position is a balancing item known as net worth.

In figure 1, there is an illustration of the schema for the compilation of the international financial accounts between two consecutive periods, t and t+1.

BoP_{t+1} represents the flows that reflect only economic transactions, while OC_{t+1} comprises other changes in financial assets and liabilities not related to transactions, such as holding gains and losses, arising from changes in their prices and/or the exchange rates and other changes in the volume of assets and liabilities (BPM6, §3.20). Together BoP_{t+1} and OC_{t+1} summarize the flows between residents and non-residents that explain the changes in the IIP from t to t+1. These flows are recorded in net terms, separately for financial assets and liabilities.

The balancing item which results from netting BoP’s net acquisition of financial assets and net incurrence of liabilities is called net lending (if positive) or net borrowing (if negative), representing either a surplus or a deficit of the economy regarding the rest of the world.

Conceptually, in BoP the balancing item of the non-financial account’s side, the sum of the current and capital accounts, and of the financial account should be equal, but

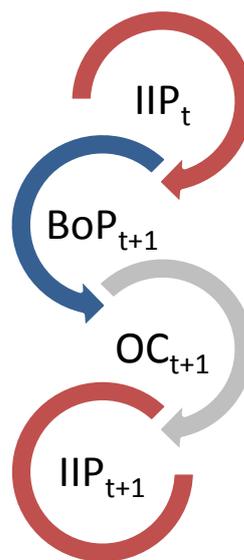


Figure 1 – Compilation schema of BOP/IIP

imbalances between these two items do exist, usually due to discrepancies in source data. This imbalance is known as 'errors and omissions'. The following equality can be expressed:

$$\text{Sum of the current and capital account} = \text{Net financial external accounts} + \text{Errors \& Omissions}$$

In the financial account, BOP/IIP items are primarily grouped by functional categories, which aim to reflect the economic motivation of cross border transactions and positions. These functional categories are: direct investment, portfolio investment, reserve assets, other investment and financial derivatives and employee stock options. At a second level of classification, BPM6 uses three broad categories for financial assets and liabilities: Equity and investment fund shares; debt instruments other financial assets and liabilities.

2. From BOP/IIP to the Rest of the World account

2.1 Methodological framework of National Accounts

In the latest publication of these manuals and also of BPM6, there was a clear effort of convergence, enabling more consistency between both statistical domains.

Although convergent, complementary approaches still remain. For example in the financial account, while BOP/IIP operations are primarily recorded by functional categories as already mentioned, in NA the record is done by type of instrument, giving priority to the classification based upon the legal characteristics of the relationship between the parties involved in a certain operation rather than its economic motivation. Through the bridging between BPM6's financial assets and liabilities broad categories and SNA2008/ESA2010 financial instrument type, a correspondence between the two statistical outputs can be achieved, as can be observed in figure 2.

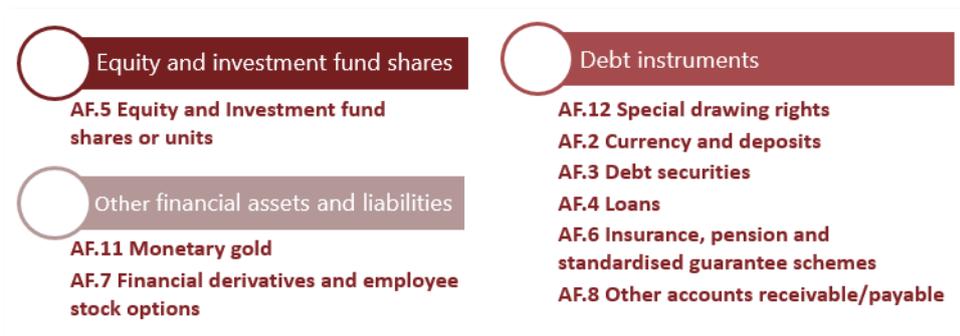


Figure 2 – Bridging financial instrument classification between BPM6 and SNA2008/ESA2010

In addition, these two statistical domains allow for a complementary analysis. While BoP/IIP is compiled from the standpoint of the resident sectors, in the RoW account in NA the external operations are recorded from the perspective of non-residents and portrayed like an institutional sector: Rest of the World (RoW). According to the

definition in ESA2010 (§2.131) the RoW sector “is a grouping of units without any characteristic functions and resources; it consists of non-resident units insofar as they are engaged in transactions with resident institutional units, or have other economic links with resident units”.

The recording perspective in NA results in the following dynamics: a resource or a claim for RoW is a use or a liability for total economy and vice versa. Consequently, balancing items are symmetric. The recording of monetary gold (gold held monetary authorities as reserve asset) is an exception since it is registered as a financial asset for the holding sector but has no counterpart liability, which conveys into a methodological difference between BoP and RoW account.

In Portugal, the compilation of National Accounts is a responsibility shared between Banco de Portugal and INE - Portugal. The first is responsible for the compilation of the financial account and the latter for the non-financial account.

From this point on, the focus will be on the compilation of the financial account of BoP/IIP and NA, showing some of the procedures currently in practice.

2.2 Compilation procedures of the National Financial Accounts in Portugal

National Financial Accounts (NFA) have a dedicated unit within the statistics department, but for the compilation Banco de Portugal developed a multidisciplinary team with experts from financial accounts and from the different underlying primary statistics. All team members are co-responsible for producing NFA, for example, the input for the RoW account is a responsibility of the BoP/IIP experts.

In terms of the compilation procedures, the several units give the inputs for their sector account. Then, through a pre-established hierarchy of sources, inputs from some sectors have a prevalence over the others. RoW has hierarchy of source upon most of its counterparts, with the following exceptions: the sectors investment funds other than monetary market funds; pension funds and for the insurance corporations data on the instruments within AF.6 category (SNA2008/ESA2010) related with insurance and standardised guarantee schemes, since the information from these specific sectors/instruments was regarded as having better quality/coverage. For example, much of the information provided to BoP/IIP for pension funds is made by the entities managing the funds, which sometimes makes it difficult to distinguish between operations of the manager itself or of the funds.

The balancing item net lending/borrowing used by NFA for the total economy is given by the current and capital accounts' balancing item. As already mentioned, the different perspective in the compilation of BOP and NFA leads to this symmetry. Therefore the following equalities can be expressed:

$$\begin{aligned} \text{Net lending/net borrowing of RoW} &= - (\text{Net lending/net borrowing of total economy}) \\ &= - (\text{Sum of the current and capital account}) \\ &= - (\text{Net financial external accounts} + \text{Errors \& Omissions}) \end{aligned}$$

Another balancing item also used in NFA is net worth, for which the following expression is used:

$$\text{Net worth of RoW} = - (\text{International Investment Position} - \text{Monetary gold position})$$

The monetary gold position is subtracted from IIP, given that it is not a liability for RoW in the NFA compilation.

Another methodological difference regards the instrument 'Financial derivatives' (AF.7 in SNA2008/ESA2010) which is recorded on gross basis in the IIP and on net basis in the NFA. When considering the net output, this does not originate any discrepancy between both statistics.

2.2.1 From BoP/IIP to RoW – an example

To illustrate some of the correspondences mentioned along the paper, let's consider an NFC resident in Portugal and the recording of its external operations.

Figure 3 shows the NFC current and capital account for t+1. This NFC imports its goods to manufacture the final product and exports part of its production. A property income is paid related to securities issued and held by foreign investors. The sum of the current and capital account flows result in a net borrowing balance of -3 monetary units (m.u.).

Flows t+1	
Credit	2.7
Exports of goods	2.7
Debit	5.7
Imports of goods	5.4
Property income	0.3
Net (C-D)	-3

Figure 3 – Current and capital account flows for t+1

This NFC is controlled by a non-resident entity and the operations between them are recorded in the direct investment functional category. During t+1, the NFC issued securities that were also of the interest of portfolio investors, reflected on the liabilities side. On the assets side, the investment in securities issued outside the monetary union is recorded on the assets side on the portfolio investment category. Also on the assets side the NFC's deposits on banks outside Portugal are recorded under the other investment category. Figure 4 displays the NFC's IIP for t and t+1 and also the summarized flows that occurred during period t+1. The IIP is represented by the stock columns in t and t+1. The financial transactions, other price changes, exchange rates changes and other volume changes are respectively recorded in the columns 'Trans t+1', 'OPC t+1', 'ERC t+1' and 'OC t+1'.

	Stock t	Trans t+1	OPC t+1	ERC t+1	OC t+1	Stock t+1
Assets	195	10	5	-2	0	208
Direct investment	35	-10	0	0	0	25
Debt instruments	35	-10	0	0	0	25
Portfolio investment	150	20	5	-2	0	173
Debt instruments	150	20	5	-2	0	173
Other investment	10	0	0	0	0	10
Debt instruments	10	0	0	0	0	10
Liabilities	77	13	2	0	0	92
Direct investment	77	3	2	0	0	82
Equity	70	0	2	0	0	72
Debt instruments	7	3	0	0	0	10
Portfolio investment	0	10	0	0	0	10
Debt instruments	0	10	0	0	0	10
Net (A-L)	118	-3	3	-2	0	116

Figure 4 – IIP and financial flows between t and t+1

During the period t+1, the balance of payments' financial net transactions is of -3 m.u., presenting the same net borrowing result as of the current and capital account as desired.

Figure 5 shows the same information as figure 4, but with SNA 2008/ESA2010's instrument classification. Functional categories are dismissed and items grouped by financial instrument type.

	Stock t	Trans t+1	OPC t+1	ERC t+1	OC t+1	Stock t+1
Assets	195	10	5	-2	0	208
F22	10	0	0	0	0	10
F32	185	10	5	-2	0	198
Liabilities	77	13	2	0	0	92
F32	0	10	0	0	0	10
F41	7	3	0	0	0	10
F512	70	0	2	0	0	72
Net (A-L)	118	-3	3	-2	0	116

Figure 5 - IIP and financial flows: bridging from BPM6 to SNA2008/ESA2010 instrument classification

Figure 6 shows the transition from BoP/IIP's perspective to RoW's perspective.

	Stock t	Trans t+1	PC t+1	OC t+1	Stock t+1
Assets	77	13	2	0	92
F32	0	10	0	0	10
F41	7	3	0	0	10
F512	70	0	2	0	72
Liabilities	195	10	3	0	208
F22	10	0	0	0	10
F32	185	10	3	0	198
Net worth/Net lending	-118	3	-1	0	-116

Figure 6 – From BoP/IIP do RoW

Assets and liabilities change their places and balancing items have now symmetrical values. The columns of OPCt+1 and ERCt+1 in figure 5 are now merged in the PCt+1 column in figure 6, summarizing the prices changes.

3. Mitigating differences between BOP/IIP and RoW

Given the described compilation procedure, differences between BOP/IIP and RoW, other than methodological, can emerge for one of two reasons: either by discrepant counterpart information with hierarchy of source or by different vintages of information.

As mentioned earlier, BoP/IIP data through RoW's sectoral account has hierarchy of source over most of its counterparts in the compilation of the NFA, which only adds increased responsibility to the quality of information. The compilation timeliness of BoP/IIP stressed the need of enhancement of the quality procedures to avoid corrections introduced to RoW's account data, which ultimately lead to vintage differences.

To better understand the quality procedures implemented, we shall look at the compilation process of BoP/IIP in *Banco de Portugal*.

3.1. BOP/IIP's compilation system



Figure 7 - Compilation system schema

The process begins with data acquisition and its validation. For the compilation of BOP/IIP several sources of information are used, but they can be condensed in five types:

- direct report of external operations - entities which conduct cross border operations, from a defined threshold, must classify and report such operations to *Banco de Portugal*;
- settlements data from banks – a very valuable piece of information to help validate the direct report and to detect new entities involved in operations with non-resident entities. This information is reported on an entity by entity basis and by type of flow (inward or outward) or position by the end of the period
- external data from other entities and organizations - emphasis to information from *INE-Portugal* and on a supra-national level Centralised Securities Database⁵ and Coordinated Portfolio Investment Survey⁶;
- internal data from Banco de Portugal- statistical outputs such as SSIS, the securities statistics integrated system with information on residents' holdings investor by investor, security by security (s-b-s) and residents' issuances s-b-

⁵ Information from the European Central Bank

⁶ Information from International Monetary Fund

s, and monetary financial statistics and investment funds. As a curiosity, this latter source of information was integrated after realizing through NA hierarchy of sources that for RoW's holdings of investment fund shares/units, this was a more accurate source than SSIS. Internal but non-statistical, such as accounting data for the central bank sector and Target settlements;

- specific surveys of BoP/IIP division – to fill as in the case of financial derivatives.

All these different data sources are analyzed and then incorporated, initiating the compilation process. The statistical information is processed using SAS, which insofar has proven to efficiently deliver to the compilers autonomy and flexibility to adapt to new sources/procedures when needed. Later, when the compilation process is finished, we start the data analysis, which is generally done through excel files, with pivot tables connected to SAS tables in the database. If needed, corrections are made and in part the compilation is reprocessed. Afterwards, outputs are disseminated to several users: internal, within Banco de Portugal, external national and supra-national entities and also to the public in general.

3.2 Improvements in the BoP/IIP compilation system envisaging to mitigate differences

The update of the methodological manual to BPM6 presented itself as an opportunity to redesign BOP/IIP's compilation system from its core. One of the changes that had a direct impact on RoW's compilation was the data warehouse framework.

Figure 8 shows both the old and the current structure of the data warehouse. In the old structure, the BOP/IIP data base was only in its own terminology, as so to give the inputs for the RoW account the information had to be 'translated' outside the data base. Additional inputs with information not directly available on the database had to be prepared separately. In the current structure the database supports both terminologies, enabling a direct extraction of data for RoW's account.

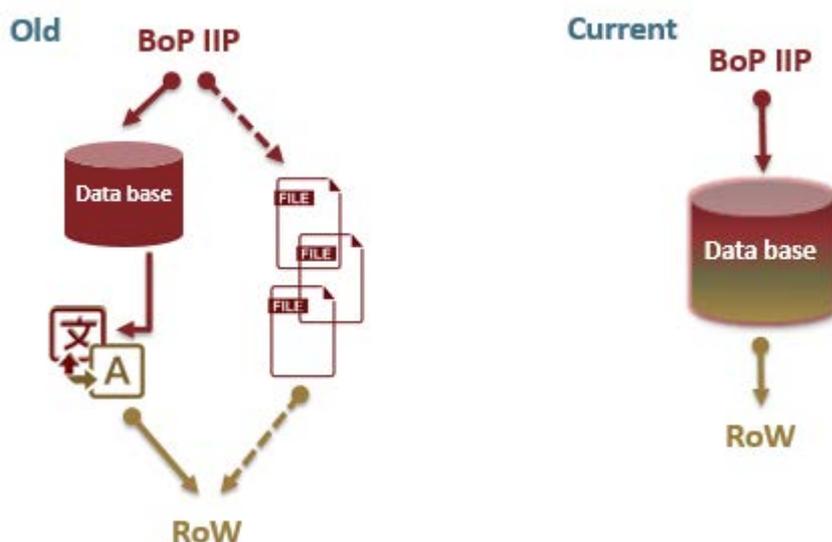


Figure 8 – Data warehouse structure

The combination of an enriched database with a flexible compilation system, allowed for several additional analysis. One of those analysis, which was even included within

the compilation procedure, was the monthly comparison of the securities' whom-to-whom transactions. This comparison is made between BOP and SSIS's statistical outputs: RoW's holdings by resident issuer sector and RoW's issuances by resident investor sector (respectively, blue highlighted row and column in figure 9). In terms of instrument, it is broken down by short and long-term debt securities, listed shares (only for RoW's holdings) and investment fund shares/units. This procedure is also made monthly for transactions.

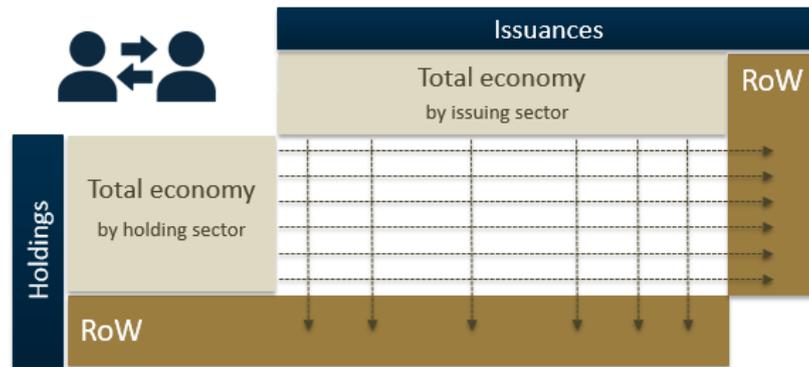


Figure 9 - Securities' whom-to-whom

This allows to detect divergences between both statistical outputs, which trigger an investigation of its origin. If needed, corrections are still included in the course of BoP/IIP's production. As a result of this process, there was a clear quality improvement in both statistical domains.

Another procedure only made possible by the current data base structure is the monthly analysis of the IIP and all the financial flows through the perspective of RoW account. It allows an early identification of possible outliers, for example examining if a price change vis-à-vis resident sector in a certain instrument is plausible given its stock. As mentioned by Mink, R. et al (2012), a "set of accounts that show by sector and type of financial instrument the transactions, other economic flows, and the positions of financial assets and liabilities vis-à-vis the counterpart sector, whether resident or cross-border, reflect more accurately the reality of the interconnected global economy".

All these procedures are tools to mitigate vintage differences between BoP/IIP and RoW. Operations are recorded in BoP/IIP with the best information available, but often additional time and information from other statistical domains brings clairvoyance to its full extent. A check of media news and press releases from official entities is regularly made. When a complex operation is identified, meetings are promoted with colleagues from other statistical domains concerning such operations, aiming to achieve higher consistency and accuracy upon its recording.

4. Final considerations

Banco de Portugal improved its BoP/IIP compilation system for the implementation of BPM6. Since then it became possible to analyze data through both BoP/IIP and RoW's account perspective and in doing so compilers became more aware of how their data affect other statistics. When the focus goes beyond the production that

each compiler is carrying, there is shift in the mindset that supports a more integrated and cooperative approach to the statistical compilation as a whole.

Even if the navigation is not as straight forward as one may initially predict, the roadmap is definitely clear about the destination, which all in all is the consistency and quality improvement of statistical outputs.

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- I. Introduction**
- II. Balance of Payments and International Investment Position (BoP/IIP) compilation**
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- IV. Mitigating differences between BoP/IIP and RoW**
- V. Final remarks**



International Investment Position (IIP)

Position or stock value of financial assets and liabilities of residents to non-residents at a certain moment in time

Balance of Payments (BoP)

Economic transactions between residents and non-residents during a certain period

Financial account (FA)

Transactions that involve financial assets and liabilities

Current and capital account (CCA)

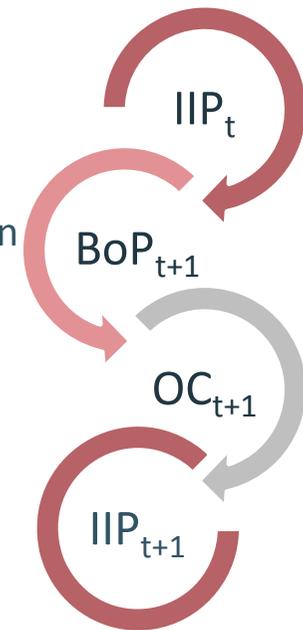
Flows of goods, services, primary and secondary income, nonproduced nonfinancial assets and capital transfers

Other changes in the financial account (OC)

Flows other than transactions (ex.: valuation changes, reclassifications)

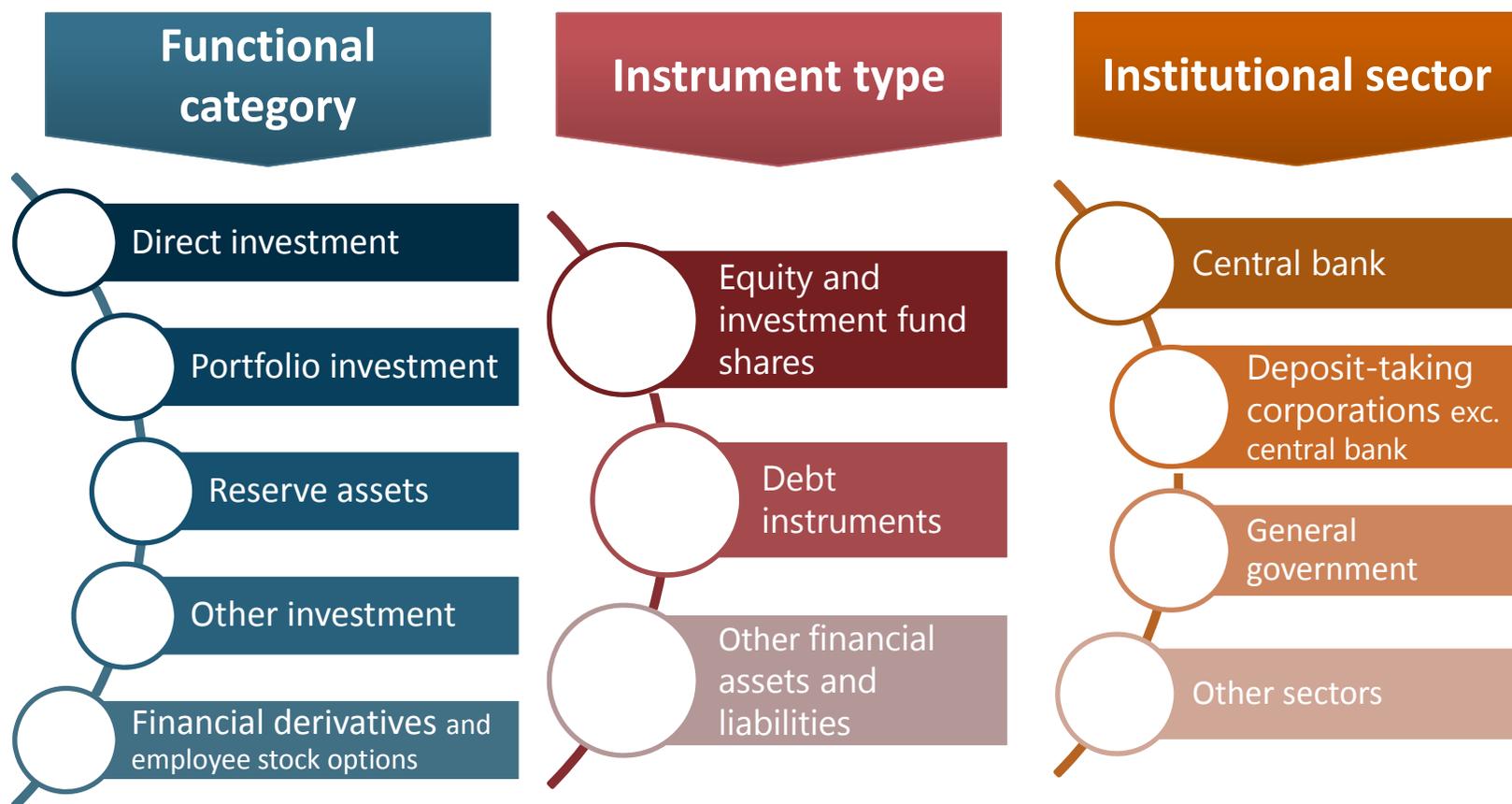
Methodological manual

BPM6 – Balance of Payments and International Investment Position Manual, sixth edition, IMF



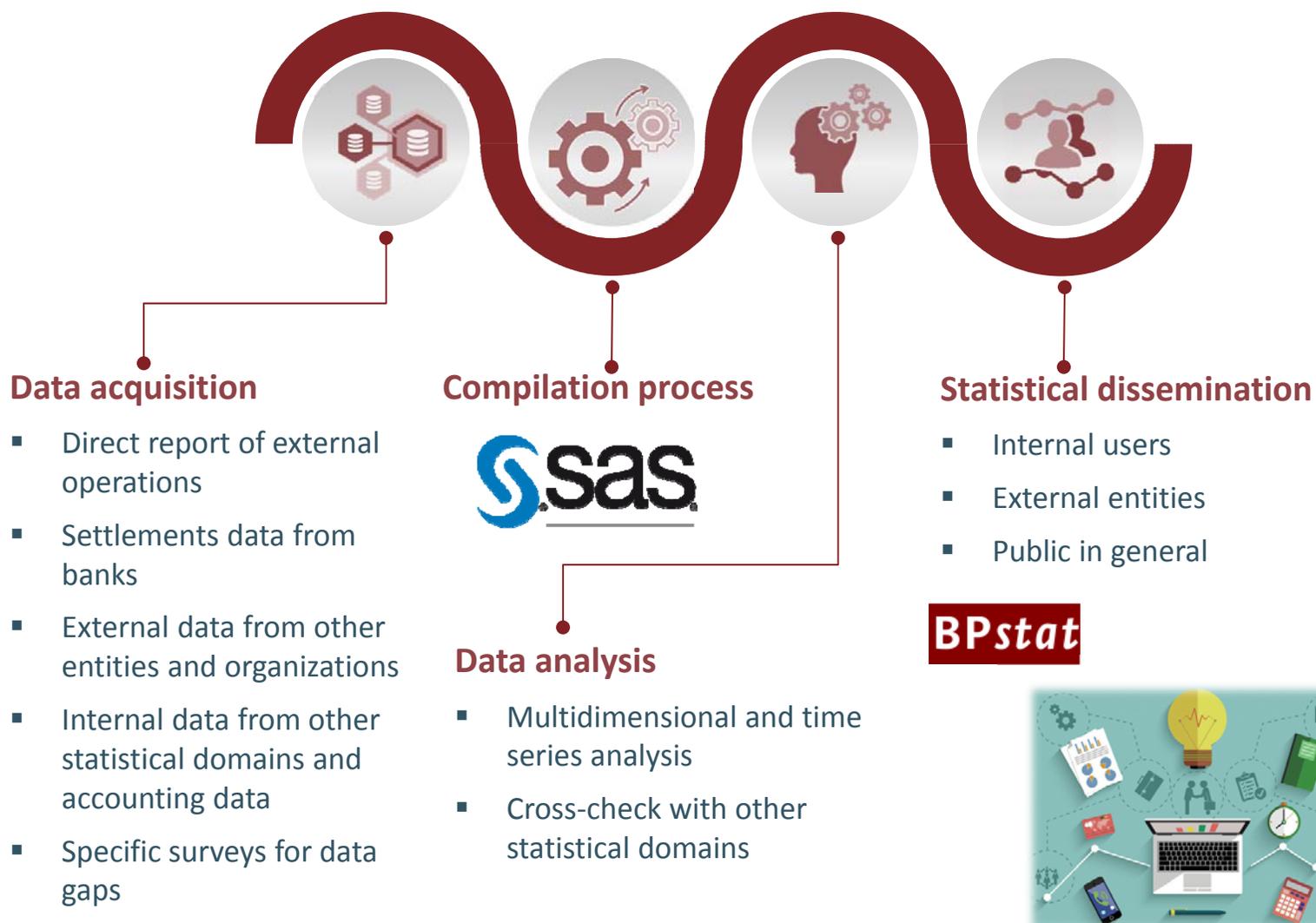


BoP FA/IIP main categories and classifications in BPM6





II. Balance of Payments and International Investment Position compilation





National accounts methodological manuals

SNA2008 (System of National Accounts)/ESA2010 (European system of accounts)

National accounts compilation in Portugal



INSTITUTO NACIONAL
DE ESTATÍSTICA
STATISTICS PORTUGAL

Non-financial account



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EUROSYSTEM

Financial account

National financial accounts

Mission structure composed by compilers of several statistical units, centrally coordinated by the unit of financial accounts





Methodological differences

IIP	RoW
Monetary gold Recorded as an asset of central bank	Monetary gold <u>Not recorded</u> as a liability vis-à-vis central bank
Financial derivatives Recorded on <u>gross</u> basis	Financial derivatives Recorded on a <u>net</u> basis

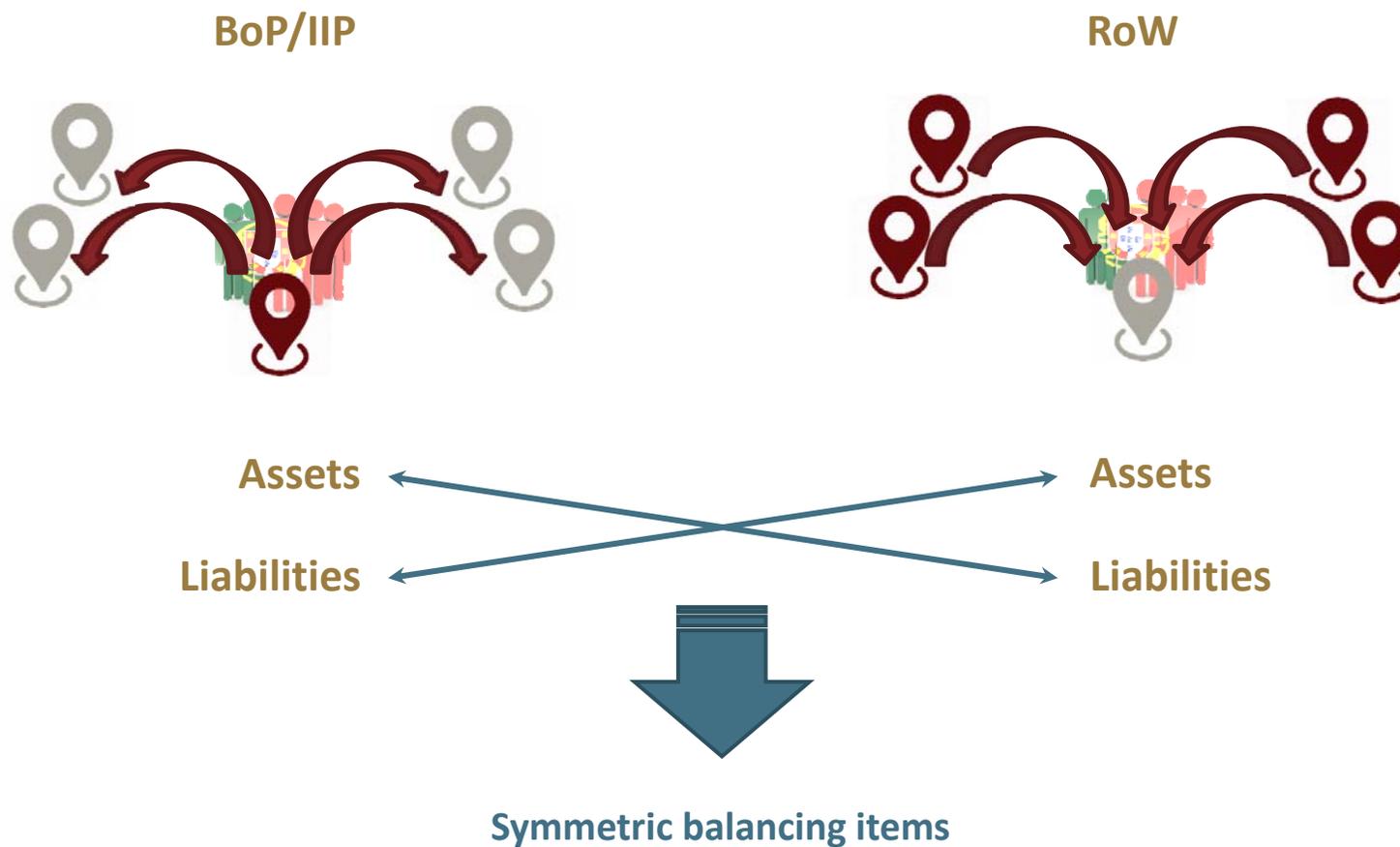
Compilation procedures

BoP/IIP has hierarchy of sources over most contributions for national financial accounts, with the following exceptions:

- The subsectors ‘**Investment funds except money market funds**’ (S124) and ‘**Pension funds**’ (S129)
- Financial instruments within F.6 category (**Insurance, pension and standardised guarantee schemes**)

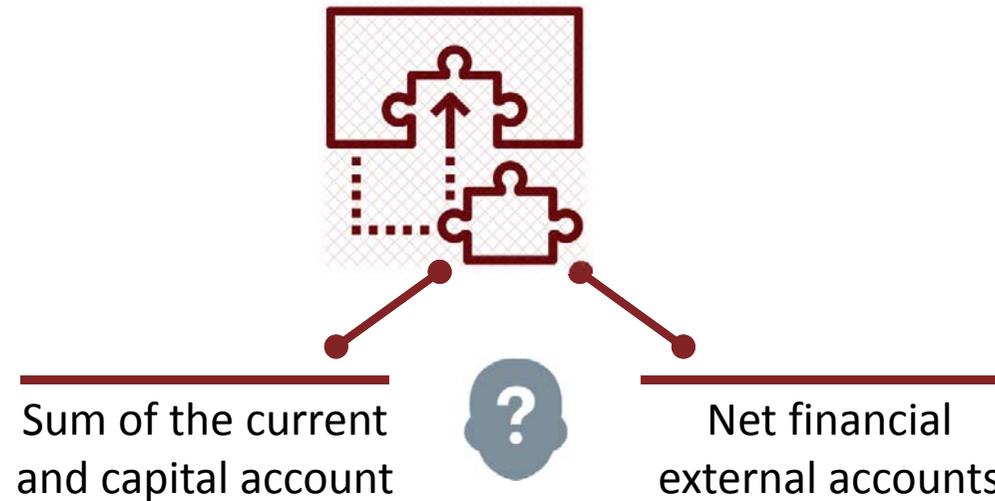


Different perspectives





Balancing items



$$\begin{aligned}\text{Net lending/net borrowing of RoW} &= - (\text{Net lending/net borrowing of total economy}) \\ &= - (\text{Sum of the current and capital account}) \\ &= - (\text{Net financial external accounts} + \text{Errors \& Omissions})\end{aligned}$$

$$\text{Net worth of RoW} = - (\text{International Investment Position} - \text{Monetary gold position})$$



BOP FA/IIP - Bridging the main items and classifications

Instrument type



Financial instrument

Equity and investment fund shares

AF.5 Equity and Investment fund shares or units

Debt instruments

AF.12 Special drawing rights
AF.2 Currency and deposits
AF.3 Debt securities
AF.4 Loans
AF.6 Insurance, pension and standardised guarantee schemes
AF.8 Other accounts receivable/payable

Other financial assets and liabilities

AF.11 Monetary gold
AF.7 Financial derivatives and employee stock options



Example (part 1) - BOP/IIP account for an NFC



	Flows t+1					
BOP CCA →	Credit		2.7			
	Exports of goods		2.7			
	Debit		5.7			
	Imports of goods		5.4			
	Property income		0.3			
	Net (C-D)		-3			
BOP FA & IIP →	Stock t	Trans t+1	OPC t+1	ERC t+1	OC t+1	Stock t+1
Assets	195	10	5	-2	0	208
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Equity	70	0	2	0	0	72
Debt instruments	7	3	0	0	0	10
Portfolio investment	0	10	0	0	0	10
Debt instruments	0	10	0	0	0	10
Net (A-L)	118	-3	3	-2	0	116



Example (part 2)

BOP FA/IIP account for an NFC – Financial instrument perspective

	Stock t	Trans t+1	OPC t+1	ERC t+1	OC t+1	Stock t+1
Assets	195	10	5	-2	0	208
F22	10	0	0	0	0	10
F32	185	10	5	-2	0	198
Liabilities	77	13	2	0	0	92
F32	0	10	0	0	0	10
F41	7	3	0	0	0	10
F512	70	0	2	0	0	72
Net (A-L)	118	-3	3	-2	0	116

RoW account perspective

	Stock t	Trans t+1	PC t+1	OC t+1	Stock t+1
Assets	77	13	2	0	92
F32	0	10	0	0	10
F41	7	3	0	0	10
F512	70	0	2	0	72
Liabilities	195	10	3	0	208
F22	10	0	0	0	10
F32	185	10	3	0	198
Net worth/Net lending	-118	3	-1	0	-116

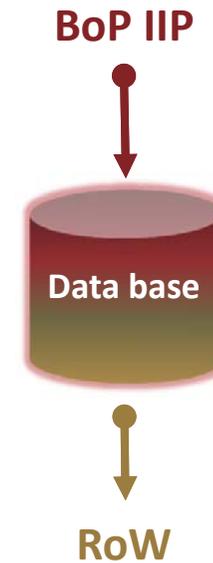
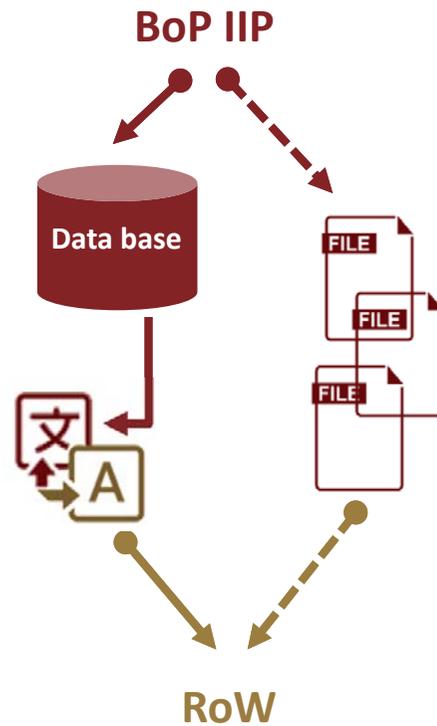
**Symmetric
balancing
items!**



Changes in the compilation of BoP/IIP



New data warehouse framework



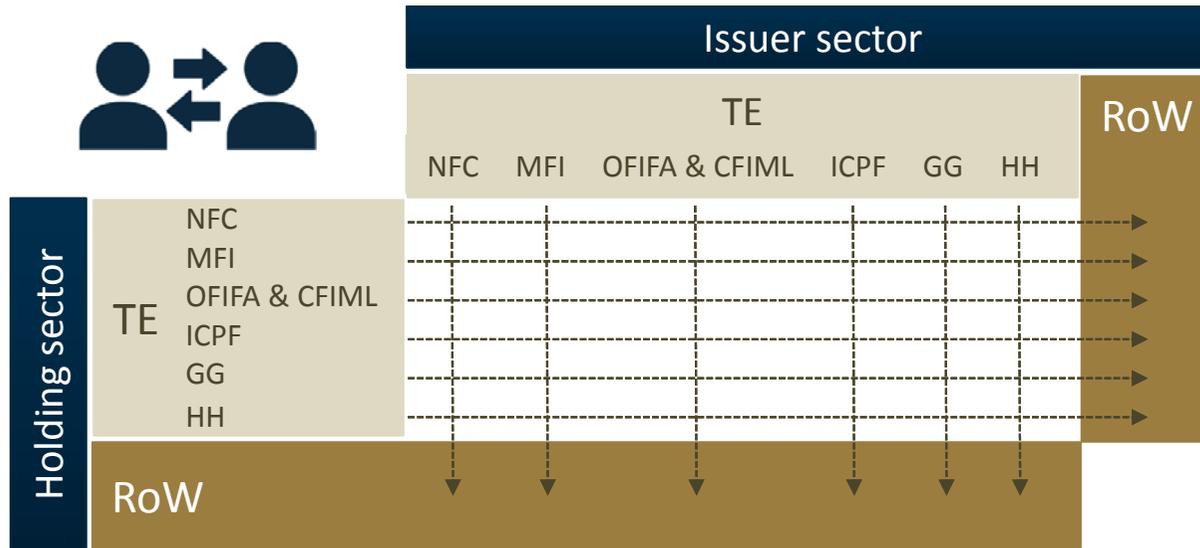


Changes in the compilation of BoP/IIP



Comparison of BoP/IIP with other statistical outputs

Ex.: Securities' whom-to-whom analysis and comparison



- ✓ Debt securities short-term long-term
- ✓ Listed shares RoW holdings
- ✓ Investment funds units



Changes in BoP/IIP procedures



Monthly analysis of BoP FA/IIP data through Row's perspective

- ✓ Early identification of possible outliers



New data sources aligned with financial accounts compilation, respecting its hierarchy of sources

- ✓ Consistency between BoP/IIP and RoW

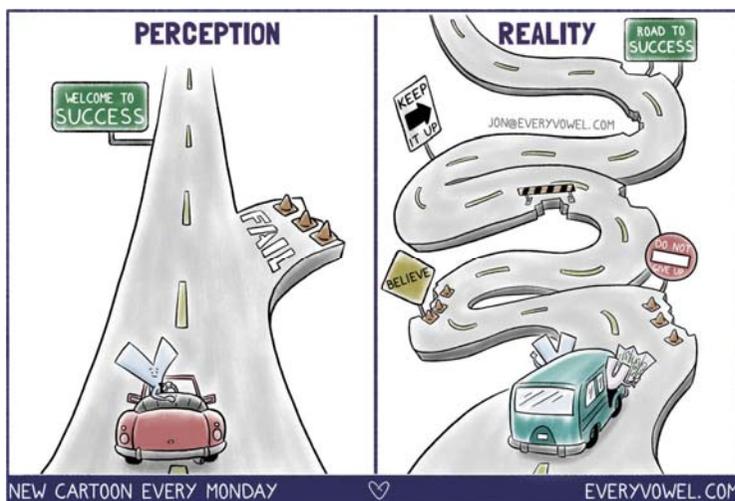
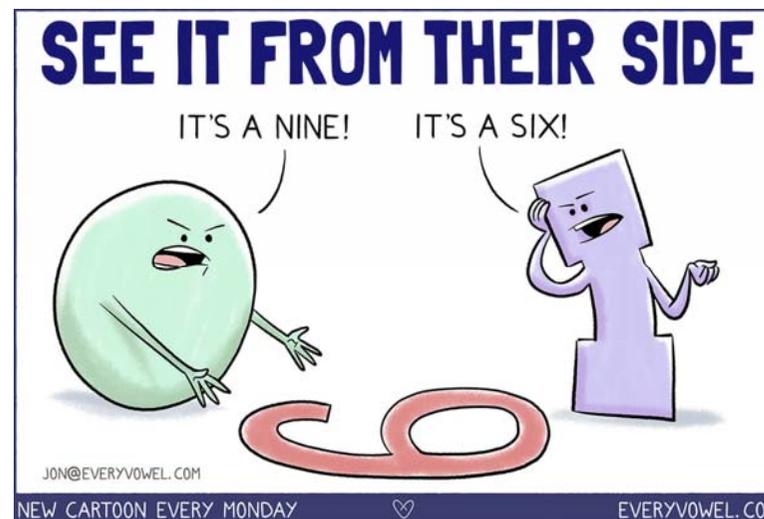


Joint analysis of complex operations

- ✓ Consistency on the recording of the operations
- ✓ Avoidance of differences due to vintages



Dual perspective over BoP/IIP data



“The road to success is always under construction”

Arnold Palmer



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Thank you for your attention!



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