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granular data modelling at the  
Croatian National Bank

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# Abstract

As the European Reporting Framework (ERF): Key facts and information<sup>1</sup> report has recognised, some countries have already implemented integrated “statistical” and supervisory reporting requirements at a granular level. Croatia is one of these countries.

Moreover, Croatia has been able to produce a local “AnaCredit” system on a loan-by-loan basis for legal entities and non-residents (see the ECB MFI list<sup>2</sup> or Annex 4 of the Banks’ Integrated Reporting Dictionary of the Croatian National Bank<sup>3</sup>), and at an aggregate level for households, other non-residents and small businesses, using the same underlying data as for statistical and prudential reporting.

A Croatian granular data system at a counterparty level for legal entities/non-residents on the list and at an aggregate level for households, other non-residents and small businesses was developed in 2007/2008 following a series of workshops held among colleagues from Supervision, Statistics and IT at the Croatian National Bank (CNB) and credit institutions.

One of the most important deliverables of the project was the CNB Banks’ Integrated Reporting Dictionary, a document in which all attributes collected by the system are listed, organised into categories, described and explained, and where examples and the methodologies used are provided. In Croatia, the CNB Banks’ Integrated Reporting Dictionary is mandatory for all credit institutions, and it has been enforced on the financial market following a decision of the Croatian National Bank Governor.

This article discusses granular data modelling for the purpose of statistical, supervisory and European Central Bank reporting and analysis.

**Keywords:** granular data, modelling, metadata, data warehouse, Croatian National Bank

**JEL Codes:** E58, C81, G28

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<sup>1</sup> [European Reporting Framework: Key facts and information.](#)

<sup>2</sup> [ECB MFI list.](#)

<sup>3</sup> [Croatian National Bank Banks’ Reporting Data Dictionary Annexes.](#)

# 1 Introduction

Historically, until 2010 the Croatian National Bank (CNB) collected data for statistical and supervisory reporting at an aggregate level by reporting agents, like many other national banks at that time. On 21 February 2003, Croatia applied for EU membership, with the official candidacy beginning on 18 June 2004. After almost 10 years of negotiations, the Republic of Croatia became the 28th EU Member State on 1 July 2013.

As the date for European Union membership was approaching, it became quite clear that the vast series of EU rules on bank supervision and statistics would be very difficult to satisfy using the old way of collecting data at an aggregate level. In 2007, colleagues from Statistics, Supervisory and IT, supported by senior management, launched a new project. The goal of the project was to design a granular system capable of satisfying every regulatory or statistical requirement, which both Croatian and international regulatory and statistical institutions may have, without issuing additional reporting requirements or placing a burden on credit institutions.

The CNB designed a granular system at a counterparty level for legal entities and non-residents (see the ECB MFI list or Annex 4 Banks' Integrated Reporting Dictionary of the Croatian National Bank), and at an aggregate level for households, other non-residents and small businesses, all of them on an instrument-by-instrument basis. One of the main deliverables of the project was the CNB Banks' Integrated Reporting Dictionary<sup>4</sup> (CNB BIRD), a document which listed all collected attributes, described in detail including code lists, as well as explanations of methodologies with examples included. In Croatia, the CNB Banks' Integrated Reporting Dictionary is mandatory on the financial market. It was enforced by a decision of the CNB Governor published in the official gazette of the Republic of Croatia known as the *Narodne novine*<sup>5</sup>. The national legislation also includes the Credit Institutions Act<sup>6</sup>. In the Republic of Croatia, a credit institution may be established as a bank, a savings bank or a housing savings bank. The credit institution sector does not include banks undergoing liquidation or bankruptcy proceedings.

The Croatian National Bank does not create balance sheets or any other reports for credit institutions. Instead, credit institutions do this themselves, but the final result they calculate from the granular data based on the Decision on supervisory reports of credit institutions<sup>7</sup> and the published metadata rules<sup>8</sup> is compared using data aggregations produced at the Croatian National Bank. At the CNB, after the credit institution sends the data, a number of the so-called horizontal and vertical controls are performed. These are described in more detail in Chapter 3. Where data does not pass the

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<sup>4</sup> [CNB Banks' Integrated Reporting Dictionary.](#)

<sup>5</sup> [Decision on statistical and supervisory reporting.](#)

<sup>6</sup> [Credit Institutions Act.](#)

<sup>7</sup> [Decision on supervisory reports of credit institutions.](#)

<sup>8</sup> Provided in Technical annexes - [supervisory reports-2.zip](#), called Tables containing rules for preparing supervisory reports, unofficial consolidated version.xlsx.

validation, an error report is sent to the credit institution for a correction to be made. Finally, two conditions have to be met: the difference between assets and liabilities should not be greater than 10 Croatian Kuna and the assets side should not differ by more than 5% compared to the previous reporting period (or this difference should be explained, e.g. due to acquisition). Reports calculated on the CNB side are sent to the credit institutions. Implicitly, if a credit institution does not make an objection, the data is considered to be correct.

Any differences found are investigated and, in the case of a dispute, the final result is considered the one calculated by the CNB. The CNB Banks' Integrated Reporting Dictionary, metadata rules for creating the aggregations, and technical instructions for building the input record (Chapter 3.4, Figure 3) are published on the Croatian National Bank website as an integral part of national legislation.

Bearing in mind the many analytical restrictions when using and analysing aggregated data, there were also many internal reasons for redesigning the system. These concern the following:

- IT flexibility – every change to the existing reporting system technically had to be done by inserting a new row simultaneously at the CNB and credit institutions
- Restrictions due to the Chart of Accounts (type of financial service or product was less important when reporting than account)
- Sector inconsistencies – due to the relationship with the Chart of Accounts, it was impossible to cover sector distribution by all types of financial instruments and therefore the advantage was often given to the sector attribute over any other attribute when reporting
- When reporting the profit and loss statement, there were issues relating to product profitability as the advantage was often given to the sector
- Counterparty profitability – the relationship between credit institution and the counterparty was mostly unknown. No insight was given into the type of financial service/product held by the counterparty, or the associated profits and costs
- Consolidation – existing reports did not have sufficient detail to create aggregations. Details were requested from credit institutions on an ad hoc basis

After a series of workshops with credit institutions, a blueprint of the new CNB Banks' Integrated Reporting Dictionary was designed and its technical implementation initiated. Finally, the formal testing period lasted throughout 2010, with the reporting system entering the production phase at the beginning of 2011. The earliest reporting date entered into the system was 30 June 2008, while data beginning in 2010 is considered to be official. During the 2010 test phase, credit institutions reported both the existing standard reporting templates and granular data records to the CNB. The CNB then used the granular data to recreate the reporting templates as a means of testing the system and proving its merits.

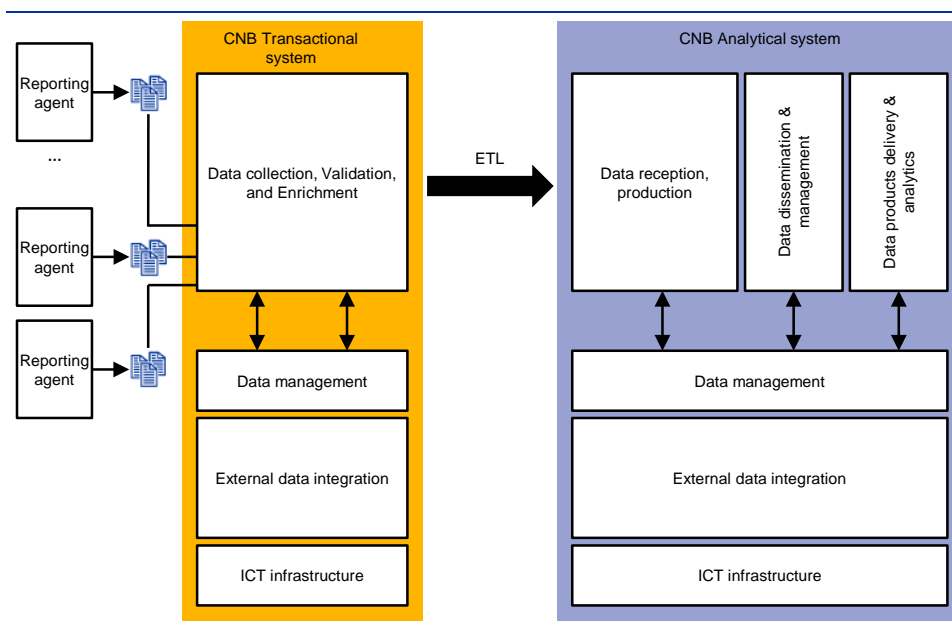
This paper describes the situation up to 30 September 2017.

## 2 Croatian National Bank reporting system design

### 2.1 A brief design overview

The input side of the CNB system is deemed to comprise: (i) data files sent to the CNB by reporting agents and (ii) the CNB's transactional database, which is the landing area for data files sent to the CNB by reporting agents, i.e. the CNB transactional system. The CNB transactional database, supporting entity relationship diagrams (ERD) and the basic components of the ERD (entities, properties of entities known as attributes, and the relationships between entities) are not covered in this article. It is important to mention that some of the examples in this article are simplified for reasons of clarity and ease of understanding and may not reflect the complexity of the whole system. The main focus of this article is metadata modelling in the CNB's analytical system, i.e. enterprise data warehouse. The high level system architecture is presented in Figure 1.

**Figure 1**  
CNB high level system architecture overview



The basic design idea was very simple: to design a record-based system having an amount described by the attributes on the input side (Figure 1) as presented in Table 1.

**Table 1**  
Basic design idea

| Description | Amount |
|-------------|--------|
|-------------|--------|

The second design idea was also simple: a description of the amount should have been sufficient to satisfy the needs of both Supervision and Statistics. Usually Statistics was interested in analysis by sectors, while Supervision was interested in portfolio. Table 2 presents both views.

**Table 2**  
Extended design idea

| Supervision needs         | Statistics needs        |
|---------------------------|-------------------------|
| Loans held to maturity    | Households loans        |
| Loans available for sales | Business entities loans |

At the time of the system blueprint, no enterprise data warehouse was planned or designed. Instead a decision was made to unify data on the input side of the system. As Willi Brammertz and his co-authors argued, sometimes data warehouses physically integrate different sources of data but do not unify them conceptually. For example, a single concept such as notional value still might be captured by multiple fields such as “nominal value”, “current principal”, “par value” and “balance” (Brammertz et al. 2009, pp. 10-14).<sup>9</sup> Later on, when an enterprise data warehouse was implemented at the CNB in 2010, data integration became much easier thanks to the input side system design.

## 2.2 Balance sheet data record attributes

The first reporting record to be defined was the balance sheet record, the so-called AA Type of record code and its attributes. The balance sheet record is used for both statistical and supervisory purposes, although statistics and supervision defined several different balance sheets using the same underlying granular data and different aggregation rules (typically, balance sheets defined by supervision are portfolio based, while balance sheets defined by statistics are sector based, the number of hierarchy levels can be different, and the balance sheet can be defined on a gross or net basis).

The main purpose of the AA record type was to create balance sheet and off-balance sheet items. The full scale of the balance sheet record and additional data records (Chapter 2.3) is set out in Table 6.

Although the initial design idea was very simple, the final design of the AA record type consists of many attributes divided into four groups:

<sup>9</sup> Bholat, D. (2016), [Modelling metadata in central banks](#).

- Report, reporting agent and counterparty attributes
- Instrument attributes
- Attributes of the amount
- Record administration attributes

These four groups combined have 27 different attributes distributed across the groups as presented in Table 3, Table 4 and Table 5.

**Table 3**  
Report, reporting agent and counterparty attributes

| Report              |                  |                    |                             | Reporting agent |            | Counterparty |            |             |                                         |                         |                                    |
|---------------------|------------------|--------------------|-----------------------------|-----------------|------------|--------------|------------|-------------|-----------------------------------------|-------------------------|------------------------------------|
| Type of record code | Reporting period | Consolidation code | Preliminary or revised code | ID              | Tax number | ID           | Tax number | County code | Country/International organization code | Nonresident sector code | Relation with reporting agent code |
| 1                   | 2                | 3                  | 4                           | 5               | 6          | 7            | 8          | 9           | 10                                      | 11                      | 12                                 |
|                     |                  |                    |                             |                 |            |              |            |             |                                         |                         |                                    |

Report attributes:

1. Type of record code (AA = balance sheet record, any of the additional records)
2. Reporting period (end day of the period)
3. Consolidated/Non-consolidated report code
4. Preliminary report/report after external auditing code

Reporting agent attributes:

5. ID (unique number issued by the Croatian Bureau of Statistics)
6. Tax number (unique number issued by the Ministry of Finance)

Counterparty attributes:

7. ID (unique for each resident legal entity; only 2 codes for natural persons; MFI non-resident from the ECB list<sup>10</sup>; one code for other non-residents)
8. Tax number (eventually to replace the ID)
9. County code
10. Country/International organisation code (ISO 3166; Annex 2 of the BOP Vademecum<sup>11</sup> – code list provided and maintained by the CNB)

<sup>10</sup> Monetary Financial Institutions (MFIs).

<sup>11</sup> Balance of Payments Vademecum.



11. Non-resident sector code (ESA 2010<sup>12</sup>, ECB “MFI and Markets Statistics Sector Manual”<sup>13</sup>; code list and explanations provided and maintained by the CNB)
12. Relation with reporting agent code (non-related, primary related (mother-daughter), secondary related (sisters) + percentage of ownership (both ways))

**Table 4**  
Instrument attributes

| Instrument      |           |               |                        |                    |                                 |                |                    |                              |                 |                          |                       |
|-----------------|-----------|---------------|------------------------|--------------------|---------------------------------|----------------|--------------------|------------------------------|-----------------|--------------------------|-----------------------|
| Instrument code | ISIN code | Currency code | Original maturity code | Notice period code | Indexation code & currency code | Portfolio code | Marketability code | Capital characteristics code | Risk group code | Embedded derivative code | Related variable code |
| 13              | 14        | 15            | 16                     | 17                 | 18                              | 19             | 20                 | 21                           | 22              | 23                       | 24                    |

Instrument attributes:

13. Instrument code – Almost 400 codes and definitions provided. Instruments have been grouped into categories: Assets (A), Liabilities (P), Off-balance sheet items (I), Hedged Assets (B), Hedged Liabilities (C), Exposures (Z), Other information (D), Profit and loss (R). Explanations of what is expected as well as the code of each instrument are provided in the CNB BIRD
14. ISIN code (ISO standard<sup>14</sup> + CNB code list provided for specific securities without ISIN codes, shares in investment funds and specific short-term papers)
15. Currency code (ISO 4217<sup>15</sup>; code list provided and maintained by the CNB)
16. Original maturity code refers to the precisely defined lifetime of the instrument. Before the end of that period a financial instrument cannot be redeemed like most debt securities or can only be redeemed with some kind of penalty. For loans, original maturity means the period from the date of the loan disbursement to the maturity date of the obligation to repay the entire loan or maturity date of the last instalment for loans which are repayable in instalments + information on grace period, both counted in months
17. Notice period code (for deposits, notional period between the day of the deposit access request and the moment when the deposit funds are actually available, counted in months, to be filled in only before the notice period is initiated)
18. Indexation code & currency code (related to instruments nominated in one currency while payable in other (usually HRK) via a one-way or two-way currency clause)

<sup>12</sup> [European System of Accounts \(ESA\) 2010.](#)

<sup>13</sup> [Monetary Financial Institutions and Markets Statistics Manual.](#)

<sup>14</sup> [ISO ISIN.](#)

<sup>15</sup> [ISO 4217 currencies code list.](#)

19. Portfolio code (17 different codes (related to IAS and IFRS) that fit banking supervisory needs)
20. Marketability code (related to loans – codes describe different degrees of marketability: non-marketable, occasionally traded, securitised, etc.)
21. Capital characteristics code (related to subordinated debt instruments that show some characteristics of equity instruments – code list provided to fit the needs of banking supervision)
22. Risk group code (code list and explanations provided to fit the needs of banking supervision - AA, A9, B1, B2, B3, CC, 00)
23. Embedded derivative code (0-1 indicator; not related to derivatives that can be separated by contracts or that are contracted with counterparties other than the main instrument)
24. Related variable code (variable the value of which the derivative relates to (including embedded derivatives) – code list (with 11 modalities) provided by the CNB)

**Table 5**  
Type of amount and Record administration attributes

| Type of amount      | Record administration |        |
|---------------------|-----------------------|--------|
| Type of amount code | Record number         | Status |
| 25                  | 26                    | 27     |

Type of amount and Record administration attributes:

25. Type of amount codes enable the identification of all the elements that make up balance sheet stocks and its changes, as well as all other characteristic types of amounts. Modalities depend primarily on the portfolios in which instruments are sorted. A detailed CNB BIRD table is also provided which connects types of record, types of amount, particular instrument codes and portfolio classifications (Table 10)
26. Record number – unique number given to every record by the CNB
27. Status (new record, cancellation, corrected record – to be filled in by the CNB)

Lists of all attributes with a specific Croatian code are shown in Annex 4, while attributes referring to external code lists (e.g. ISO codes) are provided with a reference to the respective code list.

## 2.3 Additional data records

As one may notice, the granularity of the system is quite high in terms of data collected counterparty-by-counterparty, instrument-by-instrument. Some of the attributes defined by the CNB and credit institutions consist of almost 400 different values (instruments), which also contributes to the complexity of the system. Therefore, code lists with explanations had to be provided. Others such as Original maturity or Notice period have already been divided into categories (time buckets) on the credit institutions side. The idea was to transform and standardise the data into a form suitable for reporting. Erich Hille raised the question: “What should the central banks calculate, and what should the commercial banks calculate in the data model?”<sup>16</sup> Nowadays, at least in the author’s experience, it might be better to calculate the derived attributes on the central bank side. Otherwise, a piece of valuable information that other methodologies or standards like ACTUS<sup>17</sup> could use for stress testing or another purpose would be lost. The approaches of the CNB and the Oesterreichische National Bank (OeNB)<sup>18</sup> were slightly different. The OeNB aimed to establish a database/data warehouse model for credit institutions, while the CNB defined Input record with mandatory attributes.

At the European level, the efforts of Banca d’Italia and their PUMA2 solution for collecting granular data have also been known to the NCBs and ECB community.<sup>19</sup>

On 20-22 June 2013, a workshop on “Integrated Management of Micro-databases”<sup>20</sup> was held in Porto. The meeting was addressed by Carlos da Silva Costa, the Governor of Banco de Portugal, who noted: “...I think that the availability of information at the micro level is a key tool to understand the behaviour of both firms and private individuals. For this purpose, having a good data collection system, one that also makes use of the existing micro-databases, is a necessary condition, although not a sufficient one – in addition, we need to know how to get the most out of the available data...”

During the 8th European Central Bank Conference on Statistics (6 July 2016 in Frankfurt), Session 3 with its focus on micro data and potential benefits for the industry explored the positive effects that may arise from the availability of micro datasets both within and outside the regulatory reporting environment, also considering the role of the European and international authorities.<sup>21</sup>

As the CNB system test continued, additional reporting records were developed to cover the needs of both Statistics and Supervision. At the time of writing this article, 19 different reporting records had been implemented, as presented in Table 6.

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<sup>16</sup> Hille, E. (2013), “Recent developments in restructuring the Austrian banking reporting system”, *Journal of Banking Regulation*, Vol. 14, 3/4, pp. 269–284.

<sup>17</sup> [ACTUS](#) is a non-profit organisation with the aim of establishing a global data standard for the representation of financial instruments.

<sup>18</sup> [ERF - a possible solution to reporting challenges for banks.](#)

<sup>19</sup> [Integration: a key-word for success in central banks’ statistics.](#)

<sup>20</sup> [Deepening business intelligence within central banks’ statistical systems.](#)

<sup>21</sup> [Micro data and governance. The path for going from particular to the general.](#)

By adding additional data records, the number of instrument codes has risen to 400 different values. The instruments have been grouped into the following categories: Assets (A), Liabilities (P), Off-balance sheet items (I) , Hedged Assets (B), Hedged Liabilities (C), Exposures (Z), Other information (D), and Profit and loss (R). The explanation of what is expected and the code of each instrument are provided in the CNB BIRD. The code list has been established together with credit institutions by means of workshops. During the project and in the second phase when additional records were created, there was a large public consultation where credit institutions were able to ask questions, including those related to manipulation with instruments. Furthermore, the system was designed in such a way that Annex 7/Annex 8 of the CNB BIRD provide all permitted combinations of the most important attributes of the system: Type of record code, Instrument code, Portfolio code and Type of amount code, as well as the history of every possible combination as presented in Table 10. The permitted combinations are also used to produce input side controls. Moreover, the other system controls were designed in such a way as to minimise the possibility of errors related to the instrument and other attributes. During the project, a taskforce was established. When in doubt, credit institutions can still ask the CNB questions related to system attributes, including instruments.

**Table 6**  
Balance sheet (AA) and additional reporting records

| Type of record code | Type of record code description                                                                | Type of record ownership |
|---------------------|------------------------------------------------------------------------------------------------|--------------------------|
| AA                  | Balance sheet and off-balance sheet items                                                      | Statistics, Supervision  |
| AB                  | Changes in stocks (from AA)                                                                    | Statistics               |
| AS                  | Cumulative changes of write-downs and reservations (from AA)                                   | Supervision              |
| AP                  | Cumulative changes of write-downs and reservations (from AF and AN)                            | Supervision              |
| PO                  | Lists of groups, natural persons and related legal persons                                     | Supervision              |
| AF                  | Balance sheet items for natural person counterparties                                          | Supervision              |
| AN                  | Balance sheet items for non-resident counterparties                                            | Supervision              |
| AV                  | Exchange rate-induced credit risk, natural person residents and non-residents (from AF and AN) | Supervision              |
| AW                  | Exchange rate-induced credit risk (from AA)                                                    | Supervision              |
| AE                  | Overdue receivables                                                                            | Statistics               |
| AK                  | Opportunity of interest rate reset                                                             | Statistics               |
| AD                  | Balance sheet and off-balance sheet items remaining maturity                                   | Statistics               |
| AU                  | Investments in capital of other legal persons                                                  | Supervision              |
| AM                  | Tangible assets                                                                                | Supervision              |
| IZ                  | Providers of collateral and guarantees                                                         | Statistics               |
| OI                  | Other information                                                                              | Statistics               |
| KS                  | MFI Interest rates                                                                             | Statistics               |
| RA                  | Profit and loss accounts                                                                       | Supervision              |
| AH                  | Sold placements by placement buyers                                                            | Supervision              |

The following question could be raised: If the AA (balance sheet record) record type alone collected 25 different attributes (plus two populated internally by the CNB – Table 5, attributes number 26 and 27), how many different attributes would be collected by 19 record types? A decision has been made to harmonise all the attributes necessary for Statistics and Supervision by record type in order to be able to manage input record more easily, both technically and from a business perspective. Furthermore, the structure of the input record was set to always collect up to the maximum number of defined attributes by Type of record code. A matrix has been created to give an overview of all attributes needed by record type as presented in Table 7. Attributes that were mandatory by record type code were checked. Numeric data types are filled in with leading zeros, while those not necessary or not applicable are filled in with zeros. Due to its granularity and flexibility, the system can be extended when needed:

- by adding new record types
- by adding new attributes to the existing record types
- by adding new values to the existing attributes of any record type

**Table 7**
**CNB BIRD Annex 14 – Attributes overview by Type of record code**

| Attributes                                                                         |     | Mandatory attributes |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|------------------------------------------------------------------------------------|-----|----------------------|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| Name                                                                               | Row | AA                   | AB | AS | AP | PO | AF | AN | AV | AW | AE | AK | AD | AU | AM | IZ | OI | KS | RA | AH |
| Type of record code                                                                | 1   | AA                   | AB | AS | AP | PO | AF | AN | AV | AW | AE | AK | AD | AU | AM | IZ | OI | KS | RA | AH |
| Reporting period                                                                   | 2   | ✓                    | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  |
| Consolidation                                                                      | 3   | ✓                    | N  | N  | N  | ✓  | ✓  | ✓  | N  | N  | N  | N  | N  | ✓  | ✓  | ✓  | ✓  | N  | ✓  | N  |
| Preliminary or revised                                                             | 4   | ✓                    | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | P  | ✓  | ✓  |
| Reporting institution ID                                                           | 5   | ✓                    | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  |
| Reporting institution tax number                                                   | 6   | ✓                    | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  |
| Counterparty ID                                                                    | 7   | ✓                    | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  |
| Counterparty tax number                                                            | 8   | ✓                    | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  |
| County                                                                             | 9   | ✓                    |    |    |    | ✓  |    |    |    |    | ✓  |    |    |    |    |    |    |    |    | ✓  |
| Country/International organization                                                 | 10  | ✓                    | ✓  | ✓  | ✓  | ✓  |    |    |    | ✓  | ✓  |    | ✓  |    |    | ✓  |    | ✓  | ✓  | ✓  |
| Nonresident sector                                                                 | 11  | ✓                    | ✓  | ✓  | ✓  | ✓  |    |    |    | ✓  | ✓  | ✓  | ✓  |    |    | ✓  |    | ✓  | ✓  | ✓  |
| Relation with reporting institution                                                | 12  | ✓                    | ✓  |    |    |    | ✓  | ✓  |    |    |    |    |    |    |    |    |    |    | ✓  | ✓  |
| Instrument                                                                         | 13  | ✓                    | ✓  | ✓  | ✓  |    | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  |
| ISIN                                                                               | 14  | ✓                    |    |    |    |    | ✓  | ✓  |    |    |    |    |    | ✓  |    |    |    |    |    | ✓  |
| Currency                                                                           | 15  | ✓                    | ✓  | ✓  | ✓  |    | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  |
| Original maturity                                                                  | 16  | ✓                    | ✓  |    |    |    | ✓  | ✓  |    |    |    | ✓  | ✓  |    |    | ✓  |    | ✓  | ✓  | ✓  |
| Notice period                                                                      | 17  | ✓                    | ✓  |    |    |    | ✓  | ✓  |    |    |    |    |    |    |    |    |    |    | ✓  | ✓  |
| Indexation                                                                         | 18  | ✓                    | ✓  |    |    |    | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  |    |    |    |    |    | ✓  | ✓  |
| Portfolio                                                                          | 19  | ✓                    | ✓  | ✓  | ✓  |    | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  |
| Marketability                                                                      | 20  | ✓                    | ✓  |    |    |    | ✓  | ✓  |    |    |    |    |    |    |    |    |    |    |    | ✓  |
| Capital Characteristics                                                            | 21  | ✓                    | ✓  |    |    |    | ✓  | ✓  |    |    |    | ✓  | ✓  |    |    |    |    |    | ✓  | ✓  |
| Risk group                                                                         | 22  | ✓                    | ✓  |    |    |    | ✓  | ✓  | ✓  | ✓  |    |    |    |    |    |    |    |    | ✓  | ✓  |
| Embedded derivative                                                                | 23  | ✓                    | ✓  |    |    |    | ✓  | ✓  |    |    |    |    |    |    |    |    |    |    | ✓  | ✓  |
| Related variable                                                                   | 24  | ✓                    | ✓  |    |    |    | ✓  | ✓  |    |    |    |    |    |    |    |    |    |    | ✓  | ✓  |
| Type of amount                                                                     | 25  | ✓                    | ✓  | ✓  | ✓  |    | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  | ✓  |
| Additional counterparty identification                                             | 26  |                      |    |    | ✓  | ✓  | ✓  | ✓  | ✓  |    |    |    |    | ✓  | ✓  | ✓  |    |    |    |    |
| Identification basis                                                               | 27  |                      |    |    |    | ✓  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Time class period (remaining maturity)                                             | 28  |                      |    |    |    |    |    |    |    | ✓  | ✓  | ✓  |    |    |    |    |    |    |    |    |
| Number of days between date when instrument had been taken over and reporting date | 29  |                      |    |    |    |    |    |    |    |    |    |    |    | ✓  | ✓  |    |    |    |    | ✓  |
| Party identification (collateral or fiduciary shareholder)                         | 30  |                      |    |    |    |    |    |    |    |    |    |    |    |    |    | ✓  |    |    |    |    |
| Counterparty details                                                               | 31  |                      |    |    |    | ✓  |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
| Acquisition of securities type                                                     | 32  |                      |    |    |    |    |    |    |    |    |    |    |    | ✓  |    |    |    |    |    |    |
| Interest rate type                                                                 | 33  |                      |    |    |    |    |    |    |    |    |    | ✓  |    |    |    |    |    |    |    |    |
| Material asset using type                                                          | 34  |                      |    |    |    |    |    |    |    |    |    |    |    |    | ✓  |    |    |    |    |    |
| Loan amount class                                                                  | 35  |                      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | ✓  |    |
| Period of initial rate fixation                                                    | 36  |                      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | ✓  |    |
| Collateral                                                                         | 37  |                      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | ✓  |    |
| Nonresident NACE                                                                   | 38  |                      |    |    |    |    |    | ✓  |    |    |    |    |    |    |    |    |    |    |    |    |
| New business                                                                       | 39  |                      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | ✓  |    |
| Placement buyer                                                                    | 40  |                      |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    | ✓  |

Bearing in mind data confidentiality, different roles have been defined to safeguard statistics and supervisory data. In terms of technology, using the DWH reporting tool repository functionality, one large business area was created. This business area is used to produce dashboards. Each dashboard can have different access rights via “roles”, e.g. a role dedicated to supervision, statistics or even a combined role for both supervision and statistics. More advanced business users are also able to create their own ad hoc queries; two separate business areas have been created for statistics and supervisory data. Creating ad hoc queries also requires a special role.

Moreover, special roles are assigned to many users, basically to prevent them from seeing particular balance sheet items and instruments or counterparties. For example, a role called ‘Not\_liabilities\_AF’ prevents business users from seeing liability instruments in Balance sheet items for natural person counterparties (Table 6, AF Type of record code). Each time a business user produces a query via the dashboard or an ad hoc query, a set of additional conditions will be added to the WHERE clause of their query.

## 2.4 Measure described by attributes

In total, the CNB collects 40 different attributes<sup>22</sup> by 19 record types and only one measure at the time of writing this article. The measure could be amount, interest rate, number of employees, etc. In the system, all the business logic is pushed to attributes; none of it is left to measure. To be able to “disclose” and analyse the measure, one should examine it at least through a combination of attributes: Type of record code, Portfolio code, Type of amount code and Instrument code. These four attributes form unique combinations used to describe the measure as presented in Figure 2, starting from Type of record code (AA - balance sheet record, KS - interest rate record or RA - profit and loss record) and continuing in a clockwise direction to Instrument code.

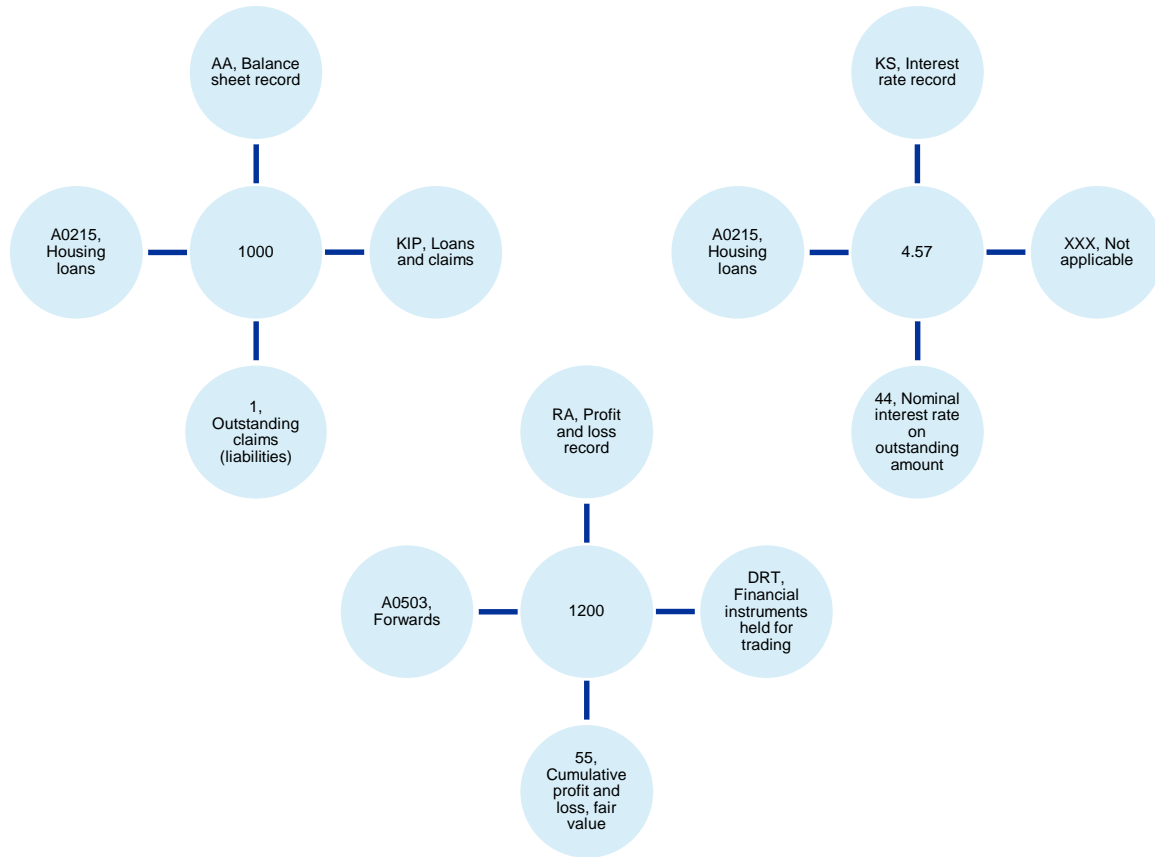
The measure 1000 is an amount, Balance sheet item, from portfolio Loans and claims, Outstanding claim (liabilities), in particular a Housing loan. The measure 4.57 is Nominal interest rate where portfolio is Not applicable, on the outstanding amount of a Housing loan. On the other hand, the measure 1200 (Profit and loss record) represents portfolio Financial instruments, held for trading, Cumulative profit and loss designated at fair value through profit or loss from trading Forwards.

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<sup>22</sup> Counterparty (PO) record type is somewhat different.

**Figure 2**

Measure described by Type of record, Portfolio, Type of amount and Instrument codes and description; clockwise direction





## 3 Banks' Integrated Reporting Dictionary defined by the Croatian National Bank

### 3.1 Introduction

The CNB verifies whether credit institutions operate in accordance with the rules and standards in place by exercising supervision. This involves collecting granular data, analysing reports and information, and monitoring credit institutions' operations on an ongoing basis. The CNB is also one of the institutions designated as a producer of official statistics of the Republic of Croatia. Therefore, in order to exercise its own tasks and ensure data quality, the CNB has produced and applied several documents:

- CNB Banks' Integrated Reporting Dictionary<sup>23</sup>
- Annexes to the CNB Banks' Integrated Reporting Dictionary<sup>24</sup>
- Technical instructions for creating the Input record and system of validation and controls on the input side<sup>25</sup>
- Published metadata rules for creating reports<sup>26</sup>

The CNB Banks' Integrated Reporting Dictionary (CNB BIRD) produced by the CNB and reporting agents consists of documentation aimed at providing a precise description of the data that must be extracted from credit institutions' internal systems in order to generate reports, and of clearly defined rules for transforming these data in order to comply with reporting rules. As already mentioned in the introduction, the use of the CNB BIRD for supervision and statistics purposes on the Croatian financial market is mandatory for reporting agents. The CNB requires data to be delivered in file format and therefore no standardised model for organising credit institutions' internal operational systems or data warehouses was defined. It was up to the reporting agents to organise and design their operational systems or data warehouses. The same also applied to the CNB.

Many CNB BIRD attributes, including particular attribute values, have already been mentioned in previous chapters. The organisation of the CNB BIRD is as follows:

- Introduction/CNB BIRD structure
- Reporting population

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<sup>23</sup> [CNB Banks' Integrated Reporting Dictionary](#).

<sup>24</sup> [CNB BIRD Annexes](#).

<sup>25</sup> [Technical instructions for creating the Input record and system of validation and controls of the input side](#).

<sup>26</sup> Provided in Technical annexes - [supervisory reports-2.zip](#), called Tables containing rules for preparing supervisory reports, unofficial consolidated version.xlsx.

- High level overview of reporting requirements
- Data delivery timelines
- Minimal standards for reporting agents
- Detailed reporting requirements
- CNB BIRD Annexes (16 Annexes)

## 3.2 Detailed reporting requirements

The most important chapter is Detailed reporting requirements. Typically, an attribute description, modalities and examples are provided. As the data had been collected in an aggregated form before the CNB BIRD was created, many modalities of particular attributes were already known. However, in order to be able to provide full-scale code lists within the CNB BIRD, credit institutions were subsequently asked to provide more details, for example what kind of loans were offered on the market. After identifying loans as a subset of instruments and consultations with reporting agents, the CNB created Instruments and many other code lists that would be sufficient to fulfil reporting requirements.

One of the attributes, indexation (related to instruments nominated in one currency while payable in other - usually HRK) will be explained in detail. Indexation is widely used on the Croatian financial market by reporting agents in order to eliminate loan related currency risk, and is also a mandatory attribute for some types of record as presented in Table 7. Furthermore, indexation is populated only for certain instruments as set out in CNB BIRD Annex 6, Instructions for populating Instrument attributes. Modalities available for sending by reporting agents are presented in Table 8, while in Table 9 some examples have been provided.

**Table 8**  
Indexation modalities

| Indexation code & currency code | Indexation code & currency code description                                                                                    |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------|
| <b>N000</b>                     | Applicable only for instruments that could have indexation, otherwise empty                                                    |
| <b>V***</b>                     | *** is currency code as defined in Annex 4, Currency code lists, applicable for all instruments with a two-way currency clause |
| <b>J***</b>                     | *** is currency code as defined in Annex 4, Currency code lists, applicable for all instruments with a one-way currency clause |

**Table 9**  
Indexation modalities examples

| Indexation code & currency code | Indexation code & currency code description                         |
|---------------------------------|---------------------------------------------------------------------|
| N000                            | Instrument with no indexation                                       |
| VEUR                            | Instrument is indexed to Euro with a two-way currency clause        |
| JCHF                            | Instrument is indexed to Swiss franc with a one-way currency clause |

Annex 7/Annex 8 of the CNB BIRD is also very useful because it provides all permitted combinations of the most important attributes of the system: Type of record code, Instrument code, Portfolio code and Type of amount code, as well as the history of every possible combination as presented in Table 10. Permitted combinations are also used to produce input side controls.

**Table 10**  
Permitted combinations: Type of record code, Instrument code, Portfolio code and Type of amount code

| Type of record code | Instrument code | Portfolio code | Type of amount code | Valid from | Valid to |
|---------------------|-----------------|----------------|---------------------|------------|----------|
| AA                  | A0203           | GOP            | 1                   | 30.06.2008 |          |
| AA                  | A0203           | GOP            | 3                   | 30.06.2008 |          |
| AA                  | A0203           | GOP            | 4                   | 30.06.2008 |          |
| AA                  | A0203           | KIP            | 1                   | 30.06.2008 |          |
| AA                  | A0203           | KIP            | 3                   | 30.06.2008 |          |
| AA                  | A0203           | KIP            | 4                   | 30.06.2008 |          |
| AA                  | A0203           | KIP            | 5                   | 31.10.2013 |          |
| AB                  | A0203           | GOP            | 13                  | 30.06.2009 |          |
| AB                  | A0203           | KIP            | 13                  | 30.06.2009 |          |

Note: Fragment of all permitted combinations.

### 3.3 Validation rules

To ensure data quality, the CNB has established a number of validation rules, the so-called horizontal and vertical controls<sup>27</sup>. Horizontal controls are executed against one particular record on the input side, while vertical controls presume that all controlled attributes by reporting date and Type of record code (Annex 4, Type of record codes and description) on the input side should be the same except for Type of amount code (Annex 4, Type of amount codes and description) and Measure.

E.g. horizontal control number 430:

**IF Indexation code = "J" or "V", then Currency code <> Indexation currency code**

<sup>27</sup> Technical instructions for creating the Input record and system of validation and controls on the input side.

checks whether the instrument is indexed to Indexation currency via a one-way or two-way currency clause (Annex 4, Indexation code & Currency codes and description), in which case currency and indexation currency should be different.

Horizontal control number 437 checks Instrument code (Annex 4, Instrument codes and description) and Original maturity (Annex 4, Original maturity codes and description):

**IF Instrument code = "A0301", then Original maturity > "012"**

and states that financial instrument code A0301 (Bonds) should have an original maturity greater than one year.

On the other hand, vertical control number 216 checks the relationship between Type of record code (Annex 4, Type of record codes and description), Embedded derivative code (Annex 4, Embedded derivative codes and description) and Type of amount code (Annex 4, Type of amount codes and description):

**IF Type of record code in ("AA", "AF", "AN") and Embedded derivative code = "0", then Type of amount code not in ("11", "12")**

If a credit institution sent a balance sheet item, balance sheet items for natural person counterparties or balance sheet items for non-resident counterparties and financial instruments do not have an embedded derivative, then type of amount should not be embedded derivative – notional value or embedded derivative – fair value.

The vertical control number 544 is more complex. It checks Instrument codes (Annex 4, Instrument codes and description), Type of record codes (Annex 4, Type of record codes and description) and Type of amount codes (Annex 4, Type of amount codes and description). For all Instrument codes (except for A0235, A0236, A0237, A0238 and A0239) delivered in the form of interest rate record (KS), if there was at least one Type of amount code (1,2,7,10,12) delivered in the balance sheet record (AA), then there should be the same combinations of attributes delivered in the interest rate record (KS) with Type of amount code 44.

### 3.4 Comparison of the Croatian National Bank BIRD and the European Central Bank BIRD initiative

Meanwhile, there is an ongoing ECB BIRD initiative which aims to foster such cooperation in the field of regulatory reporting, thus alleviating the burden of reporting for credit institutions and improving the quality of data reported to the authorities. Its contents, published on the BIRD website<sup>28</sup>, are based on a harmonised data model describing precisely which data should be extracted from the banks' internal IT systems to derive reports required by the authorities. In addition to

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<sup>28</sup> [ECB BIRD](#).

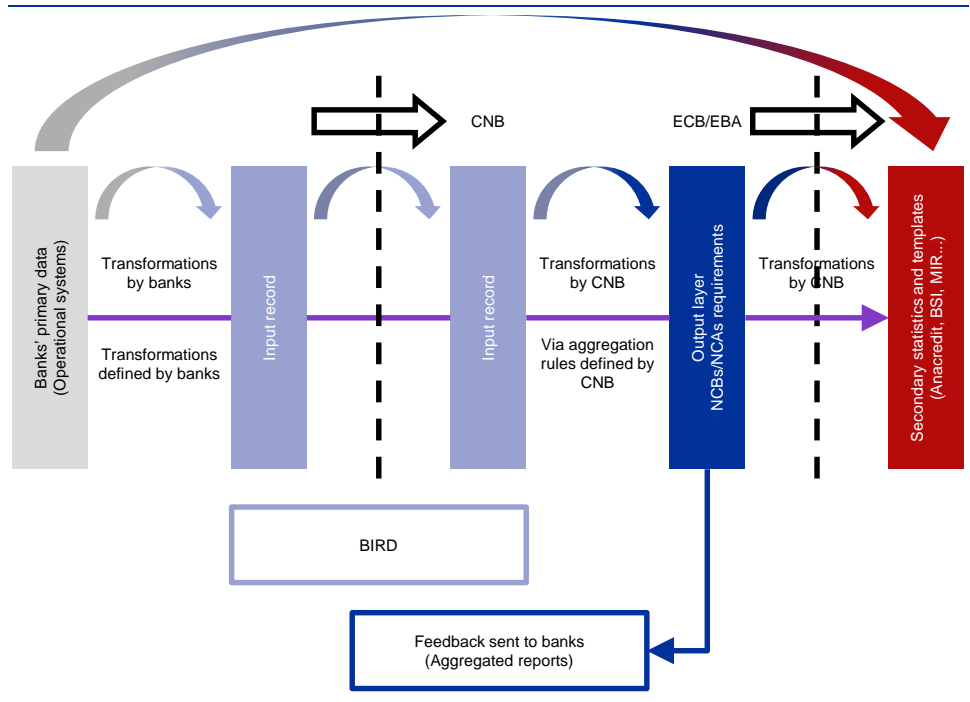
this, there are clearly defined transformation rules to be applied to the data extracted from the banks' internal IT systems in order to produce a specific final regulatory figure.

Although both CNB BIRD and ECB BIRD initiatives were aiming for the same goal, their ways of achieving it were quite different. While the ECB introduced the ECB BIRD on a voluntary basis, in Croatia the CNB BIRD is mandatory for all reporting agents, as mentioned in the introduction. No standardised data model for organising credit institutions' internal operational systems or data warehouses was defined by the CNB, thus giving the credit institutions all the flexibility they wanted. On the other hand, the ECB BIRD proposes data model structures, i.e. different cubes. While the ECB BIRD describes Variables and Domains, the CNB BIRD requires and describes attributes and code lists. The ECB's BIRD variables could in a broader sense be different measures, dimensional keys, different attributes, dates, etc. On the other hand, apart from the reporting date, the CNB BIRD already divided all other dates into categories on the reporting agent side with clearly defined code lists (Annex 4). As already explained in Chapter 2.4, the CNB's system is uniformly designed so that the attributes describe the measure and therefore only one measure with many attributes is delivered with each record. The CNB BIRD is highly categorised and there are code lists for almost every attribute, including instruments. For counterparty legal entities, identifiers defined by the Ministry of Finance or the Croatian Bureau of Statistics can be checked using the algorithm used to create the identifiers. Both systems define and describe validation rules, which are a set of logical conditions that data should comply with. Another integral part of the ECB BIRD is derivation rules, transformations that create new variables from existing data, and generation rules, transformations focused on the data preparation based on the formalities described for each output framework. Both dictionaries also describe technical rules; the ECB BIRD does so in order to complete the description of the transformation process, while the CNB BIRD gives instructions on how to build an input record on the reporting agent side, which is actually a flat file (attribute length and type, how to treat leading zeros, how to treat non-applicable values, how to report the sign, etc.).

On the logical level, the CNB data production process is probably best described by Figure 3. Instead of the ECB BIRD input layer, there is an input record layer on both the reporting agent and the CNB side. As already mentioned in the introduction, the CNB collects data at a granular counterparty level for legal entities and non-residents (provided on the ECB MFI list or in Annex 4 of the Croatian National Bank Banks' Integrated Reporting Dictionary), and at an aggregate level for households, other non-residents and small businesses, all of them on an instrument-by-instrument basis. Via published metadata rules, the CNB builds many aggregated reports and sends feedback to the reporting agents.

**Figure 3**

The CNB data production process - an overview



## 4 Modelling reports

### 4.1 Enterprise data warehouse - a brief overview

As already mentioned in the CNB System design chapter, in 2010 an enterprise data warehouse was implemented at the CNB as an output side (CNB Analytical system, Figure 1) of the system. A multidimensional star scheme was developed, using the same granularity as the one on the input side of the system; counterparty- by-counterparty, instrument-by-instrument. From the enterprise data warehouse many multidimensional aggregations (data marts) have been made to satisfy different business needs.

The enterprise data warehouse and multidimensional aggregations would be refreshed every night in case new transactions from reporting agents had arrived. Data from reporting agents should be delivered:

- Up to the 6th working day (preliminary data - M21 version) or 42nd calendar day (final data - M23 version)
- After the deadline (M24 version) a reporting agent is only able to deliver the data with the approval of an authorised CNB employee from Statistics and Supervision (data will not be automatically passed into the system)
- Occasionally, data can be changed as a result of on-site or off-site Supervision or Statistics findings, changes to the law, financial report analysis or changes in the sector of the counterparty initiated by the Croatian Bureau of Statistics

Using business intelligence reporting functionalities, interactive dashboards and some predefined reports with many filtering capabilities have been created. Users are also able to customise their own reports by using the filtering function, navigation and dynamic data decomposition to the level of the counterparty. Different access rights are determined depending on business needs and data confidentiality. The most advanced users are also able to create their own reports from scratch using the ad hoc capabilities of the reporting tool to the lowest level of detail, as provided in the input record.

### 4.2 Balance sheet metadata mapping

Reporting agents deliver data to the CNB at a granular level, counterparty-by-counterparty for legal entities/non-residents on the list and at an aggregate level for households, other non-residents and small businesses, all of them on an instrument-by-instrument basis. Even though users can analyse data at the granular level using the ad hoc capabilities of the reporting tool, an additional level of data transformation had to be carried out to produce different reports as defined by business users.

A balance sheet report is the most commonly used report. In order to be able to produce it from the enterprise data warehouse, metadata mapping definitions have been provided by Supervision and Statistics using the CNB Banks' Integrated Reporting Dictionary.

On its website the CNB has published metadata mapping rules for creating many different reports. The largest two sets of reports are the so-called supervisory reports and aggregated statistical reports (ASI)<sup>29</sup>. This chapter covers creating balance sheets in the enterprise data warehouse as defined by Supervision. Table 11 gives an overview of the business methodology used for balance sheet definition.

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<sup>29</sup> [CNB ASI monthly and quarterly aggregation rules.](#)



**Table 11**

Balance sheet aggregation rules as defined by Supervision

| Table 1:<br>Report BN1 –<br>Balance sheet        | Report<br>short<br>code | Tag  | Type of<br>record<br>code | Instrument codes                                                                 | Portfolio<br>codes | Risk<br>group<br>codes | Currency<br>codes | Indexation<br>codes | Capital<br>characteristics<br>codes | Type of<br>amount<br>codes<br>+ | Type of<br>amount<br>codes<br>- | Calculation<br>rule                         |
|--------------------------------------------------|-------------------------|------|---------------------------|----------------------------------------------------------------------------------|--------------------|------------------------|-------------------|---------------------|-------------------------------------|---------------------------------|---------------------------------|---------------------------------------------|
|                                                  |                         |      | 1                         | 2                                                                                | 3                  | 4                      | 5                 | 6                   | 7                                   | 8                               | 9                               | 10                                          |
| <b>Cash</b>                                      | BN1                     | 1001 | AA                        | A0101, A0102                                                                     | XXX                | *                      | *                 | *                   | *                                   | 01                              |                                 |                                             |
|                                                  | BN1                     | 2001 | AA                        | A0101, A0102                                                                     | XXX                | *                      | NOT<br>(HRK)      | *                   | *                                   | 01                              |                                 |                                             |
|                                                  | BN1                     | 3001 | AA                        | A0101, A0102                                                                     | XXX                | *                      | HRK               | J, V                | *                                   | 01                              |                                 |                                             |
| <b>Financial<br/>assets held for<br/>trading</b> | BN1                     | 1002 |                           |                                                                                  |                    |                        |                   |                     |                                     |                                 |                                 | BN1(P1003 +<br>P1004 +<br>P1005 +<br>P1006) |
|                                                  | BN1                     | 2002 |                           |                                                                                  |                    |                        |                   |                     |                                     |                                 |                                 | BN1(P2003 +<br>P2004 +<br>P2005 +<br>P2006) |
|                                                  | BN1                     | 3002 |                           |                                                                                  |                    |                        |                   |                     |                                     |                                 |                                 | BN1(P3003 +<br>P3004 +<br>P3005 +<br>P3006) |
| <b>Derivatives<br/>held for<br/>trading</b>      | BN1                     | 1003 | AA                        | from A0501 to<br>A0506                                                           | DRT                | *                      | *                 | *                   | *                                   | 10, 03, 04                      | 06                              |                                             |
|                                                  | BN1                     | 2003 | AA                        | from A0501 to<br>A0506                                                           | DRT                | *                      | NOT<br>(HRK)      | *                   | *                                   | 10, 03, 04                      | 06                              |                                             |
|                                                  | BN1                     | 3003 |                           |                                                                                  |                    |                        |                   |                     |                                     |                                 |                                 |                                             |
| <b>Equity<br/>instruments</b>                    | BN1                     | 1004 | AA                        | A0401, A0402,<br>A0404                                                           | DRT                | *                      | *                 | *                   | *                                   | 10, 03, 04                      | 06                              |                                             |
|                                                  | BN1                     | 2004 | AA                        | A0401, A0402,<br>A0404                                                           | DRT                | *                      | NOT<br>(HRK)      | *                   | *                                   | 10, 03, 04                      | 06                              |                                             |
|                                                  | BN1                     | 3004 | AA                        | A0401, A0402,<br>A0404                                                           | DRT                | *                      | HRK               | J, V                | *                                   | 10, 03, 04                      | 06                              |                                             |
| <b>Debts<br/>securities</b>                      | BN1                     | 1005 | AA                        | from A0301 to<br>A0307, A0403                                                    | DRT                | *                      | *                 | *                   | *                                   | 03, 04,<br>10, 12               | 06                              |                                             |
|                                                  | BN1                     | 2005 | AA                        | from A0301 to<br>A0307, A0403                                                    | DRT                | *                      | NOT<br>(HRK)      | *                   | *                                   | 03, 04,<br>10, 12               | 06                              |                                             |
|                                                  | BN1                     | 3005 | AA                        | from A0301 to<br>A0307, A0403                                                    | DRT                | *                      | HRK               | J, V                | *                                   | 03, 04,<br>10, 12               | 06                              |                                             |
| <b>Loans and<br/>advances</b>                    | BN1                     | 1006 | AA                        | A0206, from<br>A0208 to A0210,<br>from A0212 to<br>A0219, from<br>A0222 to A0233 | DRT                | *                      | *                 | *                   | *                                   | 03, 04,<br>10, 12               | 06                              |                                             |
|                                                  | BN1                     | 2006 | AA                        | A0206, from<br>A0208 to A0210,<br>from A0212 to<br>A0219, from<br>A0222 to A0233 | DRT                | *                      | NOT<br>(HRK)      | *                   | *                                   | 03, 04,<br>10, 12               | 06                              |                                             |
|                                                  | BN1                     | 3006 | AA                        | A0206, from<br>A0208 to A0210,<br>from A0212 to<br>A0219, from<br>A0222 to A0233 | DRT                | *                      | HRK               | J, V                | *                                   | 03, 04,<br>10, 12               | 06                              |                                             |

Note: Report BN1 - Balance sheet definition (fragment). See full definition in Annex 2.

The Tag column in Table 11 represents the code for an aggregation rule. For the technical implementation, it is created from the report short code (in case of Table 11 this is 'BN1') concatenated with a dash ('-') and consecutive number e.g. '1001'. The

consecutive number represents aggregation rule change regardless of the attribute being used to trigger the change. Given the complexity of aggregation rules (different Boolean operators and SQL clauses could be used), many metadata tables have been created to support aggregation rule calculation as explained further on in this chapter and presented in Tables 12 to 17. Consecutive number changes for every different total or subtotal are also set out in the report .

In order to create a balance sheet the following attributes from the CNB BIRD have been used: Type of record code, Instrument codes, Portfolio codes, Risk group codes, Currency codes, Indexation code, Capital characteristics codes and Type of amount codes. The Type of record code with AA (balance sheet record) value is used for filtering, in order to extract balance sheet records from among the many records received from reporting agents. Instruments can be defined one by one, e.g. A0101 or A0102, as in the case of the “Cash” reporting line item, or in ranges (from A0501 to A0506), as in the case of “Derivatives held for trading”. Portfolio code may not be applicable (XXX), as in the case of “Cash”, while it should be defined in the case of “Derivatives held for trading” to the value of DRT that is precisely defined in the CNB BIRD. An asterisk under Risk group code replaces any possible value. Risk group code would not be defined as an attribute for creating reports unless there was at least one reporting line item that uses a specific Risk group code as a criterion for calculation. Combinations of the attributes Currency and Indexation code in the case of the reporting line “Cash” are explained in Table 12.

**Table 12**  
Examples of indexation modalities

| Tag      | Currency code | Indexation code | Explanation                                                                                                                                                |
|----------|---------------|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|
| BN1-1001 | *             | *               | All currencies                                                                                                                                             |
| BN1-2001 | NOT(HRK)      | *               | Balance sheet amount in foreign currency (CNB receives amounts in HRK, foreign currency is indicated and amount could be recalculated using exchange rate) |
| BN1-3001 | HRK           | J, V            | Balance sheet amount in HRK - nominated in one currency while payable in HRK                                                                               |

An asterisk under “Capital characteristics code” replaces any possible value. The attribute “Type of amount code” has been separated into two columns. In the case of “Derivatives held for trading”, namely Type of amount codes 10, 03 and 04, i.e.:

- *fair value which does not include data on respective outstanding or overdue interest or dividends and accompanying value adjustments*
- *claims (liabilities) arising from accrued interest receivable or dividend payable*
- *claims (liabilities) arising from overdue interest or dividend*

have to be added, while Type of amount code 06, i.e. “Value adjustments of claims arising from interests or dividends”, must be subtracted. The “Calculation rule” column indicates which reporting line items should be added or subtracted to get an aggregated position.

As the enterprise data warehouse was implemented in 2010 and by that time the required reports had already been implemented in a transactional database that is not covered in this article, the balance sheet report has been slightly simplified and only tags beginning with 1xxx were calculated. Tags beginning with 1xxx stand for Total Amount, tags beginning with 2xxx stand for Foreign Currency Amount, while tags beginning 3xxx stand for HRK indexed to the foreign currency. The balance sheet layout as published on the CNB website is presented in Annex 1.

For the purpose of the analysis, a five-level hierarchy for reporting line items has also been implemented, even though not all five levels are mandatory. In the case of “Derivatives held for trading”, the first level of the hierarchy would be “Assets” (*Aktiva* in Croatian), the second level would be “Total assets” (*Ukupna imovina in Croatian*) and the third level would be “Derivatives held for trading”. Using this hierarchy, balance sheet aggregated positions are summarised via a reporting tool default functionality. Unlike the European Central Bank and its many balance sheet reports that use “of which” for special cases, the CNB has not defined many.

To support business definition and produce balance sheets and other reports, 9 tables for configuring metadata have been defined:

- Master table for configuring the hierarchy of the reporting line items, including information about sectors, currency, country, maturity, special cases of legal entities or special cases in general
- Detail table for filtering record types (AA for balance sheet, RA for profit and loss record, etc.)
- Detail table for configuring consolidated/non-consolidated reports and preliminary reports/reports after external auditing codes
- Detail table for configuring Instrument codes
- Detail table for configuring Capital characteristic codes
- Detail table for configuring Portfolio codes
- Detail table for configuring Risk group codes
- Detail table for configuring Type of amount codes that have to be used for calculating total amount including the multiplier (1 for all amounts that have to be added and -1 for all amounts that have to be subtracted)
- Detail table for all kinds of arithmetical operations based on already calculated tags of any report line items (like  $BN1-1002 = BN1(P1003+P1004+P1005+P1006)$ )

The following SQL clauses have been supported when configuring metadata; LIKE, <>, IN, BETWEEN, =, NOT IN. In the case of loans, tag BN1-1006 configuration is done as presented in Tables 13, 14, 15, 16 and 17.

**Table 13**

Type of record code metadata configuration, Loans, tag BN1-1006

| Tag      | Type of record code | Type of record code operator |
|----------|---------------------|------------------------------|
| BN1-1006 | AA                  | =                            |

**Table 14**

Consolidation and Preliminary or revised code metadata configuration, Loans, tag BN1-1006

| Tag      | Consolidation / Preliminary or revised code | Consolidation / Preliminary or revised code operator |
|----------|---------------------------------------------|------------------------------------------------------|
| BN1-1006 | NP                                          | =                                                    |

Note: For technical implementation, combinations of attributes 3 and 4, Table 3 are configured together in one database column

**Table 15**

Instrument codes metadata configuration, Loans, tag BN1-1006

| Tag      | Instruments code from | Instruments code to | Instruments code operator |
|----------|-----------------------|---------------------|---------------------------|
| BN1-1006 | A0206                 |                     | =                         |
| BN1-1006 | A0208                 | A0210               | BETWEEN                   |
| BN1-1006 | A0212                 | A0219               | BETWEEN                   |
| BN1-1006 | A0222                 | A0233               | BETWEEN                   |

**Table 16**

Portfolio codes metadata configuration, Loans, tag BN1-1006

| Tag      | Portfolio code | Portfolio code operator |
|----------|----------------|-------------------------|
| BN1-1006 | DRT            | =                       |

**Table 17**

Type of amount codes metadata configuration, Loans, tag BN1-1006

| Tag      | Type of amount code | Type of amount code operator | Amount multiplier |
|----------|---------------------|------------------------------|-------------------|
| BN1-1006 | 10,03,04            | IN                           | 1                 |
| BN1-1006 | 06                  | =                            | -1                |

For technical implementation, configuration of the Type of amount code is done without using leading zeros (leading zeros keep the Input record structure fixed)

### 4.3 Balance sheet item calculation

A combination of the data from the master table and the metadata from the detail tables have been used to design and create the report dimension. Using the

metadata from the detail configuration tables every amount has been joined with the report dimension via a concatenated code created in the following sequence:

```
Type_of_record_code$Consolidation/Preliminary_or_revised_code$Instrument_code  
$Capital_characteristics_code$Portfolio_code$Risk_group_code$Type_of_amount_  
code
```

Similarly, a SDMX code is created from the Data Structure Definition code lists produced by the ECB, but taking into account different dimensions and attributes. As a result, a straightforward relationship between the CNB and the ECB data cannot be established.

For “Derivatives held for trading”, the tag BN1-1003, one of the concatenated code combinations could be AA\$NP\$A0501\$-\$DRT\$-\$10. The Capital characteristics code and Risk group code are not applicable for the calculation of the tag BN1-1003, therefore a dash has been used. The concatenated code is in one to many relationships between the amount and the report dimension. More than one report can be joined with the amount using the same concatenated code. An exact report therefore has to be specified when carrying out the analysis or creating dashboards.

Finally, the tag BN1-1003 “Derivatives held for trading” would be calculated and filtered for the respective reporting date as follows:

```
SELECT SUM (CASE WHEN Type_of_amount_code in (10, 03, 04, 06) THEN Amount*Amount_Multiplier ELSE NULL END) Amount  
FROM Amounts, Attributes_of_amount, Instruments, Portfolios  
WHERE  
Amounts.Attributes_of_amount_id=Attributes_of_amount.Id  
AND Amount.Instruments_id=Instruments.Id  
AND Amount.Portfolios_id=Portfolios.Id  
AND Type_of_record_code = 'AA'  
AND Consolidation_Preliminary_revised_code ='NP'  
AND Instruments_code BETWEEN 'A0501' AND 'A0506'  
AND Portfolio_code='DRT';30
```

Although a balance sheet report contains many reporting line items, the code producing it is quite short. Most of the metadata configuration is done in tables, most of the calculation logic is done in database objects, the so-called views, and some configuration is done in the repository of the Business Intelligence reporting tool. The rest of the code is done using a graphical ETL (Extract, Transform, Load) interface. Therefore, having many repetitive and hardcoded IF statements in the ETL code is avoided.

## 4.4 Credit risk and interest rate statistics

The CNB produces any kind of interest statistics using AA (balance sheet record) and KS (interest rate record) Type of record codes. Instrument modalities cover all loans and deposits. The type of amount in KS record type can be the

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<sup>30</sup> To be used for illustration only. Tables and column names do not reflect technical implementation.

nominal/effective interest rate on the outstanding amount/new business or the amount of new business (outstanding amounts are taken from AA).

In the Additional Data Records chapter, it was mentioned that the CNB system was built around one measure that can be amount, interest rate, number of employees, etc. In order to create monetary interest rate statistics more measures are needed: outstanding or new business amount and nominal or effective interest rates. The first step when producing statistics on outstanding amounts is to pair the data from AA and KS Type of record code at counterparty level (by matching each of the same attributes defined for AA and KS Type of record code as presented in Table 7). A similar principle is used for new businesses; however, in the case of new businesses pairing is done using the KS record type only. Table 18 is a simplified presentation of the data as received by reporting agents at the counterparty level.

**Table 18**  
Data from balance sheet and interest rate (AA and KS) records by counterparty

| Reporting period | Type of record code | Counterparty ID | Type of amount code | Measure   | Instrument codes |
|------------------|---------------------|-----------------|---------------------|-----------|------------------|
| 20150630         | AA                  | 123456          | 1                   | 10.000,00 | A0215            |
| 20150630         | KS                  | 123456          | 44                  | 4,57      | A0215            |

Note: Simplified presentation: attributes as received by reporting agents.

Using several ETL transformations, the data will be transformed into one record by the counterparty as presented in Table 19. In cases where the counterparty had more than one loan at the credit institution, the outstanding amount would be aggregated and the nominal interest rate calculated as the average interest rate. This design comes from the aggregation rules, taking into consideration the Type of amount code.

**Table 19**  
Data transformed from AA and KS records into one record by counterparty

| Reporting period | Type of record code | Counterparty ID | Type of amount code from AA | Outstanding amount from AA | Type of amount code from KS | Nominal interest rate on outstanding amount from KS | Instrument codes |
|------------------|---------------------|-----------------|-----------------------------|----------------------------|-----------------------------|-----------------------------------------------------|------------------|
| 20150630         | AA, KS              | 123456          | 1                           | 10.000,00                  | 44                          | 4,57                                                | A0215            |

Note: Simplified pairing of AA and KS Type of record code attributes.

This transformed record is the basis for creating interest rate statistics using the data as defined in the CNB Banks' Integrated Reporting Dictionary and explained in the chapter entitled "Balance sheet metadata mapping". Table 20 presents the metadata definition for calculating the outstanding amount and average weighted nominal interest rate on outstanding amount for housing loans. The attributes used here are Instrument codes, Type of record codes, Consolidation/Preliminary or revised codes, Sector ESA 2010 codes, Currency group codes, Original maturity, Marketability codes and Risk group codes. Outstanding amount is taken from the AA record

(balance sheet record) where Types of amount codes 1<sup>31</sup>, 2, 10 and 12 are added, while Type of amount code 7 is subtracted and also used in further calculations as the denominator. The nominator is calculated by multiplying every particular loan amount, Type of amount codes 1, 2, 7, 10, 12 by its interest rate, Type of amount 44 taken from the paired KS record type. Finally, the average weighted interest rate is calculated as the ratio between the nominator and the denominator. As the data has been left at the counterparty level (Business Intelligence reporting data warehouse solution supports filtering by all AA - balance sheet record, KS - interest rate record attributes including some CNB internally derived attributes), the final calculation of the average weighted interest rate is done on the fly depending on the data selected for analysis and the set of filters a business user has applied.

**Table 20**  
Interest rate metadata definition, housing loans

|                                      | KPI number | Instrument codes | Type of record codes | Consolidation + Preliminary or revised codes | Sector ESA2010 codes | Currency group codes | Original maturity | Marketability codes | Risk group codes | Outstanding amount    | Average weighted NKS on outstanding amount           |
|--------------------------------------|------------|------------------|----------------------|----------------------------------------------|----------------------|----------------------|-------------------|---------------------|------------------|-----------------------|------------------------------------------------------|
| <b>Assets</b>                        |            |                  |                      |                                              |                      |                      |                   |                     |                  |                       |                                                      |
| <b>Loans</b>                         |            |                  |                      |                                              |                      |                      |                   |                     |                  |                       |                                                      |
| <b>Households</b>                    |            |                  |                      |                                              |                      |                      |                   |                     |                  |                       |                                                      |
| <b>Housing loans</b>                 |            | A0215            |                      |                                              |                      |                      |                   |                     |                  | K21+K22+K23           | $(K21*L21+K22*L22+K23*L23) / (K21+K22+K23)$          |
| <b>up to 1 year</b>                  | 6          | A0215            | AA, KS               | NP                                           | 14, 15002, 15003     | HRK, EUR             | ≤12               | N, U ili blank*     | AA, A9, 00       | $\sum(1+2-7+10+12)_i$ | $\sum(((1+2-7+10+12)_i)^{44}) / \sum(1+2-7+10+12)_i$ |
| <b>over 1 year and up to 5 years</b> | 7          | A0215            | AA, KS               | NP                                           | 14, 15002, 15003     | HRK, EUR             | 12<x≤60           | N, U ili blank*     | AA, A9, 00       | $\sum(1+2-7+10+12)_i$ | $\sum(((1+2-7+10+12)_i)^{44}) / \sum(1+2-7+10+12)_i$ |
| <b>over 5 years</b>                  | 8          | A0215            | AA, KS               | NP                                           | 14, 15002, 15003     | HRK, EUR             | >60               | N, U ili blank*     | AA, A9, 00       | $\sum(1+2-7+10+12)_i$ | $\sum(((1+2-7+10+12)_i)^{44}) / \sum(1+2-7+10+12)_i$ |

Note: K21, K22, K23, L21, L22 and L23 stand for excel columns K and L and excel rows 21, 22 and 23. See full definition in Annex 3.

A new ETL solution was developed. A programme called Loader was developed to load business definition from MS Excel into the database. The second programme, known as Parser, was developed to give meaning to all of the arithmetical operators, special characters, SQL clauses, row and column labels, hidden rows, hierarchies and SDMX codes used.

## 4.5 Croatian National Bank system extension due to Anacredit requirements

On 31 March 2017, the Governor of the Croatian National Bank, Boris Vujčić, announced that the CNB would prepare a Eurozone strategy document that would

<sup>31</sup> Code list for Type of amount code has been simplified by omitting the leading zeros from the metadata definition.

include a calculation of all benefits and risks for Croatia joining the Eurozone.<sup>32</sup> The document will serve as the basis for a public consultation.

Being a non-Eurozone country, Croatia is not obliged to send the Anacredit (Regulation (EU) 2016/867)<sup>33</sup> data in the first phase of the project. On the other hand, Croatia has joined the ECB's Anacredit working groups. The full scope of the extension of the CNB system for the Anacredit requirements<sup>34</sup> will be the subject of a gap analysis. To protect the investment already made, the CNB system will probably be extended with additional attributes, identifiers and dates, which will be included in the CNB BIRD. One of the major extensions will be the collection of the Contract\_Id, which will enable the identification of all debtors except private persons. As the data collected by the CNB is also used to produce MIR statistics, no threshold will be set. This extension will affect balance sheet and interest rate records (AA and KS record type) and the pairing mechanism at the counterparty level as described in Chapter 4.4. Balance sheet and interest rate records will be paired via Contract\_Id where available, while the rest of the counterparty pairing system (via collected attributes) will not be affected. The system will be upgraded with the dates, as for now all the dates except for the reporting date are divided into categories (time buckets). It is possible that a new Type of record code will be added to the system, depending on the Anacredit requirements. Collecting dates may be redundant with collection of dates divided into categories, but keeping dates divided into categories could preserve investment already being made in the Input record.

Using the same methodology as presented in Table 20 and described in Chapter 4.4, only with different aggregation rules, the CNB's existing credit risk analysis multidimensional data mart will be extended with attributes, dates and possibly new dimensions if needed. It is expected that the CNB credit risk multidimensional data mart data will be the source for cubes defined by the Anacredit project, even though a new multidimensional data mart may be added to satisfy the requirements. Some external data sources may also be used to report enterprise size, number of employees, etc.

Given the complexity of an upgrade and future deadlines, the CNB may decide to develop a new solution from scratch or buy and customise a commercial credit risk solution.

## 4.6 European Central Bank balance sheets

In order to adopt ECB balance sheets, a slightly different approach has been adopted. As the ECB balance sheet by sectors (Regulation ECB/2013/33), Assets and Liabilities was very detailed in its definition in terms of columns, the CNB introduced a horizontal and vertical report dimension. The metadata for creating balance sheets were defined in MS Excel, in two sheets called in Croatian *Aktiva*

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<sup>32</sup> See <http://euro.hnb.hr>.

<sup>33</sup> [AnaCredit Regulation](#).

<sup>34</sup> [ECB BIRD AnaCredit](#).



and *Pasiva*, using the CNB Banks' Integrated Reporting Dictionary and a similar methodology as explained in the "Balance sheet metadata mapping" chapter. Though most of the reporting positions have been defined straightforwardly using the granular data, there were also many exceptions compared to the national balance sheet definition. Some exceptions were related to:

- the special treatment of particular instruments and sectors,
- the special treatment of a particular reporting agent, instrument and counterparty,
- the special treatment of small businesses
- "of which" positions, etc.

SDMX Assets and Liabilities codes have been put in the same MS Excel file, as received from the ECB (MFI BSI series keys). Then, the **Aktiva** metadata sheet, as defined by the CNB, was linked with **Table 1. Assets** (SDMX codes) as received by the ECB, while the **Pasiva** metadata sheet was linked with **Table 1. Liabilities** (SDMX codes) as presented in Figure 4. Therefore, the MFI BSI amount for Debt securities held in HRK (Croatian currency Kuna) with original maturity less than one year for A. Domestic, MFIs is defined and calculated as follows:

- Calculate amount for #row\_code 18, #column\_code 11 using metadata as defined in rows (#Instruments, #Type of record, #Consolidation/Preliminary, #Marketability, #Original maturity and #Type of amount, #Currency) and columns ( #Level\_1, #Level\_2, #Sector), take into account the negative sign for #Type of amount 7
- Calculate amount for #row\_code 19, #column\_code 11 using metadata as defined in rows (#Instruments, #Type of record, #Consolidation/Preliminary, #Marketability, #Original maturity and #Type of amount, #Currency) and columns ( #Level\_1, #Level\_2, #Sector), take into account the negative sign for #Type of amount 7
- Calculate amount for #row\_code 17, #column\_code 11 as sum of amounts for #row\_code 18 and #row\_code 19, #column\_code 11
- Do not display in the final Report amount calculated for #row\_code 18 and #row\_code 19, #column\_code 11, display only calculated amount for #row\_code 17 and #column\_code 11
- Assign SDMX code as defined in Table 1. Assets, #Assets\_row\_code 28, #Assets column\_code B to the amount calculated in #row\_code 17 and #column\_code 11

**Figure 4**  
ECB balance sheet definition

|    | A             | B           | C | D |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|----|---------------|-------------|---|---|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| 1  | BALANCE SHEET | A. Domestic |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 2  | ITEMS         | MFIs        |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 3  |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 4  |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 5  |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 6  |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 7  |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 8  |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 9  |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 10 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 11 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 12 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 13 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 14 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 15 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 16 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 17 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 18 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 19 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 20 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 21 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 22 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 23 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 24 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 25 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 26 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 27 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 28 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 29 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 30 |               |             |   |   |  |  |  |  |  |  |  |  |  |  |  |  |  |  |

Note: ECB balance sheet by sectors definition (fragment).

The new ETL solution was developed using experience from calculating interest rate statistics. The programme Loader was extended to load business definition from MS Excel into the database. The second programme, known as Parser, was extended and developed to give meaning to all arithmetical operators used, SQL clauses, row and column labels, hidden rows, hierarchies, SDMX codes and so on. Similarly, as for the national balance sheet definition most of the metadata configuration is done in supporting tables/dimensions and most of the calculation logic is done in database objects, the so-called “views”. The rest of the code was very short and is done by using PL/SQL. Essentially, all the calculations are done in two loops. The first loop calculates all the reporting line items where metadata is defined including “of which” positions, and the second loop calculates hierarchies (totals and subtotals excluding “of which” positions). The reporting layout was produced using a standard Business Intelligence reporting solution. The CNB also calculated reporting positions not required by the ECB. The final filtering of the data sent to the ECB was carried out just before creating the file to be sent to the ECB via the EXDI channel.

The decision to create matrix reports for ECB needs, adding a vertical and horizontal report dimension to the ECB data model and linking SDMX codes with the horizontal and vertical position of every calculated amount, was driven by the fact that the relationship between ECB defined instruments and CNB defined instruments was not straightforward, on an instrument-by-instrument basis. A combination of CNB defined attributes: Instrument codes, Marketability codes, Type of amount codes in relation to the sign of the amount (Type of amount code 7 should be subtracted while the others should be added) matches the ECB Instrument definition as presented in Table 21

for Debt securities. As Instrument codes, Marketability codes and Type of amount codes were designed as three separate data warehouse dimensions, grouping them in one dimension for ECB needs would require a substantial data warehouse reconfiguration. The question of sign also needed to be addressed.

**Table 21**  
SDMX Instrument code in relation to CNB attributes

| DSD CL_BS_ITEM code | Code description     | CNB instrument codes       | Marketability codes | Type of amount code (+) | Type of amount code (-) |
|---------------------|----------------------|----------------------------|---------------------|-------------------------|-------------------------|
| L40                 | Debt security issued | P0501, P0502, P0503, P0505 | *                   | 1,2,8,10,12             | 7                       |

Note: '\*' replaces any given value, including 'not applicable' for liability instruments.

## 5 Conclusion

Many years later, the CNB reporting system is still considered to be a great success. It is one of the most granular and most flexible central bank reporting systems in the EU. It enables CNB researchers to drill down into the data to produce very precise and accurate analyses for CNB management and international institutions, almost at an individual contract level of detail.

When Croatia acceded to the EU in mid-2013, the system was readily used to produce all reports required by the ECB in the area of monetary statistics. The data collection system is also used to produce consolidated balance sheet data and bulletin tables of credit institutions as well as bulletin tables for monetary interest rate statistics defined and published by the CNB. The CNB uses the granular data to calculate the balance sheet flows; these are calculated by using (i) the difference between the stocks of the current and previous month's main balance sheet records and (ii) the re-evaluations originating from changes in stock records from principal and interest write-offs, coverage adjustments, reclassification adjustments and price adjustments. The calculation of the exchange rate adjustments, by taking the exchange rate and stocks for the previous and current month into account, make up the final element for the flows calculation formula. A further point is that the collected data provides valuable input to other areas of statistics production by the CNB, such as financial accounts statistics, fiscal statistics, BOP statistics, securities issues statistics, etc.

The system is also used to support supervision (one of the CNB's important functions) and to produce many additional key performance indicators set by Supervision and calculated at the CNB. These performance indicators exist in relation to the areas of regulatory capital and capital requirements, asset quality, earnings, liquidity, compliance, credit risk exposure, profitability, balance sheet structure, deposit structure and credit structure, besides others. Supervision reports include, but are not limited to, report on balance sheet and off-balance-sheet items, credit risk exposure by risk categories, holdings in the capital of an undertaking, tangible assets, acquired assets, exposures to debtors, exposure to currency-induced credit risk, past due receivables, the remaining maturity of assets and liabilities, exposure to protection providers, changes in value adjustments and provisions, income statement, daily balances of trading books, detailed trading book based on financial instruments and many more.

Collecting reporting templates is more cost-effective in terms of the time, personnel, hardware and software needed for data collection, storage, revision, data transformation, analysis and dissemination. The biggest advantage of using a granular collection system is the ability to use the reported granular data, conveniently stored in the data warehouse, when carrying out drill-down investigations or producing sophisticated analyses in the areas of research and financial stability at the central bank. Additionally, these data have been extensively used for performing state-of-the-art financial stability analyses, for both public

(Financial Stability Review) and internal purposes. Such internal purposes include the use of detailed data: for stress testing credit institutions' capital positions; as early warning signals of illiquidity/insolvency; when creating behavioural models for assessing the probability of default; when classifying non-financial companies according to the credit risk, etc. These analyses are essential for providing the central bank's management with a high quality assessment of micro and macro risks in the financial sector.

As well as its analytical value, granular data bring one particular benefit to a purely statistical function – namely, the ability to produce long time series of backdata at the counterparty level in the event of a change in statistical methodology (as was the case for the changeover to ESA 2010).

The data warehouse has become the central point of data integration. The next level for the CNB is to enrich granular data with many different data sources at the counterparty level, such as financial agency data from the leading company in Croatia in the field of financial mediation and quality business information, in order to be able to push data science analyses further and beyond.

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# Annexes

## Annex 1

### Report BN1 - Balance sheet (layout)

|                                                                                        | Total | Foreign currency | HRK indexed to the foreign currency |
|----------------------------------------------------------------------------------------|-------|------------------|-------------------------------------|
| <b>ASSETS</b>                                                                          |       |                  |                                     |
| <b>Cash</b>                                                                            | 1001  | 2001             | 3001                                |
| <b>Financial assets held for trading</b>                                               | 1002  | 2002             | 3002                                |
| Derivatives held for trading                                                           | 1003  | 2003             | 3003                                |
| Equity instruments                                                                     | 1004  | 2004             | 3004                                |
| Debt securities                                                                        | 1005  | 2005             | 3005                                |
| Loans and advances                                                                     | 1006  | 2006             | 3006                                |
| <b>Financial assets designated at fair value through profit or loss</b>                | 1007  | 2007             | 3007                                |
| Equity instruments                                                                     | 1008  | 2008             | 3008                                |
| Debt securities                                                                        | 1009  | 2009             | 3009                                |
| Loans and advances                                                                     | 1010  | 2010             | 3010                                |
| <b>Financial assets available for sale</b>                                             | 1011  | 2011             | 3011                                |
| Equity instruments                                                                     | 1012  | 2012             | 3012                                |
| Debt securities                                                                        | 1013  | 2013             | 3013                                |
| Loans and advances                                                                     | 1014  | 2014             | 3014                                |
| <b>Loans and receivables (including financial leasing)</b>                             | 1015  | 2015             | 3015                                |
| Deposits at CNB                                                                        | 1016  | 2016             | 3016                                |
| Other deposits (except deposits at CNB)                                                | 1017  | 2017             | 3017                                |
| Debt securities                                                                        | 1018  | 2018             | 3018                                |
| Loans and advances                                                                     | 1019  | 2019             | 3019                                |
| <b>Held-to-maturity investments</b>                                                    | 1020  | 2020             | 3020                                |
| Debt securities                                                                        | 1021  | 2021             | 3021                                |
| Loans and advances                                                                     | 1022  | 2022             | 3022                                |
| <b>Derivatives - Hedge accounting</b>                                                  | 1023  | 2023             | 3023                                |
| Micro hedging                                                                          | 1024  | 2024             | 3024                                |
| Macro hedging from credit risk                                                         | 1025  | 2025             | 3025                                |
| <b>Fair value changes of the hedged items in portfolio hedge of interest rate risk</b> | 1026  | 2026             | 3026                                |
| <b>Tangible assets</b>                                                                 | 1027  | 2027             | 3027                                |
| Property, Plant and Equipment                                                          | 1028  | 2028             | 3028                                |
| Investment property                                                                    | 1029  | 2029             | 3029                                |
| <b>Intangible assets</b>                                                               | 1030  | 2030             | 3030                                |
| Goodwill                                                                               | 1031  | 2031             | 3031                                |
| Other intangible assets                                                                | 1032  | 2032             | 3032                                |
| <b>Investments in subsidiaries, joint venture and associates</b>                       | 1033  | 2033             | 3033                                |
| <b>Tax assets</b>                                                                      | 1034  | 2034             | 3034                                |
| Current tax assets                                                                     | 1035  | 2035             | 3035                                |



|                                                                                        |                                                                                 | Total | Foreign currency | HRK indexed to the foreign currency |
|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|-------|------------------|-------------------------------------|
|                                                                                        | Deferred tax assets                                                             | 1036  | 2036             | 3036                                |
| <b>Non-current assets and disposal groups classified as held for sale</b>              |                                                                                 | 1037  | 2037             | 3037                                |
| <b>Other assets</b>                                                                    |                                                                                 | 1038  | 2038             | 3038                                |
|                                                                                        | Note: value adjustments for losses on group level                               | 1039  | 2039             | 3039                                |
| <b>TOTAL ASSETS</b>                                                                    |                                                                                 | 1040  | 2040             | 3040                                |
| <b>LIABILITIES</b>                                                                     |                                                                                 |       |                  |                                     |
| <b>Financial liabilities held for trading</b>                                          |                                                                                 | 1041  | 2041             | 3041                                |
|                                                                                        | Derivatives held for trading                                                    | 1042  | 2042             | 3042                                |
|                                                                                        | Financial liabilities for trading - short selling                               | 1043  | 2043             | 3043                                |
|                                                                                        | Other financial liabilities for trading                                         | 1044  | 2044             | 3044                                |
| <b>Financial liabilities designated at fair value through profit or loss</b>           |                                                                                 | 1045  | 2045             | 3045                                |
| <b>Financial liabilities measured at amortised cost</b>                                |                                                                                 | 1046  | 2046             | 3046                                |
|                                                                                        | Electronic money                                                                | 1047  | 2047             | 3047                                |
|                                                                                        | Current accounts                                                                | 1048  | 2048             | 3048                                |
|                                                                                        | Savings deposits                                                                | 1049  | 2049             | 3049                                |
|                                                                                        | Deposits with agreed maturity                                                   | 1050  | 2050             | 3050                                |
|                                                                                        | Other received deposits                                                         | 1051  | 2051             | 3051                                |
|                                                                                        | Received loans                                                                  | 1052  | 2052             | 3052                                |
|                                                                                        | Debt securities                                                                 | 1053  | 2053             | 3053                                |
|                                                                                        | Hybrid and subordinated instruments                                             | 1054  | 2054             | 3054                                |
|                                                                                        | Other financial liabilities measured at amortised cost                          | 1055  | 2055             | 3055                                |
| <b>Derivatives - Hedge accounting</b>                                                  |                                                                                 | 1056  | 2056             | 3056                                |
|                                                                                        | Micro hedging                                                                   | 1057  | 2057             | 3057                                |
|                                                                                        | Macro hedging from credit risk                                                  | 1058  | 2058             | 3058                                |
| <b>Fair value changes of the hedged items in portfolio hedge of interest rate risk</b> |                                                                                 | 1059  | 2059             | 3059                                |
| <b>Reservations</b>                                                                    |                                                                                 | 1060  | 2060             | 3060                                |
|                                                                                        | Reservations for restructuring costs                                            | 1061  | 2061             | 3061                                |
|                                                                                        | Reservations for pending legal issues and tax litigation                        | 1062  | 2062             | 3062                                |
|                                                                                        | Reservations for staff costs                                                    | 1063  | 2063             | 3063                                |
|                                                                                        | Reservations for pensions and other post-employment defined benefit obligations | 1064  | 2064             | 3064                                |
|                                                                                        | Reservations for off-balance sheet losses                                       | 1065  | 2065             | 3065                                |
|                                                                                        | Reservations for adverse contracts                                              | 1066  | 2066             | 3066                                |
|                                                                                        | Other reservations                                                              | 1067  | 2067             | 3067                                |
| <b>Tax liabilities</b>                                                                 |                                                                                 | 1068  | 2068             | 3068                                |
|                                                                                        | Current tax liabilities                                                         | 1069  | 2069             | 3069                                |
|                                                                                        | Deferred tax liabilities                                                        | 1070  | 2070             | 3070                                |
| <b>Liabilities included in disposal groups classified as held for sale</b>             |                                                                                 | 1071  | 2071             | 3071                                |
| <b>Other liabilities</b>                                                               |                                                                                 | 1072  | 2072             | 3072                                |

|                                                              | Total                                                                                   | Foreign currency | HRK indexed to the foreign currency |      |
|--------------------------------------------------------------|-----------------------------------------------------------------------------------------|------------------|-------------------------------------|------|
| <b>TOTAL LIABILITIES</b>                                     | 1073                                                                                    | 2073             | 3073                                |      |
| <b>CAPITAL</b>                                               |                                                                                         |                  |                                     |      |
| <b>Capital</b>                                               | 1074                                                                                    | 2074             | 3074                                |      |
|                                                              | Paid up capital                                                                         | 1075             | 2075                                | 3075 |
|                                                              | Share premium                                                                           | 1076             | 2076                                | 3076 |
|                                                              | Equity component of compound financial instruments                                      | 1077             | 2077                                | 3077 |
| <b>Revaluation reserves</b>                                  | 1078                                                                                    | 2078             | 3078                                |      |
|                                                              | Non-realised profit (loss) from value adjustments - Financial assets available for sale | 1079             | 2079                                | 3079 |
|                                                              | Foreign currency translation                                                            | 1080             | 2080                                | 3080 |
|                                                              | Tangible asset reserves                                                                 | 1081             | 2081                                | 3081 |
|                                                              | Intangible asset reserves                                                               | 1082             | 2082                                | 3082 |
|                                                              | Hedge of net investments in foreign operations [effective portion]                      | 1083             | 2083                                | 3083 |
|                                                              | Hedging derivatives. Cash flow hedges [effective portion]                               | 1084             | 2084                                | 3084 |
|                                                              | Non-current assets and disposal groups classified as held for sale                      | 1085             | 2085                                | 3085 |
|                                                              | Other revaluation reserves                                                              | 1086             | 2086                                | 3086 |
| <b>Reserves</b>                                              | 1087                                                                                    | 2087             | 3087                                |      |
|                                                              | Law reserves                                                                            | 1088             | 2088                                | 3088 |
|                                                              | Other capital reserves                                                                  | 1089             | 2089                                | 3089 |
|                                                              | Capital profit (loss) gained by sale/buy back own shares                                | 1090             | 2090                                | 3090 |
| <b>Own shares</b>                                            | 1091                                                                                    | 2091             | 3091                                |      |
| <b>Retained profit (loss)</b>                                | 1092                                                                                    | 2092             | 3092                                |      |
| <b>Profit/loss previous year</b>                             | 1093                                                                                    | 2093             | 3093                                |      |
| <b>Profit/loss current year</b>                              | 1094                                                                                    | 2094             | 3094                                |      |
| <b>Majority share owner capital (only for consolidation)</b> | 1095                                                                                    | 2095             | 3095                                |      |
| <b>Minority share owner capital (only for consolidation)</b> | 1096                                                                                    | 2096             | 3096                                |      |
| <b>TOTAL CAPITAL</b>                                         | 1097                                                                                    | 2097             | 3097                                |      |
| <b>TOTAL LIABILITIES AND CAPITAL</b>                         | 1098                                                                                    | 2098             | 3098                                |      |

## Annex 2

### Report BN1 - Balance sheet aggregation rules

| Table 1: Report BN1 – Balance sheet                                     | Report short code | Tag  | Type of record code | Instrument codes                                                     | Portfolio codes | Risk group codes | Currency codes | Indexation codes | Capital characteristics codes | Type of amount codes (+) | Type of amount codes (-) | Calculation rule                   |
|-------------------------------------------------------------------------|-------------------|------|---------------------|----------------------------------------------------------------------|-----------------|------------------|----------------|------------------|-------------------------------|--------------------------|--------------------------|------------------------------------|
|                                                                         |                   | 1    | 2                   |                                                                      | 3               | 4                | 5              | 6                | 7                             | 8                        | 9                        | 10                                 |
| <b>Cash</b>                                                             | BN1               | 1001 | AA                  | A0101, A0102                                                         | XXX             | *                | *              | *                | *                             | 01                       |                          |                                    |
|                                                                         | BN1               | 2001 | AA                  | A0101, A0102                                                         | XXX             | *                | NOT (HRK)      | *                | *                             | 01                       |                          |                                    |
|                                                                         | BN1               | 3001 | AA                  | A0101, A0102                                                         | XXX             | *                | HRK            | J, V             | *                             | 01                       |                          |                                    |
| <b>Financial assets held for trading</b>                                | BN1               | 1002 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          | BN1(P1003 + P1004 + P1005 + P1006) |
|                                                                         | BN1               | 2002 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          | BN1(P2003 + P2004 + P2005 + P2006) |
|                                                                         | BN1               | 3002 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          | BN1(P3003 + P3004 + P3005 + P3006) |
| <b>Derivatives held for trading</b>                                     | BN1               | 1003 | AA                  | from A0501 to A0506                                                  | DRT             | *                | *              | *                | *                             | 10, 03, 04               | 06                       |                                    |
|                                                                         | BN1               | 2003 | AA                  | from A0501 to A0506                                                  | DRT             | *                | NOT (HRK)      | *                | *                             | 10, 03, 04               | 06                       |                                    |
|                                                                         | BN1               | 3003 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          |                                    |
| <b>Equity instruments</b>                                               | BN1               | 1004 | AA                  | A0401, A0402, A0404                                                  | DRT             | *                | *              | *                | *                             | 10, 03, 04               | 06                       |                                    |
|                                                                         | BN1               | 2004 | AA                  | A0401, A0402, A0404                                                  | DRT             | *                | NOT (HRK)      | *                | *                             | 10, 03, 04               | 06                       |                                    |
|                                                                         | BN1               | 3004 | AA                  | A0401, A0402, A0404                                                  | DRT             | *                | HRK            | J, V             | *                             | 10, 03, 04               | 06                       |                                    |
| <b>Debts securities</b>                                                 | BN1               | 1005 | AA                  | from A0301 to A0307, A0403                                           | DRT             | *                | *              | *                | *                             | 03, 04, 10, 12           | 06                       |                                    |
|                                                                         | BN1               | 2005 | AA                  | from A0301 to A0307, A0403                                           | DRT             | *                | NOT (HRK)      | *                | *                             | 03, 04, 10, 12           | 06                       |                                    |
|                                                                         | BN1               | 3005 | AA                  | from A0301 to A0307, A0403                                           | DRT             | *                | HRK            | J, V             | *                             | 03, 04, 10, 12           | 06                       |                                    |
| <b>Loans and advances</b>                                               | BN1               | 1006 | AA                  | A0206, from A0208 to A0210, from A0212 to A0219, from A0222 to A0233 | DRT             | *                | *              | *                | *                             | 03, 04, 10, 12           | 06                       |                                    |
|                                                                         | BN1               | 2006 | AA                  | A0206, from A0208 to A0210, from A0212 to A0219, from A0222 to A0233 | DRT             | *                | NOT (HRK)      | *                | *                             | 03, 04, 10, 12           | 06                       |                                    |
|                                                                         | BN1               | 3006 | AA                  | A0206, from A0208 to A0210, from A0212 to A0219, from A0222 to A0233 | DRT             | *                | HRK            | J, V             | *                             | 03, 04, 10, 12           | 06                       |                                    |
| <b>Financial assets designated at fair value through profit or loss</b> | BN1               | 1007 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          | BN1(P1008 + P1009 + P1010)         |
|                                                                         | BN1               | 2007 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          | BN1(P2008 + P2009 + P2010)         |

| Table 1: Report BN1 – Balance sheet        | Report short code | Tag  | Type of record code | Instrument codes                                                     | Portfolio codes | Risk group codes | Currency codes | Indexation codes | Capital characteristics codes | Type of amount codes (+) | Type of amount codes (-) | Calculation rule           |
|--------------------------------------------|-------------------|------|---------------------|----------------------------------------------------------------------|-----------------|------------------|----------------|------------------|-------------------------------|--------------------------|--------------------------|----------------------------|
|                                            | BN1               | 3007 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          | BN1(P3008 + P3009 + P3010) |
| <b>Equity instruments</b>                  | BN1               | 1008 | AA                  | A0401, A0402, A0404                                                  | FVO             | *                | *              | *                | *                             | 10, 03, 04               | 06                       |                            |
|                                            | BN1               | 2008 | AA                  | A0401, A0402, A0404                                                  | FVO             | *                | NOT (HRK)      | *                | *                             | 10, 03, 04               | 06                       |                            |
|                                            | BN1               | 3008 | AA                  | A0401, A0402, A0404                                                  | FVO             | *                | HRK            | J, V             | *                             | 10, 03, 04               | 06                       |                            |
| <b>Debts securities</b>                    | BN1               | 1009 | AA                  | from A0301 to A0307, A0403                                           | FVO             | *                | *              | *                | *                             | 03, 04, 10, 12           | 06                       |                            |
|                                            | BN1               | 2009 | AA                  | from A0301 to A0307, A0403                                           | FVO             | *                | NOT (HRK)      | *                | *                             | 03, 04, 10, 12           | 06                       |                            |
|                                            | BN1               | 3009 | AA                  | from A0301 to A0307, A0403                                           | FVO             | *                | HRK            | J, V             | *                             | 03, 04, 10, 12           | 06                       |                            |
| <b>Loans and advances</b>                  | BN1               | 1010 | AA                  | A0206, from A0208 to A0210, from A0212 to A0219, from A0222 to A0233 | FVO             | *                | *              | *                | *                             | 03, 04, 10, 12           | 06                       |                            |
|                                            | BN1               | 2010 | AA                  | A0206, from A0208 to A0210, from A0212 to A0219, from A0222 to A0233 | FVO             | *                | NOT (HRK)      | *                | *                             | 03, 04, 10, 12           | 06                       |                            |
|                                            | BN1               | 3010 | AA                  | A0206, from A0208 to A0210, from A0212 to A0219, from A0222 to A0233 | FVO             | *                | HRK            | J, V             | *                             | 03, 04, 10, 12           | 06                       |                            |
| <b>Financial assets available for sale</b> | BN1               | 1011 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          | BN1(P1012 + P1013 + P1014) |
|                                            | BN1               | 2011 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          | BN1(P2012 + P2013 + P2014) |
|                                            | BN1               | 3011 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          | BN1(P3012 + P3013 + P3014) |
| <b>Equity instruments</b>                  | BN1               | 1012 | AA                  | A0401, A0402, A0404                                                  | RZP             | *                | *              | *                | *                             | 10, 03, 04               | 05, 06                   |                            |
|                                            | BN1               | 2012 | AA                  | A0401, A0402, A0404                                                  | RZP             | *                | NOT (HRK)      | *                | *                             | 10, 03, 04               | 05, 06                   |                            |
|                                            | BN1               | 3012 | AA                  | A0401, A0402, A0404                                                  | RZP             | *                | HRK            | J, V             | *                             | 10, 03, 04               | 05, 06                   |                            |
| <b>Debts securities</b>                    | BN1               | 1013 | AA                  | from A0301 to A0307, A0403                                           | RZP             | *                | *              | *                | *                             | 02, 03, 04, 10, 12       | 05, 06                   |                            |
|                                            | BN1               | 2013 | AA                  | from A0301 to A0307, A0403                                           | RZP             | *                | NOT (HRK)      | *                | *                             | 02, 03, 04, 10, 12       | 05, 06                   |                            |
|                                            | BN1               | 3013 | AA                  | from A0301 to A0307, A0403                                           | RZP             | *                | HRK            | J, V             | *                             | 02, 03, 04, 10, 12       | 05, 06                   |                            |
| <b>Loans and advances</b>                  | BN1               | 1014 | AA                  | A0206, from A0208 to A0210, from A0212 to A0219, from A0222 to A0233 | RZP             | *                | *              | *                | *                             | 02, 03, 04, 10, 12       | 05, 06                   |                            |
|                                            | BN1               | 2014 | AA                  | A0206, from A0208 to A0210, from A0212 to A0219, from                | RZP             | *                | NOT (HRK)      | *                | *                             | 02, 03, 04, 10, 12       | 05, 06                   |                            |

| Table 1: Report BN1 – Balance sheet                        | Report short code | Tag  | Type of record code | Instrument codes                                                              | Portfolio codes | Risk group codes | Currency codes | Indexation codes | Capital characteristics codes | Type of amount codes (+) | Type of amount codes (-) | Calculation rule                   |
|------------------------------------------------------------|-------------------|------|---------------------|-------------------------------------------------------------------------------|-----------------|------------------|----------------|------------------|-------------------------------|--------------------------|--------------------------|------------------------------------|
|                                                            |                   |      |                     | A0222 to A0233                                                                |                 |                  |                |                  |                               |                          |                          |                                    |
|                                                            | BN1               | 3014 | AA                  | A0206, from A0208 to A0210, from A0212 to A0219, from A0222 to A0233          | RZP             | *                | HRK            | J, V             | *                             | 02, 03, 04, 10, 12       | 05, 06                   |                                    |
| <b>Loans and receivables (including financial leasing)</b> | BN1               | 1015 |                     |                                                                               |                 |                  |                |                  |                               |                          |                          | BN1(P1016 + P1017 + P1018 + P1019) |
|                                                            | BN1               | 2015 |                     |                                                                               |                 |                  |                |                  |                               |                          |                          | BN1(P2016 + P2017 + P2018 + P2019) |
|                                                            | BN1               | 3015 |                     |                                                                               |                 |                  |                |                  |                               |                          |                          | BN1(P3016 + P3017 + P3018 + P3019) |
| <b>Deposits at CNB</b>                                     | BN1               | 1016 | AA                  | from A0201 to A0205, A0308                                                    | KIP             | *                | *              | *                | *                             | 01, 03, 04               | 05                       |                                    |
|                                                            | BN1               | 2016 | AA                  | from A0201 to A0205, A0308                                                    | KIP             | *                | NOT (HRK)      | *                | *                             | 01, 03, 04               | 05                       |                                    |
|                                                            | BN1               | 3016 | AA                  | from A0201 to A0205, A0308                                                    | KIP             | *                | HRK            | J, V             | *                             | 01, 03, 04               | 05                       |                                    |
| <b>Other deposits (except deposits at CNB)</b>             | BN1               | 1017 | AA                  | A0206, A0231                                                                  | KIP             | *                | *              | *                | *                             | 01, 02, 03, 04, 12       | 05, 06                   |                                    |
|                                                            | BN1               | 2017 | AA                  | A0206, A0231                                                                  | KIP             | *                | NOT (HRK)      | *                | *                             | 01, 02, 03, 04, 12       | 05, 06                   |                                    |
|                                                            | BN1               | 3017 | AA                  | A0206, A0231                                                                  | KIP             | *                | HRK            | J, V             | *                             | 01, 02, 03, 04, 12       | 05, 06                   |                                    |
| <b>Debts securities</b>                                    | BN1               | 1018 | AA                  | from A0301 to A0307                                                           | KIP             | *                | *              | *                | *                             | 01, 02, 03, 04, 08, 12   | 05, 06, 07               |                                    |
|                                                            | BN1               | 2018 | AA                  | from A0301 to A0307                                                           | KIP             | *                | NOT (HRK)      | *                | *                             | 01, 02, 03, 04, 08, 12   | 05, 06, 07               |                                    |
|                                                            | BN1               | 3018 | AA                  | from A0301 to A0307                                                           | KIP             | *                | HRK            | J, V             | *                             | 01, 02, 03, 04, 08, 12   | 05, 06, 07               |                                    |
| <b>Loans and advances</b>                                  | BN1               | 1019 | AA                  | A0207 to A0210, from A0212 to A0230, A0232, A0233, A0603, A0701, A9998, A9999 | KIP             | *                | *              | *                | *                             | 01, 02, 03, 04, 08, 12   | 05, 06, 07               |                                    |
|                                                            | BN1               | 2019 | AA                  | A0207 to A0210, from A0212 to A0230, A0232, A0233, A0603, A0701, A9998, A9999 | KIP             | *                | NOT (HRK)      | *                | *                             | 01, 02, 03, 04, 08, 12   | 05, 06, 07               |                                    |
|                                                            | BN1               | 3019 | AA                  | A0207 to A0210, from A0212 to A0230, A0232, A0233, A0603, A0701, A9998, A9999 | KIP             | *                | HRK            | J, V             | *                             | 01, 02, 03, 04, 08, 12   | 05, 06, 07               |                                    |
| <b>Investments held-to-maturity</b>                        | BN1               | 1020 |                     |                                                                               |                 |                  |                |                  |                               |                          |                          | BN1(P1021 + P1022)                 |
|                                                            | BN1               | 2020 |                     |                                                                               |                 |                  |                |                  |                               |                          |                          | BN1(P2021 + P2022)                 |

| Table 1: Report BN1 – Balance sheet                                                    | Report short code | Tag  | Type of record code | Instrument codes                                                     | Portfolio codes | Risk group codes | Currency codes | Indexation codes | Capital characteristics codes | Type of amount codes (+) | Type of amount codes (-) | Calculation rule   |
|----------------------------------------------------------------------------------------|-------------------|------|---------------------|----------------------------------------------------------------------|-----------------|------------------|----------------|------------------|-------------------------------|--------------------------|--------------------------|--------------------|
|                                                                                        | BN1               | 3020 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          | BN1(P3021 + P3022) |
| <b>Debt securities</b>                                                                 | BN1               | 1021 | AA                  | from A0301 to A0307, A9999                                           | DDD             | *                | *              | *                | *                             | 01, 02, 03, 04, 08, 12   | 05, 06, 07               |                    |
|                                                                                        | BN1               | 2021 | AA                  | from A0301 to A0307, A9999                                           | DDD             | *                | NOT (HRK)      | *                | *                             | 01, 02, 03, 04, 08, 12   | 05, 06, 07               |                    |
|                                                                                        | BN1               | 3021 | AA                  | from A0301 to A0307, A9999                                           | DDD             | *                | HRK            | J, V             | *                             | 01, 02, 03, 04, 08, 12   | 05, 06, 07               |                    |
| <b>Loans and advances</b>                                                              | BN1               | 1022 | AA                  | A0206, from A0208 to A0210, from A0212 to A0219, from A0222 to A0233 | DDD             | *                | *              | *                | *                             | 01, 02, 03, 04, 12       | 05, 06                   |                    |
|                                                                                        | BN1               | 2022 | AA                  | A0206, from A0208 to A0210, from A0212 to A0219, from A0222 to A0233 | DDD             | *                | NOT (HRK)      | *                | *                             | 01, 02, 03, 04, 12       | 05, 06                   |                    |
|                                                                                        | BN1               | 3022 | AA                  | A0206, from A0208 to A0210, from A0212 to A0219, from A0222 to A0233 | DDD             | *                | HRK            | J, V             | *                             | 01, 02, 03, 04, 12       | 05, 06                   |                    |
| <b>Derivatives - Hedge accounting</b>                                                  | BN1               | 1023 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          | BN1(P1024 + P1025) |
|                                                                                        | BN1               | 2023 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          | BN1(P2024 + P2025) |
|                                                                                        | BN1               | 3023 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Micro hedging</b>                                                                   | BN1               | 1024 | AA                  | from A0501 to A0506                                                  | ZFV, ZNT, ZUI   | *                | *              | *                | *                             | 03, 04, 06, 10           |                          |                    |
|                                                                                        | BN1               | 2024 | AA                  | from A0501 to A0506                                                  | ZFV, ZNT, ZUI   | *                | NOT (HRK)      | *                | *                             | 03, 04, 06, 10           |                          |                    |
|                                                                                        | BN1               | 3024 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Macro hedging from credit risk</b>                                                  | BN1               | 1025 | AA                  | from A0501 to A0506                                                  | ZFM             | *                | *              | *                | *                             | 03, 04, 06, 10           |                          |                    |
|                                                                                        | BN1               | 2025 | AA                  | from A0501 to A0506                                                  | ZFM             | *                | NOT (HRK)      | *                | *                             | 03, 04, 06, 10           |                          |                    |
|                                                                                        | BN1               | 3025 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Fair value changes of the hedged items in portfolio hedge of interest rate risk</b> | BN1               | 1026 | AA                  | A0507                                                                | XXX             | *                | *              | *                | *                             | 10                       |                          |                    |
|                                                                                        | BN1               | 2026 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          |                    |
|                                                                                        | BN1               | 3026 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Tangible assets</b>                                                                 | BN1               | 1027 |                     |                                                                      |                 |                  |                |                  |                               |                          |                          | BN1(P1028 + P1029) |

| Table 1: Report BN1 – Balance sheet                              | Report short code | Tag  | Type of record code | Instrument codes                                | Portfolio codes | Risk group codes | Currency codes | Indexation codes | Capital characteristics codes | Type of amount codes (+) | Type of amount codes (-) | Calculation rule   |
|------------------------------------------------------------------|-------------------|------|---------------------|-------------------------------------------------|-----------------|------------------|----------------|------------------|-------------------------------|--------------------------|--------------------------|--------------------|
|                                                                  | BN1               | 2027 |                     |                                                 |                 |                  |                |                  |                               |                          |                          | BN1(P2028 + P2029) |
|                                                                  | BN1               | 3027 |                     |                                                 |                 |                  |                |                  |                               |                          |                          | BN1(P3028 + P3029) |
| <b>Property, Plant and Equipment</b>                             | BN1               | 1028 | AA                  | from A0802 to A0807, from A0902 to A0907, A0234 | XXX             | *                | *              | *                | *                             | 01, 10                   | 05                       |                    |
|                                                                  | BN1               | 2028 | AA                  | from A0802 to A0807, from A0902 to A0907, A0234 | XXX             | *                | NOT (HRK)      | *                | *                             | 01, 10                   | 05                       |                    |
|                                                                  | BN1               | 3028 |                     |                                                 |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Investment property</b>                                       | BN1               | 1029 | AA                  | from A0802 to A0807, from A0902 to A0907        | UUN             | *                | *              | *                | *                             | 10                       | 05                       |                    |
|                                                                  | BN1               | 2029 | AA                  | from A0802 to A0807, from A0902 to A0907        | UUN             | *                | NOT (HRK)      | *                | *                             | 10                       | 05                       |                    |
|                                                                  | BN1               | 3029 |                     |                                                 |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Intangible assets</b>                                         | BN1               | 1030 |                     |                                                 |                 |                  |                |                  |                               |                          |                          | BN1(P1031 + P1032) |
|                                                                  | BN1               | 2030 |                     |                                                 |                 |                  |                |                  |                               |                          |                          | BN1(P2031 + P2032) |
|                                                                  | BN1               | 3030 |                     |                                                 |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Goodwill</b>                                                  | BN1               | 1031 | AA                  | A1002                                           | XXX             | *                | *              | *                | *                             | 01                       | 05                       |                    |
|                                                                  | BN1               | 2031 | AA                  | A1002                                           | XXX             | *                | NOT (HRK)      | *                | *                             | 01                       | 05                       |                    |
|                                                                  | BN1               | 3031 |                     |                                                 |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Other intangible assets</b>                                   | BN1               | 1032 | AA                  | from A1003 to A1006                             | XXX             | *                | *              | *                | *                             | 01                       | 05                       |                    |
|                                                                  | BN1               | 2032 | AA                  | from A1003 to A1006                             | XXX             | *                | NOT (HRK)      | *                | *                             | 01                       | 05                       |                    |
|                                                                  | BN1               | 3032 |                     |                                                 |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Investments in subsidiaries, joint venture and associates</b> | BN1               | 1033 | AA                  | A0401, A0402, A0404                             | UPO, UPD, UZP   | *                | *              | *                | *                             | 03, 04, 10               | 05, 06                   |                    |
|                                                                  | BN1               | 2033 | AA                  | A0401, A0402, A0404                             | UPO, UPD, UZP   | *                | NOT (HRK)      | *                | *                             | 03, 04, 10               | 05, 06                   |                    |
|                                                                  | BN1               | 3033 |                     |                                                 |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Tax assets</b>                                                | BN1               | 1034 |                     |                                                 |                 |                  |                |                  |                               |                          |                          | BN1(P1035 + P1036) |
|                                                                  | BN1               | 2034 |                     |                                                 |                 |                  |                |                  |                               |                          |                          | BN1(P2035 + P2036) |
|                                                                  | BN1               | 3034 |                     |                                                 |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Current tax assets</b>                                        | BN1               | 1035 | AA                  | A0601                                           | KIP             | *                | *              | *                | *                             | 01, 02                   | 05                       |                    |

| Table 1: Report BN1 – Balance sheet                                       | Report short code | Tag  | Type of record code | Instrument codes                                | Portfolio codes | Risk group codes | Currency codes | Indexation codes | Capital characteristics codes | Type of amount codes (+)   | Type of amount codes (-) | Calculation rule                                                                                                   |
|---------------------------------------------------------------------------|-------------------|------|---------------------|-------------------------------------------------|-----------------|------------------|----------------|------------------|-------------------------------|----------------------------|--------------------------|--------------------------------------------------------------------------------------------------------------------|
|                                                                           | BN1               | 2035 | AA                  | A0601                                           | KIP             | *                | NOT (HRK)      | *                | *                             | 01, 02                     | 05                       |                                                                                                                    |
|                                                                           | BN1               | 3035 |                     |                                                 |                 |                  |                |                  |                               |                            |                          |                                                                                                                    |
| <b>Deferred tax assets</b>                                                | BN1               | 1036 | AA                  | A0602                                           | XXX             | *                | *              | *                | *                             | 01                         |                          |                                                                                                                    |
|                                                                           | BN1               | 2036 | AA                  | A0602                                           | XXX             | *                | NOT (HRK)      | *                | *                             | 01                         |                          |                                                                                                                    |
|                                                                           | BN1               | 3036 |                     |                                                 |                 |                  |                |                  |                               |                            |                          |                                                                                                                    |
| <b>Non-current assets and disposal groups classified as held for sale</b> | BN1               | 1037 | AA                  | A*                                              | DIP, GOP        | *                | *              | *                | *                             | 01, 02, 03, 04, 08, 10, 12 | 05, 06, 07               |                                                                                                                    |
|                                                                           | BN1               | 2037 | AA                  | A*                                              | DIP, GOP        | *                | NOT (HRK)      | *                | *                             | 01, 02, 03, 04, 08, 10, 12 | 05, 06, 07               |                                                                                                                    |
|                                                                           | BN1               | 3037 | AA                  | A*                                              | DIP, GOP        | *                | HRK            | J, V             | *                             | 01, 02, 03, 04, 08, 10, 12 | 05, 06, 07               |                                                                                                                    |
| <b>Other assets</b>                                                       | BN1               | 1038 | AA                  | A0702, A0703, A9992, A9993, A9996, A9997, A9999 | XXX             | *                | *              | *                | *                             | 01, 02, 03, 04, 08, 10, 12 | 05, 06, 07               |                                                                                                                    |
|                                                                           | BN1               | 2038 | AA                  | A0702, A0703, A9992, A9993, A9996, A9997, A9999 | XXX             | *                | NOT (HRK)      | *                | *                             | 01, 02, 03, 04, 08, 10, 12 | 05, 06, 07               |                                                                                                                    |
|                                                                           | BN1               | 3038 | AA                  | A0702, A0703, A9992, A9993, A9996, A9997, A9999 | XXX             | *                | HRK            | J, V             | *                             | 01, 02, 03, 04, 08, 10, 12 | 05, 06, 07               |                                                                                                                    |
| <b>Note: value adjustments for losses on group level</b>                  | BN1               | 1039 | AA                  | A*                                              | *               | AA, A9           | *              | *                | *                             | 05                         |                          |                                                                                                                    |
|                                                                           | BN1               | 2039 |                     |                                                 |                 |                  |                |                  |                               |                            |                          |                                                                                                                    |
|                                                                           | BN1               | 3039 |                     |                                                 |                 |                  |                |                  |                               |                            |                          |                                                                                                                    |
| <b>TOTAL ASSETS</b>                                                       | BN1               | 1040 |                     |                                                 |                 |                  |                |                  |                               |                            |                          | BN1(P1001 + P1002 + P1007 + P1011 + P1015 + P1020 + P1023 + P1026 + P1027 + P1030 + P1033 + P1034 + P1037 + P1038) |
|                                                                           | BN1               | 2040 |                     |                                                 |                 |                  |                |                  |                               |                            |                          | BN1(P2001 + P2002 + P2007 + P2011 + P2015 + P2020 + P2023 + P2026 + P2027 + P2030 + P2033 + P2034 + P2037 + P2038) |
|                                                                           | BN1               | 3040 |                     |                                                 |                 |                  |                |                  |                               |                            |                          | BN1(P3001 + P3002 + P3007 + P3011 + P3015 + P3020 + P3023 + P3026 + P3027 + P3030 + P3033 + P3034 + P3037 + P3038) |
| <b>Financial liabilities held for trading</b>                             | BN1               | 1041 |                     |                                                 |                 |                  |                |                  |                               |                            |                          | BN1(P1042 + P1043)                                                                                                 |
|                                                                           | BN1               | 2041 |                     |                                                 |                 |                  |                |                  |                               |                            |                          | BN1(P2042 + P2043)                                                                                                 |
|                                                                           | BN1               | 3041 |                     |                                                 |                 |                  |                |                  |                               |                            |                          | BN1(P3042 + P3043)                                                                                                 |



| Table 1: Report BN1 – Balance sheet                                          | Report short code | Tag  | Type of record code | Instrument codes    | Portfolio codes | Risk group codes | Currency codes | Indexation codes | Capital characteristics codes | Type of amount codes (+) | Type of amount codes (-) | Calculation rule                                                           |
|------------------------------------------------------------------------------|-------------------|------|---------------------|---------------------|-----------------|------------------|----------------|------------------|-------------------------------|--------------------------|--------------------------|----------------------------------------------------------------------------|
| <b>Derivatives held for trading</b>                                          | BN1               | 1042 | AA                  | from P0701 to P0706 | DRT             |                  | *              | *                | *                             | 03, 04, 10               |                          |                                                                            |
|                                                                              | BN1               | 2042 | AA                  | from P0701 to P0706 | DRT             |                  | NOT (HRK)      | *                | *                             | 03, 04, 10               |                          |                                                                            |
|                                                                              | BN1               | 3042 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                                            |
| <b>Financial liabilities for trading - short selling</b>                     | BN1               | 1043 | AA                  | P0601               | DRT             |                  | *              | *                | *                             | 10                       |                          |                                                                            |
|                                                                              | BN1               | 2043 | AA                  | P0601               | DRT             |                  | NOT (HRK)      | *                | *                             | 10                       |                          |                                                                            |
|                                                                              | BN1               | 3043 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                                            |
| <b>Other financial liabilities for trading</b>                               | BN1               | 1044 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                                            |
|                                                                              | BN1               | 2044 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                                            |
|                                                                              | BN1               | 3044 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                                            |
| <b>Financial liabilities designated at fair value through profit or loss</b> | BN1               | 1045 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                                            |
|                                                                              | BN1               | 2045 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                                            |
|                                                                              | BN1               | 3045 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                                            |
| <b>Financial liabilities measured at amortised cost</b>                      | BN1               | 1046 |                     |                     |                 |                  |                |                  |                               |                          |                          | BN1(P1047 + P1048 + P1049 + P1050 + P1051 + P1052 + P1053 + P1054 + P1055) |
|                                                                              | BN1               | 2046 |                     |                     |                 |                  |                |                  |                               |                          |                          | BN1(P2047 + P2048 + P2049 + P2050 + P2051 + P2052 + P2053 + P2054 + P2055) |
|                                                                              | BN1               | 3046 |                     |                     |                 |                  |                |                  |                               |                          |                          | BN1(P3047 + P3048 + P3049 + P3050 + P3051 + P3052 + P3053 + P3054 + P3055) |
| <b>Electronic money</b>                                                      | BN1               | 1047 | AA                  | P0301, P0302        | XXX             | *                | *              | *                | *                             | 01                       |                          |                                                                            |
|                                                                              | BN1               | 2047 | AA                  | P0301, P0302        | XXX             | *                | NOT (HRK)      | *                | *                             | 01                       |                          |                                                                            |
|                                                                              | BN1               | 3047 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                                            |
| <b>Current accounts</b>                                                      | BN1               | 1048 | AA                  | P0201               | XXX             | *                | *              | *                | *                             | 01, 03, 04               |                          |                                                                            |
|                                                                              | BN1               | 2048 | AA                  | P0201               | XXX             | *                | NOT (HRK)      | *                | *                             | 01, 03, 04               |                          |                                                                            |
|                                                                              | BN1               | 3048 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                                            |
| <b>Savings deposits</b>                                                      | BN1               | 1049 | AA                  | P0202               | AMT             | *                | *              | *                | *                             | 01, 03, 04, 12           |                          |                                                                            |
|                                                                              | BN1               | 2049 | AA                  | P0202               | AMT             | *                | NOT (HRK)      | *                | *                             | 01, 03, 04, 12           |                          |                                                                            |
|                                                                              | BN1               | 3049 | AA                  | P0202               | AMT             | *                | HRK            | J, V             | *                             | 01, 03, 04, 12           |                          |                                                                            |

| Table 1: Report BN1 – Balance sheet                           | Report short code | Tag  | Type of record code | Instrument codes                  | Portfolio codes | Risk group codes | Currency codes | Indexation codes | Capital characteristics codes | Type of amount codes (+) | Type of amount codes (-) | Calculation rule |
|---------------------------------------------------------------|-------------------|------|---------------------|-----------------------------------|-----------------|------------------|----------------|------------------|-------------------------------|--------------------------|--------------------------|------------------|
| <b>Deposits with agreed maturity</b>                          | BN1               | 1050 | AA                  | P0203                             | AMT             | *                | *              | *                | N, D                          | 01, 02, 03, 04, 12       |                          |                  |
|                                                               | BN1               | 2050 | AA                  | P0203                             | AMT             | *                | NOT (HRK)      | *                | N, D                          | 01, 02, 03, 04, 12       |                          |                  |
|                                                               | BN1               | 3050 | AA                  | P0203                             | AMT             | *                | HRK            | J, V             | N, D                          | 01, 02, 03, 04, 12       |                          |                  |
| <b>Other received deposits</b>                                | BN1               | 1051 | AA                  | P0204, P0205, P0206, P0213        | AMT             | *                | *              | *                | N, D                          | 01, 02, 03, 04, 12       |                          |                  |
|                                                               | BN1               | 2051 | AA                  | P0204, P0205, P0206, P0213        | AMT             | *                | NOT (HRK)      | *                | N, D                          | 01, 02, 03, 04, 12       |                          |                  |
|                                                               | BN1               | 3051 | AA                  | P0204, P0205, P0206, P0213        | AMT             | *                | HRK            | J, V             | N, D                          | 01, 02, 03, 04, 12       |                          |                  |
| <b>Received loans</b>                                         | BN1               | 1052 | AA                  | from P0207 to P0212               | AMT             | *                | *              | *                | N, D                          | 01, 02, 03, 04, 12       |                          |                  |
|                                                               | BN1               | 2052 | AA                  | from P0207 to P0212               | AMT             | *                | NOT (HRK)      | *                | N, D                          | 01, 02, 03, 04, 12       |                          |                  |
|                                                               | BN1               | 3052 | AA                  | from P0207 to P0212               | AMT             | *                | HRK            | J, V             | N, D                          | 01, 02, 03, 04, 12       |                          |                  |
| <b>Debt securities</b>                                        | BN1               | 1053 | AA                  | P0501, P0502, P0505, P0506        | AMT             | *                | *              | *                | N, D                          | 01, 02, 03, 04, 08, 12   | 07                       |                  |
|                                                               | BN1               | 2053 | AA                  | P0501, P0502, P0505, P0506        | AMT             | *                | NOT (HRK)      | *                | N, D                          | 01, 02, 03, 04, 08, 12   | 07                       |                  |
|                                                               | BN1               | 3053 | AA                  | P0501, P0502, P0505, P0506        | AMT             | *                | HRK            | J, V             | N, D                          | 01, 02, 03, 04, 08, 12   | 07                       |                  |
| <b>Hybrid and subordinated instruments</b>                    | BN1               | 1054 | AA                  | P*                                | AMT             | *                | *              | *                | P, H                          | 01, 02, 03, 04, 08, 12   | 07                       |                  |
|                                                               | BN1               | 2054 | AA                  | P*                                | AMT             | *                | NOT (HRK)      | *                | P, H                          | 01, 02, 03, 04, 08, 12   | 07                       |                  |
|                                                               | BN1               | 3054 | AA                  | P*                                | AMT             | *                | HRK            | J, V             | P, H                          | 01, 02, 03, 04, 08, 12   | 07                       |                  |
| <b>Other financial liabilities measured at amortised cost</b> | BN1               | 1055 | AA                  | P0602, P1002, P1003, P9998, P9999 | AMT             | *                | *              | *                | *                             | 01, 02, 03, 04, 12       |                          |                  |
|                                                               | BN1               | 2055 | AA                  | P0602, P1002, P1003, P9998, P9999 | AMT             | *                | NOT (HRK)      | *                | *                             | 01, 02, 03, 04, 12       |                          |                  |
|                                                               | BN1               | 3055 | AA                  | P0602, P1002, P1003, P9998,       | AMT             | *                | HRK            | J, V             | *                             | 01, 02, 03,              |                          |                  |

| Table 1: Report BN1 – Balance sheet                                                    | Report short code | Tag  | Type of record code | Instrument codes    | Portfolio codes | Risk group codes | Currency codes | Indexation codes | Capital characteristics codes | Type of amount codes (+) | Type of amount codes (-) | Calculation rule                                           |
|----------------------------------------------------------------------------------------|-------------------|------|---------------------|---------------------|-----------------|------------------|----------------|------------------|-------------------------------|--------------------------|--------------------------|------------------------------------------------------------|
|                                                                                        |                   |      |                     | P9999               |                 |                  |                |                  |                               | 04, 12                   |                          |                                                            |
| <b>Derivatives - Hedge accounting</b>                                                  | BN1               | 1056 |                     |                     |                 |                  |                |                  |                               |                          |                          | BN1(P1057 + P1058)                                         |
|                                                                                        | BN1               | 2056 |                     |                     |                 |                  |                |                  |                               |                          |                          | BN1(P2057 + P2058)                                         |
|                                                                                        | BN1               | 3056 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                            |
| <b>Micro hedging</b>                                                                   | BN1               | 1057 | AA                  | from P0701 to P0706 | ZFV, ZNT, ZUI   | *                | *              | *                | *                             | 03, 04, 10               |                          |                                                            |
|                                                                                        | BN1               | 2057 | AA                  | from P0701 to P0706 | ZFV, ZNT, ZUI   | *                | NOT (HRK)      | *                | *                             | 03, 04, 10               |                          |                                                            |
|                                                                                        | BN1               | 3057 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                            |
| <b>Macro hedging from credit risk</b>                                                  | BN1               | 1058 | AA                  | from P0701 to P0706 | ZFM             | *                | *              | *                | *                             | 03, 04, 10               |                          |                                                            |
|                                                                                        | BN1               | 2058 | AA                  | from P0701 to P0706 | ZFM             | *                | NOT (HRK)      | *                | *                             | 03, 04, 10               |                          |                                                            |
|                                                                                        | BN1               | 3058 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                            |
| <b>Fair value changes of the hedged items in portfolio hedge of interest rate risk</b> | BN1               | 1059 | AA                  | P0708               | *               | *                | *              | *                | *                             | 10                       |                          |                                                            |
|                                                                                        | BN1               | 2059 | AA                  | P0708               | *               | *                | NOT (HRK)      | *                | *                             | 10                       |                          |                                                            |
|                                                                                        | BN1               | 3059 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                            |
| <b>Reservations</b>                                                                    | BN1               | 1060 |                     |                     |                 |                  |                |                  |                               |                          |                          | BN1(P1061 + P1062 + P1063 + P1064 + P1065 + P1066 + P1067) |
|                                                                                        | BN1               | 2060 |                     |                     |                 |                  |                |                  |                               |                          |                          | BN1(P2061 + P2062 + P2063 + P2064 + P2065 + P2066 + P2067) |
|                                                                                        | BN1               | 3060 |                     |                     |                 |                  |                |                  |                               |                          |                          | BN1(P3061 + P3062 + P3063 + P3064 + P3065 + P3066 + P3067) |
| <b>Reservations for restructuring costs</b>                                            | BN1               | 1061 | AA                  | P0801               | XXX             | *                | *              | *                | *                             | 01                       |                          |                                                            |
|                                                                                        | BN1               | 2061 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                            |
|                                                                                        | BN1               | 3061 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                            |
| <b>Reservations for pending legal issues and tax litigation</b>                        | BN1               | 1062 | AA                  | P0802               | XXX             | *                | *              | *                | *                             | 01                       |                          |                                                            |
|                                                                                        | BN1               | 2062 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                            |
|                                                                                        | BN1               | 3062 |                     |                     |                 |                  |                |                  |                               |                          |                          |                                                            |
| <b>Reservations for staff costs</b>                                                    | BN1               | 1063 | AA                  | P0803               | XXX             | *                | *              | *                | *                             | 01                       |                          |                                                            |

| Table 1: Report BN1 – Balance sheet                                                    | Report short code | Tag  | Type of record code | Instrument codes | Portfolio codes | Risk group codes | Currency codes | Indexation codes | Capital characteristics codes | Type of amount codes (+) | Type of amount codes (-) | Calculation rule   |
|----------------------------------------------------------------------------------------|-------------------|------|---------------------|------------------|-----------------|------------------|----------------|------------------|-------------------------------|--------------------------|--------------------------|--------------------|
|                                                                                        | BN1               | 2063 |                     |                  |                 |                  |                |                  |                               |                          |                          |                    |
|                                                                                        | BN1               | 3063 |                     |                  |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Reservations for pensions and other post-employment defined benefit obligations</b> | BN1               | 1064 | AA                  | P0804            | XXX             | *                | *              | *                | *                             | 01                       |                          |                    |
|                                                                                        | BN1               | 2064 |                     |                  |                 |                  |                |                  |                               |                          |                          |                    |
|                                                                                        | BN1               | 3064 |                     |                  |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Reservations for off-balance sheet losses</b>                                       | BN1               | 1065 | AA                  | I*               | XXX             |                  | *              | *                | *                             | 05                       |                          |                    |
|                                                                                        | BN1               | 2065 | AA                  | I*               | XXX             |                  | NOT (HRK)      | *                | *                             | 05                       |                          |                    |
|                                                                                        | BN1               | 3065 | AA                  | I*               | XXX             | *                | HRK            | J, V             | *                             | 05                       |                          |                    |
| <b>Reservations for adverse contracts</b>                                              | BN1               | 1066 | AA                  | P0806            | XXX             | *                | *              | *                | *                             | 01                       |                          |                    |
|                                                                                        | BN1               | 2066 |                     |                  |                 |                  |                |                  |                               |                          |                          |                    |
|                                                                                        | BN1               | 3066 |                     |                  |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Other reservations</b>                                                              | BN1               | 1067 | AA                  | P0807            | XXX             | *                | *              | *                | *                             | 01                       |                          |                    |
|                                                                                        | BN1               | 2067 |                     |                  |                 |                  |                |                  |                               |                          |                          |                    |
|                                                                                        | BN1               | 3067 |                     |                  |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Tax liabilities</b>                                                                 | BN1               | 1068 |                     |                  |                 |                  |                |                  |                               |                          |                          | BN1(P1069 + P1070) |
|                                                                                        | BN1               | 2068 |                     |                  |                 |                  |                |                  |                               |                          |                          | BN1(P2069 + P2070) |
|                                                                                        | BN1               | 3068 |                     |                  |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Current tax liabilities</b>                                                         | BN1               | 1069 | AA                  | P0901            | XXX             | *                | *              | *                | *                             | 01                       |                          |                    |
|                                                                                        | BN1               | 2069 | AA                  | P0901            | XXX             | *                | NOT (HRK)      | *                | *                             | 01                       |                          |                    |
|                                                                                        | BN1               | 3069 |                     |                  |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Deferred tax liabilities</b>                                                        | BN1               | 1070 | AA                  | P0902            | XXX             | *                | *              | *                | *                             | 01                       |                          |                    |
|                                                                                        | BN1               | 2070 | AA                  | P0902            | XXX             | *                | NOT (HRK)      | *                | *                             | 01                       |                          |                    |
|                                                                                        | BN1               | 3070 |                     |                  |                 |                  |                |                  |                               |                          |                          |                    |
| <b>Liabilities included in disposal groups classified as held for sale</b>             | BN1               | 1071 | AA                  | P*               | GOP             | *                | *              | *                | *                             | 01, 02, 03, 04, 08, 12   | 07                       |                    |
|                                                                                        | BN1               | 2071 | AA                  | P*               | GOP             | *                | NOT (HRK)      | *                | *                             | 01, 02, 03,              | 07                       |                    |

| Table 1: Report BN1 – Balance sheet                       | Report short code | Tag  | Type of record code | Instrument codes                         | Portfolio codes | Risk group codes | Currency codes | Indexation codes | Capital characteristics codes | Type of amount codes (+) | Type of amount codes (-) | Calculation rule                                                   |
|-----------------------------------------------------------|-------------------|------|---------------------|------------------------------------------|-----------------|------------------|----------------|------------------|-------------------------------|--------------------------|--------------------------|--------------------------------------------------------------------|
|                                                           |                   |      |                     |                                          |                 |                  |                |                  |                               | 04, 08, 12               |                          |                                                                    |
|                                                           | BN1               | 3071 | AA                  | P*                                       | GOP             | *                | HRK            | J, V             | *                             | 01, 02, 03, 04, 08, 12   | 07                       |                                                                    |
| <b>Other liabilities</b>                                  | BN1               | 1072 | AA                  | P1002, P1003, P9993, P9996, P9997, P9999 | XXX             | *                | *              | *                | *                             | 01, 02, 03, 04, 12       |                          |                                                                    |
|                                                           | BN1               | 2072 | AA                  | P1002, P1003, P9993, P9996, P9997, P9999 | XXX             | *                | NOT (HRK)      | *                | *                             | 01, 02, 03, 04, 12       |                          |                                                                    |
|                                                           | BN1               | 3072 | AA                  | P1002, P1003, P9993, P9996, P9997, P9999 | XXX             | *                | HRK            | J, V             | *                             | 01, 02, 03, 04, 12       |                          |                                                                    |
| <b>TOTAL LIABILITIES</b>                                  | BN1               | 1073 |                     |                                          |                 |                  |                |                  |                               |                          |                          | BN1(P1041 + P1046 + P1056 + P1059 + P1060 + P1068 + P1071 + P1072) |
|                                                           | BN1               | 2073 |                     |                                          |                 |                  |                |                  |                               |                          |                          | BN1(P2041 + P2046 + P2056 + P2059 + P2060 + P2068 + P2071 + P2072) |
|                                                           | BN1               | 3073 |                     |                                          |                 |                  |                |                  |                               |                          |                          | BN1(P3041 + P3046 + P3056 + P3059 + P3060 + P3068 + P3071 + P3072) |
| <b>Capital</b>                                            | BN1               | 1074 |                     |                                          |                 |                  |                |                  |                               |                          |                          | BN1(P1075 + P1076 + P1077)                                         |
|                                                           | BN1               | 2074 |                     |                                          |                 |                  |                |                  |                               |                          |                          |                                                                    |
|                                                           | BN1               | 3074 |                     |                                          |                 |                  |                |                  |                               |                          |                          |                                                                    |
| <b>Paid up capital</b>                                    | BN1               | 1075 | AA                  | P1101, P1102, P1104, P1126               | *               | *                | *              | *                | *                             | 01                       |                          |                                                                    |
|                                                           | BN1               | 2075 |                     |                                          |                 |                  |                |                  |                               |                          |                          |                                                                    |
|                                                           | BN1               | 3075 |                     |                                          |                 |                  |                |                  |                               |                          |                          |                                                                    |
| <b>Share premium</b>                                      | BN1               | 1076 | AA                  | P1107                                    | *               | *                | *              | *                | *                             | 01                       |                          |                                                                    |
|                                                           | BN1               | 2076 |                     |                                          |                 |                  |                |                  |                               |                          |                          |                                                                    |
|                                                           | BN1               | 3076 |                     |                                          |                 |                  |                |                  |                               |                          |                          |                                                                    |
| <b>Equity component of compound financial instruments</b> | BN1               | 1077 | AA                  | P1103, P1105, P1106                      | *               | *                | *              | *                | *                             | 01                       |                          |                                                                    |
|                                                           | BN1               | 2077 |                     |                                          |                 |                  |                |                  |                               |                          |                          |                                                                    |
|                                                           | BN1               | 3077 |                     |                                          |                 |                  |                |                  |                               |                          |                          |                                                                    |
| <b>Revaluation reserves</b>                               | BN1               | 1078 |                     |                                          |                 |                  |                |                  |                               |                          |                          | BN1(P1079 + P1080 + P1081 + P1082 + P1083 + P1084 + P1085 + P1086) |
|                                                           | BN1               | 2078 |                     |                                          |                 |                  |                |                  |                               |                          |                          |                                                                    |
|                                                           | BN1               | 3078 |                     |                                          |                 |                  |                |                  |                               |                          |                          |                                                                    |

| Table 1: Report BN1 – Balance sheet                                                            | Report short code | Tag  | Type of record code | Instrument codes | Portfolio codes | Risk group codes | Currency codes | Indexation codes | Capital characteristics codes | Type of amount codes (+) | Type of amount codes (-) | Calculation rule |
|------------------------------------------------------------------------------------------------|-------------------|------|---------------------|------------------|-----------------|------------------|----------------|------------------|-------------------------------|--------------------------|--------------------------|------------------|
| <b>Non-realised profit (loss) from value adjustments - Financial assets available for sale</b> | BN1               | 1079 | AA                  | P1118            | *               | *                | *              | *                | *                             | 01                       |                          |                  |
|                                                                                                | BN1               | 2079 |                     |                  |                 |                  |                |                  |                               |                          |                          |                  |
|                                                                                                | BN1               | 3079 |                     |                  |                 |                  |                |                  |                               |                          |                          |                  |
| <b>Foreign currency translation</b>                                                            | BN1               | 1080 | AA                  | P1119            | *               | *                | *              | *                | *                             | 01                       |                          |                  |
|                                                                                                | BN1               | 2080 |                     |                  |                 |                  |                |                  |                               |                          |                          |                  |
|                                                                                                | BN1               | 3080 |                     |                  |                 |                  |                |                  |                               |                          |                          |                  |
| <b>Tangible asset reserves</b>                                                                 | BN1               | 1081 | AA                  | P1120            | *               | *                | *              | *                | *                             | 01                       |                          |                  |
|                                                                                                | BN1               | 2081 |                     |                  |                 |                  |                |                  |                               |                          |                          |                  |
|                                                                                                | BN1               | 3081 |                     |                  |                 |                  |                |                  |                               |                          |                          |                  |
| <b>Intangible asset reserves</b>                                                               | BN1               | 1082 | AA                  | P1121            | *               | *                | *              | *                | *                             | 01                       |                          |                  |
|                                                                                                | BN1               | 2082 |                     |                  |                 |                  |                |                  |                               |                          |                          |                  |
|                                                                                                | BN1               | 3082 |                     |                  |                 |                  |                |                  |                               |                          |                          |                  |
| <b>Hedge of net investments in foreign operations [effective portion]</b>                      | BN1               | 1083 | AA                  | P1122            | *               | *                | *              | *                | *                             | 01                       |                          |                  |
|                                                                                                | BN1               | 2083 |                     |                  |                 |                  |                |                  |                               |                          |                          |                  |
|                                                                                                | BN1               | 3083 |                     |                  |                 |                  |                |                  |                               |                          |                          |                  |
| <b>Hedging derivatives. Cash flow hedges [effective portion]</b>                               | BN1               | 1084 | AA                  | P1123            | *               | *                | *              | *                | *                             | 01                       |                          |                  |
|                                                                                                | BN1               | 2084 |                     |                  |                 |                  |                |                  |                               |                          |                          |                  |
|                                                                                                | BN1               | 3084 |                     |                  |                 |                  |                |                  |                               |                          |                          |                  |
| <b>Non-current assets and disposal groups classified as held for sale</b>                      | BN1               | 1085 | AA                  | P1124            | *               | *                | *              | *                | *                             | 01                       |                          |                  |
|                                                                                                | BN1               | 2085 |                     |                  |                 |                  |                |                  |                               |                          |                          |                  |
|                                                                                                | BN1               | 3085 |                     |                  |                 |                  |                |                  |                               |                          |                          |                  |
| <b>Other revaluation reserves</b>                                                              | BN1               | 1086 | AA                  | P1125            | *               | *                | *              | *                | *                             | 01                       |                          |                  |
|                                                                                                | BN1               | 2086 |                     |                  |                 |                  |                |                  |                               |                          |                          |                  |
|                                                                                                | BN1               | 3086 |                     |                  |                 |                  |                |                  |                               |                          |                          |                  |

| Table 1: Report BN1 – Balance sheet                             | Report short code | Tag  | Type of record code | Instrument codes           | Portfolio codes | Risk group codes | Currency codes | Indexation codes | Capital characteristics codes | Type of amount codes (+) | Type of amount codes (-) | Calculation rule           |
|-----------------------------------------------------------------|-------------------|------|---------------------|----------------------------|-----------------|------------------|----------------|------------------|-------------------------------|--------------------------|--------------------------|----------------------------|
| <b>Reserves</b>                                                 | BN1               | 1087 |                     |                            |                 |                  |                |                  |                               |                          |                          | BN1(P1088 + P1089 + P1090) |
|                                                                 | BN1               | 2087 |                     |                            |                 |                  |                |                  |                               |                          |                          | BN1(P2088 + P2089 + P2090) |
|                                                                 | BN1               | 3087 |                     |                            |                 |                  |                |                  |                               |                          |                          | BN1(P3088 + P3089 + P3090) |
| <b>Law reserves</b>                                             | BN1               | 1088 | AA                  | P1112                      | *               | *                | *              | *                | *                             | 01                       |                          |                            |
|                                                                 | BN1               | 2088 |                     |                            |                 |                  |                |                  |                               |                          |                          |                            |
|                                                                 | BN1               | 3088 |                     |                            |                 |                  |                |                  |                               |                          |                          |                            |
| <b>Other capital reserves</b>                                   | BN1               | 1089 | AA                  | P1113, P1114, P1116, P9992 | *               | *                | *              | *                | *                             | 01                       |                          |                            |
|                                                                 | BN1               | 2089 |                     |                            |                 |                  |                |                  |                               |                          |                          |                            |
|                                                                 | BN1               | 3089 |                     |                            |                 |                  |                |                  |                               |                          |                          |                            |
| <b>Capital profit (loss) gained by sale/buy back own shares</b> | BN1               | 1090 | AA                  | P1108                      | *               | *                | *              | *                | *                             | 01                       |                          |                            |
|                                                                 | BN1               | 2090 |                     |                            |                 |                  |                |                  |                               |                          |                          |                            |
|                                                                 | BN1               | 3090 |                     |                            |                 |                  |                |                  |                               |                          |                          |                            |
| <b>Own shares</b>                                               | BN1               | 1091 | AA                  | P1104, P1126               | *               | *                | *              | *                | *                             | 05                       |                          |                            |
|                                                                 | BN1               | 2091 |                     |                            |                 |                  |                |                  |                               |                          |                          |                            |
|                                                                 | BN1               | 3091 |                     |                            |                 |                  |                |                  |                               |                          |                          |                            |
| <b>Retained profit (loss)</b>                                   | BN1               | 1092 | AA                  | P1109                      | *               | *                | *              | *                | *                             | 01                       |                          |                            |
|                                                                 | BN1               | 2092 |                     |                            |                 |                  |                |                  |                               |                          |                          |                            |
|                                                                 | BN1               | 3092 |                     |                            |                 |                  |                |                  |                               |                          |                          |                            |
| <b>Profit/loss previous year</b>                                | BN1               | 1093 | AA                  | P1110                      | *               | *                | *              | *                | *                             | 01                       |                          |                            |
|                                                                 | BN1               | 2093 |                     |                            |                 |                  |                |                  |                               |                          |                          |                            |
|                                                                 | BN1               | 3093 |                     |                            |                 |                  |                |                  |                               |                          |                          |                            |
| <b>Profit/loss current year</b>                                 | BN1               | 1094 | AA                  | P1111                      | *               | *                | *              | *                | *                             | 01                       |                          |                            |
|                                                                 | BN1               | 1094 | AA                  | P1117                      | *               | *                | *              | *                | *                             |                          | 01                       |                            |
|                                                                 | BN1               | 2094 |                     |                            |                 |                  |                |                  |                               |                          |                          |                            |
|                                                                 | BN1               | 3094 |                     |                            |                 |                  |                |                  |                               |                          |                          |                            |
| <b>Majority share owner capital (only for consolidation)</b>    | BN1               | 1095 |                     |                            |                 |                  |                |                  |                               |                          |                          | BN1(P1097 - P1096)         |
|                                                                 | BN1               | 2095 |                     |                            |                 |                  |                |                  |                               |                          |                          |                            |

| Table 1: Report BN1 – Balance sheet                   | Report short code | Tag  | Type of record code | Instrument codes | Portfolio codes | Risk group codes | Currency codes | Indexation codes | Capital characteristics codes | Type of amount codes (+) | Type of amount codes (-) | Calculation rule                                                   |
|-------------------------------------------------------|-------------------|------|---------------------|------------------|-----------------|------------------|----------------|------------------|-------------------------------|--------------------------|--------------------------|--------------------------------------------------------------------|
|                                                       | BN1               | 3095 |                     |                  |                 |                  |                |                  |                               |                          |                          |                                                                    |
| Minority share owner capital (only for consolidation) | BN1               | 1096 | AA                  | P1115            | *               | *                | *              | *                | *                             | 01                       |                          |                                                                    |
|                                                       | BN1               | 2096 |                     |                  |                 |                  |                |                  |                               |                          |                          |                                                                    |
|                                                       | BN1               | 3096 |                     |                  |                 |                  |                |                  |                               |                          |                          |                                                                    |
| TOTAL CAPITAL                                         | BN1               | 1097 |                     |                  |                 |                  |                |                  |                               |                          |                          | BN1(P1074 + P1078 + P1087 + P1092 + P1093 + P1094 + P1096 - P1091) |
|                                                       | BN1               | 2097 |                     |                  |                 |                  |                |                  |                               |                          |                          |                                                                    |
| TOTAL LIABILITIES AND CAPITAL                         | BN1               | 3097 |                     |                  |                 |                  |                |                  |                               |                          |                          |                                                                    |
|                                                       | BN1               | 1098 |                     |                  |                 |                  |                |                  |                               |                          |                          | BN1(P1073 + P1097)                                                 |



### Annex 3

#### ECB KPIs for nominal interest rate on the outstanding amount

|                                                                   | KPI number | Instrument codes                                  | Type of record codes | Consolidation/ Preliminary or revised codes | Sector ESA 2010 codes                 | Currency group codes | Original maturity | Marketability codes | Risk group codes | Outstanding amount    | Average weighted NKS on the outstanding amount  |
|-------------------------------------------------------------------|------------|---------------------------------------------------|----------------------|---------------------------------------------|---------------------------------------|----------------------|-------------------|---------------------|------------------|-----------------------|-------------------------------------------------|
|                                                                   |            | AA, KS                                            | AA, KS               | AA, KS                                      | AA, KS                                | AA, KS               | AA, KS            | AA                  | AA, KS           | AA                    | AA, KS                                          |
| <b>Liabilities</b>                                                |            |                                                   |                      |                                             |                                       |                      |                   |                     |                  |                       |                                                 |
| <b>Deposits</b>                                                   |            |                                                   |                      |                                             |                                       |                      |                   |                     |                  |                       |                                                 |
| <b>Households - Deposits with agreed maturity</b>                 |            | P0203, P0207, P0210 do P0213, P0506               |                      |                                             |                                       |                      |                   |                     |                  | K11+K12               | $(K11*L11+K12*L12)/(K11+K12)$                   |
| <b>up to 2 years</b>                                              | 1          | P0203, P0207, P0210 do P0213, P0506               | AA, KS               | NP                                          | 14, 15002, 15003                      | HRK, EUR             | ≤24               |                     |                  | $\sum(1+2+12)^j$      | $\sum((1+2+12)^j*44i)/\sum(1+2+12)^j$           |
| <b>over 2 years</b>                                               | 2          | P0203, P0210 do P0213, P0506                      | AA, KS               | NP                                          | 14, 15002, 15003                      | HRK, EUR             | >24               |                     |                  | $\sum(1+2+12)^j$      | $\sum((1+2+12)^j*44i)/\sum(1+2+12)^j$           |
| <b>Non-financial corporations - Deposits with agreed maturity</b> |            | P0203, P0207, P0210 do P0213, P0506               |                      |                                             |                                       |                      |                   |                     |                  | K14+K15               | $(K14*L14+K15*L15)/(K14+K15)$                   |
| <b>up to 2 years</b>                                              | 3          | P0203, P0207, P0210 do P0213, P0506               | AA, KS               | NP                                          | 11001, 11002, 11003                   | HRK, EUR             | ≤24               |                     |                  | $\sum(1+2+12)^j$      | $\sum((1+2+12)^j*44i)/\sum(1+2+12)^j$           |
| <b>over 2 years</b>                                               | 4          | P0203, P0210 do P0213, P0506                      | AA, KS               | NP                                          | 11001, 11002, 11003                   | HRK, EUR             | >24               |                     |                  | $\sum(1+2+12)^j$      | $\sum((1+2+12)^j*44i)/\sum(1+2+12)^j$           |
| <b>Loans on repo basis</b>                                        | 5          | P0209                                             | AA, KS               | NP                                          | 11001, 11002, 11003, 14, 15002, 15003 | HRK, EUR             | *                 |                     |                  | $\sum(1+2+12)^j$      | $\sum((1+2+12)^j*44i)/\sum(1+2+12)^j$           |
| <b>Assets</b>                                                     |            |                                                   |                      |                                             |                                       |                      |                   |                     |                  |                       |                                                 |
| <b>Loans</b>                                                      |            |                                                   |                      |                                             |                                       |                      |                   |                     |                  |                       |                                                 |
| <b>Households</b>                                                 |            | A0207 do A0230, A0232, A0233, A0305, A0306, A0701 |                      |                                             |                                       |                      |                   |                     |                  | K20+K24               | $(K20*L20+K24*L24)/(K20+K24)$                   |
| <b>Housing loans</b>                                              |            | A0215                                             |                      |                                             |                                       |                      |                   |                     |                  | K21+K22+K23           | $(K21*L21+K22*L22+K23*L23)/(K21+K22+K23)$       |
| <b>up to 1 year</b>                                               | 6          | A0215                                             | AA, KS               | NP                                          | 14, 15002, 15003                      | HRK, EUR             | ≤12               | N, U or blank*      | AA, A9, 00       | $\sum(1+2-7+10+12)^j$ | $\sum((1+2-7+10+12)^j*44i)/\sum(1+2-7+10+12)^j$ |
| <b>Between 1 and 5 years</b>                                      | 7          | A0215                                             | AA, KS               | NP                                          | 14, 15002, 15003                      | HRK, EUR             | 12<x≤60           | N, U or blank*      | AA, A9, 00       | $\sum(1+2-7+10+12)^j$ | $\sum((1+2-7+10+12)^j*44i)/\sum(1+2-7+10+12)^j$ |
| <b>over 5 years</b>                                               | 8          | A0215                                             | AA, KS               | NP                                          | 14, 15002, 15003                      | HRK, EUR             | >60               | N, U or blank*      | AA, A9, 00       | $\sum(1+2-7+10+12)^j$ | $\sum((1+2-7+10+12)^j*44i)/\sum(1+2-7+10+12)^j$ |
| <b>Consumer and other loans</b>                                   |            | A0207 do A0214, A0216 do A0230, A0232, A0233,     |                      |                                             |                                       |                      |                   |                     |                  | K25+K26+K27           | $(K25*L25+K26*L26+K27*L27)/(K25+K26+K27)$       |

|                                                                                                       | KPI number | Instrument codes                                                  | Type of record codes | Consolidation/ Preliminary or revised codes | Sector ESA 2010 codes | Currency group codes | Original maturity | Marketability codes | Risk group codes | Outstanding amount    | Average weighted NKS on the outstanding amount            |
|-------------------------------------------------------------------------------------------------------|------------|-------------------------------------------------------------------|----------------------|---------------------------------------------|-----------------------|----------------------|-------------------|---------------------|------------------|-----------------------|-----------------------------------------------------------|
|                                                                                                       |            | A0305, A0306, A0701                                               |                      |                                             |                       |                      |                   |                     |                  |                       |                                                           |
| <b>up to 1 year</b>                                                                                   | 9          | A0207 do A0214, A0216 do A0230, A0232, A0233, A0305, A0306, A0701 | AA, KS               | NP                                          | 14, 15002, 15003      | HRK, EUR             | ≤12               | N, U or blank*      | AA, A9, 00       | $\sum(1+2-7+10+12)^j$ | $\sum((1+2-7+10+12)^j * 44i) / \sum(1+2-7+10+12)^j$       |
| <b>between 1 and 5 years</b>                                                                          | 10         | A0208 do A0214, A0216 do A0230, A0232, A0233, A0305, A0306        | AA, KS               | NP                                          | 14, 15002, 15003      | HRK, EUR             | 12<x≤60           | N, U or blank*      | AA, A9, 00       | $\sum(1+2-7+10+12)^j$ | $\sum((1+2-7+10+12)^j * 44i) / \sum(1+2-7+10+12)^j$       |
| <b>over 5 years</b>                                                                                   | 11         | A0208 do A0214, A0216 do A0230, A0232, A0233, A0305, A0306        | AA, KS               | NP                                          | 14, 15002, 15003      | HRK, EUR             | >60               | N, U or blank*      | AA, A9, 00       | $\sum(1+2-7+10+12)^j$ | $\sum((1+2-7+10+12)^j * 44i) / \sum(1+2-7+10+12)^j$       |
| <b>over 1 year</b>                                                                                    | 15         | A0207 do A0230, A0232, A0233, A0305, A0306, A0701                 | AA, KS               | NP                                          | 14, 15002, 15003      | HRK, EUR             | >12               | N, U or blank*      | AA, A9, 00       | $\sum(1+2-7+10+12)^j$ | $\sum((1+2-7+10+12)^j * 44i) / \sum(1+2-7+10+12)^j$       |
| <b>over 1 year with remaining maturity up to 1 year</b>                                               | 16         | A0236                                                             | KS                   | NP                                          | 14, 15002, 15003      | HRK, EUR             |                   | N, U or blank*      | AA, A9, 00       | $\sum 41i$            | $\sum(41i * 44i) / \sum 41i$                              |
| <b>over 1 year with remaining maturity over 1 year and variable interest rate in next 12 months</b>   | 17         | A0237                                                             | KS                   | NP                                          | 14, 15002, 15003      | HRK, EUR             |                   | N, U or blank*      | AA, A9, 00       | $\sum 41i$            | $\sum(41i * 44i) / \sum 41i$                              |
| <b>over 2 years</b>                                                                                   | 18         | A0207 do A0230, A0232, A0233, A0305, A0306, A0701                 | AA, KS               | NP                                          | 14, 15002, 15003      | HRK, EUR             | >24               | N, U or blank*      | AA, A9, 00       | $\sum(1+2-7+10+12)^j$ | $\sum((1+2-7+10+12)^j * 44i) / \sum(1+2-7+10+12)^j$       |
| <b>over 2 years with remaining maturity up to 2 years</b>                                             | 19         | A0238                                                             | KS                   | NP                                          | 14, 15002, 15003      | HRK, EUR             |                   | N, U or blank*      | AA, A9, 00       | $\sum 41i$            | $\sum(41i * 44i) / \sum 41i$                              |
| <b>over 2 years with remaining maturity over 2 years and variable interest rate in next 24 months</b> | 20         | A0239                                                             | KS                   | NP                                          | 14, 15002, 15003      | HRK, EUR             |                   | N, U or blank*      | AA, A9, 00       | $\sum 41i$            | $\sum(41i * 44i) / \sum 41i$                              |
| <b>Non-financial corporations</b>                                                                     |            | A0207 do A0230, A0232, A0233, A0305, A0306, A0701                 |                      |                                             |                       |                      |                   |                     |                  | K35+K36+K37           | $(K35 * L35 + K36 * L36 + K37 * L37) / (K35 + K36 + K37)$ |
| <b>up to 1 year</b>                                                                                   | 12         | A0207 do A0230, A0232, A0233, A0305, A0306, A0701                 | AA, KS               | NP                                          | 11001, 11002, 11003   | HRK, EUR             | ≤12               | N, U or blank*      | AA, A9, 00       | $\sum(1+2-7+10+12)^j$ | $\sum((1+2-7+10+12)^j * 44i) / \sum(1+2-7+10+12)^j$       |
| <b>between 1 and 5 years</b>                                                                          | 13         | A0208 do A0230, A0232, A0233, A0305, A0306                        | AA, KS               | NP                                          | 11001, 11002, 11003   | HRK, EUR             | 12<x≤60           | N, U or blank*      | AA, A9, 00       | $\sum(1+2-7+10+12)^j$ | $\sum((1+2-7+10+12)^j * 44i) / \sum(1+2-7+10+12)^j$       |

|                                                                                                       | KPI number | Instrument codes                                  | Type of record codes | Consolidation/<br>Preliminary or revised codes | Sector ESA 2010 codes | Currency group codes | Original maturity | Marketability codes | Risk group codes | Outstanding amount    | Average weighted NKS on the outstanding amount            |
|-------------------------------------------------------------------------------------------------------|------------|---------------------------------------------------|----------------------|------------------------------------------------|-----------------------|----------------------|-------------------|---------------------|------------------|-----------------------|-----------------------------------------------------------|
| <b>over 5 years</b>                                                                                   | 14         | A0208 do A0230, A0232, A0233, A0305, A0306        | AA, KS               | NP                                             | 11001, 11002, 11003   | HRK, EUR             | >60               | N, U or blank*      | AA, A9, 00       | $\sum(1+2-7+10+12)^i$ | $\frac{\sum((1+2-7+10+12)^i * 44i)}{\sum(1+2-7+10+12)^i}$ |
| <b>over 1 year</b>                                                                                    | 21         | A0207 do A0230, A0232, A0233, A0305, A0306, A0701 | AA, KS               | NP                                             | 11001, 11002, 11003   | HRK, EUR             | >12               | N, U or blank*      | AA, A9, 00       | $\sum(1+2-7+10+12)^i$ | $\frac{\sum((1+2-7+10+12)^i * 44i)}{\sum(1+2-7+10+12)^i}$ |
| <b>over 1 year with remaining maturity up to 1 year</b>                                               | 22         | A0236                                             | KS                   | NP                                             | 11001, 11002, 11003   | HRK, EUR             |                   | N, U or blank*      | AA, A9, 00       | $\sum 41i$            | $\frac{\sum(41i * 44i)}{\sum 41i}$                        |
| <b>over 1 year with remaining maturity over 1 year and variable interest rate in next 12 months</b>   | 23         | A0237                                             | KS                   | NP                                             | 11001, 11002, 11003   | HRK, EUR             |                   | N, U or blank*      | AA, A9, 00       | $\sum 41i$            | $\frac{\sum(41i * 44i)}{\sum 41i}$                        |
| <b>over 2 years</b>                                                                                   | 24         | A0207 do A0230, A0232, A0233, A0305, A0306, A0701 | AA, KS               | NP                                             | 11001, 11002, 11003   | HRK, EUR             | >24               | N, U or blank*      | AA, A9, 00       | $\sum(1+2-7+10+12)^i$ | $\frac{\sum((1+2-7+10+12)^i * 44i)}{\sum(1+2-7+10+12)^i}$ |
| <b>over 2 years with remaining maturity up to 2 years</b>                                             | 25         | A0238                                             | KS                   | NP                                             | 11001, 11002, 11003   | HRK, EUR             |                   | N, U or blank*      | AA, A9, 00       | $\sum 41i$            | $\frac{\sum(41i * 44i)}{\sum 41i}$                        |
| <b>over 2 years with remaining maturity over 2 years and variable interest rate in next 24 months</b> | 26         | A0239                                             | KS                   | NP                                             | 11001, 11002, 11003   | HRK, EUR             |                   | N, U or blank*      | AA, A9, 00       | $\sum 41i$            | $\frac{\sum(41i * 44i)}{\sum 41i}$                        |

## Annex 4: Code lists

### Type of record codes and description

| Type of record code | Type of record code description                                                                |
|---------------------|------------------------------------------------------------------------------------------------|
| AA                  | Balance sheet and off-balance sheet items                                                      |
| AB                  | Changes in stocks (from AA)                                                                    |
| AS                  | Cumulative changes of write-downs and reservations (from AA)                                   |
| AP                  | Cumulative changes of write-downs and reservations (from AF and AN)                            |
| PO                  | Lists of groups, natural persons and related legal persons                                     |
| AF                  | Balance sheet items for natural person counterparties                                          |
| AN                  | Balance sheet items for non-resident counterparties                                            |
| AV                  | Exchange rate-induced credit risk, natural person residents and non-residents (from AF and AN) |
| AW                  | Exchange rate-induced credit risk (from AA)                                                    |
| AE                  | Overdue receivables                                                                            |
| AK                  | Opportunity of interest rate reset                                                             |
| AD                  | Balance sheet and off-balance sheet items remaining maturity                                   |
| AU                  | Investments in capital of other legal persons                                                  |
| AM                  | Tangible assets                                                                                |
| IZ                  | Providers of collateral and guarantees                                                         |
| OI                  | Other information                                                                              |
| KS                  | MFI interest rates                                                                             |
| RA                  | Profit and loss accounts                                                                       |
| AH                  | Sold placements by placement buyers                                                            |

### Consolidation report codes and description

| Consolidation report code | Consolidation report code description |
|---------------------------|---------------------------------------|
| K                         | Consolidated report                   |
| N                         | Non-consolidated report               |
| D                         | Non-consolidated ten-day report       |

### Preliminary report/report after external auditing codes and description

| Preliminary report/report after external auditing code | Preliminary report/report after external auditing code description |
|--------------------------------------------------------|--------------------------------------------------------------------|
| R                                                      | Revised report                                                     |
| P                                                      | Non-revised report                                                 |
| 1                                                      | Non-revised ten-day report (10th day of the month)                 |
| 2                                                      | Non-revised ten-day report (20th day of the month)                 |

## County codes and description

| County code | County code description           |
|-------------|-----------------------------------|
| 01          | Zagreb County                     |
| 02          | County of Krapina-Zagorje         |
| 03          | County of Sisak-Moslavina         |
| 04          | Karlovac County                   |
| 05          | Varaždin County                   |
| 06          | County of Koprivnica-Križevci     |
| 07          | County of Bjelovar-Bilogora       |
| 08          | County of Primorje-Gorski kotar   |
| 09          | County of Lika-Senj               |
| 10          | County of Virovitica-Podravina    |
| 11          | County of Požega-Slavonija        |
| 12          | County of Slavonski brod-Posavina |
| 13          | Zadar County                      |
| 14          | County of Osijek-Baranja          |
| 15          | County of Šibenik-Knin            |
| 16          | County of Vukovar-Srijem          |
| 17          | County of Split-Dalmacija         |
| 18          | Istra County                      |
| 19          | County of Dubrovnik-Neretva       |
| 20          | Međimurje County                  |
| 21          | City of Zagreb                    |
| 00          | Not applicable                    |

## Relation with reporting agent codes and description

| Relation with reporting agent code | Relation with the reporting agent code description                           |
|------------------------------------|------------------------------------------------------------------------------|
| N                                  | Non-related                                                                  |
| B                                  | Reporting agent is also a counterparty                                       |
| P                                  | Primary relation (mother-daughter) + the percentage of ownership (both ways) |
| S                                  | Secondary relation (sisters) + the percentage of ownership (both ways)       |

Note: CNB BIRD example: P1000000001000000000, primary relation, reporting agent is 100% owned by a counterparty, reporting agent does not have its own shares.

## Instrument codes and description

| Instrument code | Instrument code description          |
|-----------------|--------------------------------------|
| A0101           | Cash                                 |
| A0102           | Checks and other payment instruments |
| A0201           | Settlement accounts at the CNB       |
| A0202           | Other deposits at the CNB            |
| A0203           | Statutory reserve requirements       |
| A0204           | Marginal reserve requirements        |
| A0205           | Special reserve requirements         |
| A0206           | Deposits                             |
| A0207           | Overnight loans                      |

| Instrument code | Instrument code description                                                                                                                                                    |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| A0208           | Loans for payments on the basis of guarantees and other commitments                                                                                                            |
| A0209           | Reverse repo loans                                                                                                                                                             |
| A0210           | Shares in syndicated loans                                                                                                                                                     |
| A0212           | Financial leasing                                                                                                                                                              |
| A0213           | Consumer loans                                                                                                                                                                 |
| A0214           | Education loans                                                                                                                                                                |
| A0215           | Housing loans                                                                                                                                                                  |
| A0216           | Mortgage loans                                                                                                                                                                 |
| A0217           | Car loans                                                                                                                                                                      |
| A0218           | Credit card loans                                                                                                                                                              |
| A0219           | Credit card loans guaranteed by credit card company                                                                                                                            |
| A0222           | Margin loans                                                                                                                                                                   |
| A0223           | Lombard loans                                                                                                                                                                  |
| A0224           | Loans for working capital                                                                                                                                                      |
| A0225           | Construction loans                                                                                                                                                             |
| A0226           | Loans for agriculture                                                                                                                                                          |
| A0227           | Loans for tourism                                                                                                                                                              |
| A0228           | Investment loans                                                                                                                                                               |
| A0229           | Loans for export financing                                                                                                                                                     |
| A0230           | Other loans                                                                                                                                                                    |
| A0231           | Deposits within the notice period                                                                                                                                              |
| A0232           | Cash loans against no pledge                                                                                                                                                   |
| A0233           | Cash loans against a pledge                                                                                                                                                    |
| A0234           | Advances for tangible assets                                                                                                                                                   |
| A0235           | Revolving loans                                                                                                                                                                |
| A0236           | Loans indicator, applicable for loans with original maturity greater than one year and remaining maturity less than one year                                                   |
| A0237           | Loans indicator, applicable for loans with original maturity greater than one year and remaining maturity greater than one year and variable interest rate in next 12 months   |
| A0238           | Loans indicator, applicable for loans with original maturity greater than two years and remaining maturity less than two years                                                 |
| A0239           | Loans indicator, applicable for loans with original maturity greater than two years and remaining maturity greater than two years and variable interest rate in next 24 months |
| A0301           | Bonds                                                                                                                                                                          |
| A0302           | Commercial papers                                                                                                                                                              |
| A0303           | CNB bills and treasury bills                                                                                                                                                   |
| A0304           | Deposit certificates                                                                                                                                                           |
| A0305           | Factoring                                                                                                                                                                      |
| A0306           | Forfaiting                                                                                                                                                                     |
| A0307           | Bills of exchange                                                                                                                                                              |
| A0308           | Required central bank bills                                                                                                                                                    |
| A0401           | Regular shares                                                                                                                                                                 |
| A0402           | Preferred shares                                                                                                                                                               |
| A0403           | Shares in open-end investment funds                                                                                                                                            |
| A0404           | Equity holdings in non-equity companies                                                                                                                                        |
| A0301           | Bonds                                                                                                                                                                          |

| Instrument code | Instrument code description                                   |
|-----------------|---------------------------------------------------------------|
| A0501           | Options                                                       |
| A0502           | Swaps                                                         |
| A0503           | Forwards                                                      |
| A0504           | Futures                                                       |
| A0505           | Warrants                                                      |
| A0506           | Other derivatives                                             |
| A0507           | Fair value changes of the macro hedged items                  |
| A0601           | Current tax assets                                            |
| A0602           | Deferred tax assets                                           |
| A0603           | Receivables based on non-interest income (fees)               |
| A0701           | Deferred payment card claims (charge card)                    |
| A0702           | Paid insurance premiums                                       |
| A0703           | Precious metals - gold, platinum, etc.                        |
| A0802           | Land - taken over                                             |
| A0803           | Property - taken over                                         |
| A0804           | Plant - taken over                                            |
| A0805           | Equipment - taken over                                        |
| A0806           | Property (building, flats) - taken over                       |
| A0807           | Other tangible assets - taken over                            |
| A0902           | Investments in land                                           |
| A0903           | Investments in properties                                     |
| A0904           | Investments in plant                                          |
| A0905           | Investments in equipment                                      |
| A0906           | Investments in properties (buildings, flats)                  |
| A0907           | Investment in other tangible assets                           |
| A1002           | Goodwill                                                      |
| A1003           | Software                                                      |
| A1004           | Investment in tangible assets under operating leases          |
| A1005           | Investments to improve tangible assets under operating leases |
| A1006           | Other intangible assets                                       |
| A9992           | Deferred costs                                                |
| A9993           | Claims for registered, yet unpaid capital                     |
| A9996           | Flowing items                                                 |
| A9997           | Restricted items                                              |
| A9998           | Unpaid due receivables from derivatives                       |
| A9999           | Other receivables                                             |
| P0201           | Transaction accounts                                          |
| P0202           | Savings deposits                                              |
| P0203           | Time deposits                                                 |
| P0204           | Deposits within notice period                                 |
| P0205           | Restricted deposits                                           |
| P0206           | Blocked deposits                                              |
| P0207           | Loans based on the overdrafts on the transactional accounts   |
| P0208           | Received overnight loans                                      |
| P0209           | Reverse repo loans                                            |
| P0210           | Financial leasing                                             |

| Instrument code | Instrument code description                                                     |
|-----------------|---------------------------------------------------------------------------------|
| P0211           | Received syndicated loans                                                       |
| P0212           | Other received loans                                                            |
| P0213           | Margin deposits                                                                 |
| P0301           | Hardware based e-money                                                          |
| P0302           | Software based e-money                                                          |
| P0501           | Bonds                                                                           |
| P0502           | Commercial papers                                                               |
| P0505           | CNB bills                                                                       |
| P0506           | Mandatory CNB bills                                                             |
| P0601           | Short selling                                                                   |
| P0602           | Liabilities fees and provisions                                                 |
| P0701           | Options                                                                         |
| P0702           | Swaps                                                                           |
| P0703           | Forwards                                                                        |
| P0704           | Futures                                                                         |
| P0705           | Warrants                                                                        |
| P0706           | Other derivatives                                                               |
| P0708           | Fair value changes of the hedged items                                          |
| P0801           | Provisions for restructuring costs                                              |
| P0802           | Provisions for litigation costs                                                 |
| P0803           | Provisions for liabilities towards employees                                    |
| P0804           | Provisions for pensions and other liabilities to former employees               |
| P0806           | Provisions for onerous contracts                                                |
| P0807           | Other provisions                                                                |
| P0901           | Current tax liabilities                                                         |
| P0902           | Deferred tax liabilities                                                        |
| P1002           | Liabilities based on published dividends                                        |
| P1003           | Liabilities towards employees                                                   |
| P1101           | Share capital - regular shares                                                  |
| P1102           | Share capital - preferred shares                                                |
| P1103           | Registered, yet unpaid capital                                                  |
| P1104           | Capital - own regular shares                                                    |
| P1105           | Equity component of compound financial instruments                              |
| P1106           | Other capital instruments                                                       |
| P1107           | Capital gain on share issue (capital reserve)                                   |
| P1108           | Capital gain (loss) on the purchase and sale of own shares                      |
| P1109           | Retained earnings                                                               |
| P1110           | Profit/loss for the previous year                                               |
| P1111           | Profit/loss for the current year                                                |
| P1112           | Legal reserves                                                                  |
| P1113           | Statutory and other capital reserves                                            |
| P1114           | Reserves for general banking risks                                              |
| P1116           | Translation difference                                                          |
| P1115           | Capital held by minority owners (only in case of consolidation)                 |
| P1117           | Dividends paid in current year                                                  |
| P1118           | Unrealised loss/gain on value adjustment of available-for-sale financial assets |



| Instrument code | Instrument code description                                                                                                   |
|-----------------|-------------------------------------------------------------------------------------------------------------------------------|
| P1119           | Net foreign currency translation                                                                                              |
| P1120           | Reserves arising from revaluation of tangible assets                                                                          |
| P1121           | Reserves arising from revaluation of intangible assets                                                                        |
| P1122           | Reserves arising from hedge of net investments in foreign operations (effective portion)                                      |
| P1123           | Reserves arising from cash flow hedges (effective portion)                                                                    |
| P1124           | Reserves arising from non-current assets or disposal groups held for sale                                                     |
| P1125           | Other revaluation reserves                                                                                                    |
| P1126           | Capital - own preferred shares                                                                                                |
| P9992           | Deferred tax on capital                                                                                                       |
| P9993           | Deferred income                                                                                                               |
| P9996           | Flowing items                                                                                                                 |
| P9997           | Restricted items                                                                                                              |
| P9998           | Liabilities due derivative financial instruments                                                                              |
| P9999           | Other liabilities                                                                                                             |
| I0101           | Warranties                                                                                                                    |
| I0102           | Document issued by a credit institution that guarantees the payment of a given amount on the basis of a guarantee or a waiver |
| I0103           | Bills of exchange guarantees                                                                                                  |
| I0104           | Revolving loans                                                                                                               |
| I0105           | Master margin loans                                                                                                           |
| I0106           | Other master loans                                                                                                            |
| I0107           | Other classic risk off-balance sheet items                                                                                    |
| I0108           | Accepted bills of exchange                                                                                                    |

Note: Only instrument group Assets (A), Liabilities (P) and Off-balance sheet items (I) have been presented

### Original maturity codes and description

| Original maturity code | Original maturity code description                                            |
|------------------------|-------------------------------------------------------------------------------|
| 000000                 | Deposits that can be transferred to cash                                      |
| 000001                 | Instrument with original maturity of one month, no grace period               |
| 000002                 | Instrument with original maturity of two months, no grace period              |
| 010250                 | Instrument with original maturity of 250 months, 10 months grace period, etc. |

### Notice period codes and description

| Notice period code | Notice period description                                                                   |
|--------------------|---------------------------------------------------------------------------------------------|
| 000                | Deposits without notice period                                                              |
| 001                | Deposits with notice period greater than one day and less or equal to one month             |
| 002                | Deposits with notice period greater than one month and less or equal to two months          |
| 003                | Deposits with notice period greater than two months and less or equal to three months, etc. |

## Indexation code & currency codes and description

| Indexation code & currency code | Indexation code & currency code description                              |
|---------------------------------|--------------------------------------------------------------------------|
| N000                            | Instrument with no indexation                                            |
| V***                            | Instrument is indexed to foreign currency with a two-way currency clause |
| J***                            | Instrument is indexed to foreign currency with a one-way currency clause |

Note: CNB BIRD example: VEUR, instrument is indexed to Euro with a two-way currency clause.

## Portfolio codes and description

| Portfolio code | Portfolio code description                                                                                    |
|----------------|---------------------------------------------------------------------------------------------------------------|
| KIP            | Loans and advances portfolio                                                                                  |
| DRT            | Financial instruments held for trading portfolio                                                              |
| ZFM            | Fair value (macro hedging) portfolio                                                                          |
| UPO            | Investments in subsidiaries portfolio                                                                         |
| XXX            | Not applicable                                                                                                |
| FVO            | Portfolio of financial instruments that are not actively traded, valued at fair value through profit and loss |
| DIP            | Non-current assets classified as held for sale portfolio                                                      |
| ZNT            | Cash flow hedged items portfolio                                                                              |
| ZUI            | Net investments in foreign subjects hedged portfolio                                                          |
| ZFV            | Fair value hedged items portfolio                                                                             |
| AMT            | Financial instruments measured at amortised cost portfolio                                                    |
| DDD            | Financial instruments held to maturity portfolio                                                              |
| GOP            | Disposal groups classified as held for sale portfolio                                                         |
| UPD            | Investments in associates portfolio                                                                           |
| UZP            | Investments in joint venture portfolio                                                                        |
| RZP            | Financial instruments available for sale                                                                      |
| UUN            | Property investment portfolio                                                                                 |

## Marketability codes and description

| Marketability code | Marketability code description            |
|--------------------|-------------------------------------------|
| N                  | Non-marketable loans                      |
| U                  | Loans occasionally traded                 |
| P                  | Securitised loans                         |
| X                  | Non-applicable                            |
| R                  | Loans traded with no credit risk transfer |

### Capital characteristics codes and description

| Capital characteristics code | Capital characteristics code description                                                                 |
|------------------------------|----------------------------------------------------------------------------------------------------------|
| N                            | Not applicable                                                                                           |
| P                            | Related to subordinated debt instruments that show some characteristics of equity instruments            |
| H                            | Related to liabilities instruments that show some characteristics of hybrid instruments                  |
| A                            | Related to assets instruments that show some characteristics of other equity instruments and shares      |
| D                            | Related to liabilities instruments that show some characteristics of other equity instruments and shares |

### Risk group codes and description

| Risk group code | Risk group code description                                                                        |
|-----------------|----------------------------------------------------------------------------------------------------|
| 00              | Not applicable                                                                                     |
| AA              | Instrument is classified in risk category A, overdue by less than 90 days                          |
| A9              | Instrument is classified in risk category A, overdue by more than 90 days and / or unlikely to pay |
| B1              | Instrument is classified in risk category B - 1                                                    |
| B2              | Instrument is classified in risk category B - 2                                                    |
| B3              | Instrument is classified in risk category B - 3                                                    |
| CC              | Instrument is classified in risk category C                                                        |

### Embedded derivative codes and description

| Embedded derivative code | Embedded derivative code description   |
|--------------------------|----------------------------------------|
| 0                        | Instrument with no embedded derivative |
| 1                        | Instrument with embedded derivative    |

### Related variable codes and description

| Related variable code | Related variable code description                            |
|-----------------------|--------------------------------------------------------------|
| 01                    | Interest rate                                                |
| 02                    | Exchange rate                                                |
| 03                    | Exchange rate and interest rate                              |
| 04                    | Equity security paper price                                  |
| 05                    | Loan                                                         |
| 06                    | Commodity                                                    |
| 07                    | Stock exchange or compound equity and debt instruments index |
| 08                    | Short-term debt securities                                   |
| 09                    | Long-term debt securities                                    |
| 10                    | Equity security papers                                       |
| 99                    | Other                                                        |

## Type of amount codes and description

| Type of amount code | Type of amount code description                                                                                                                                                                            |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                   | Outstanding claims (liabilities)                                                                                                                                                                           |
| 2                   | Overdue claims (liabilities)                                                                                                                                                                               |
| 3                   | Claims (liabilities) arising from accrued interest receivable or dividend payable                                                                                                                          |
| 4                   | Claims (liabilities) arising from past due interest or dividend                                                                                                                                            |
| 5                   | Value adjustments of claims relating to balance sheet items or provisioning for contingent liabilities for off-balance sheet items                                                                         |
| 6                   | Value adjustments of claims arising from interests or dividends                                                                                                                                            |
| 7                   | Discount                                                                                                                                                                                                   |
| 8                   | Premium                                                                                                                                                                                                    |
| 9                   | Contracted value                                                                                                                                                                                           |
| 10                  | Fair value which does not include data on respective outstanding or overdue interest or dividends and accompanying value adjustments                                                                       |
| 11                  | Embedded derivative – contracted value                                                                                                                                                                     |
| 12                  | Embedded derivative – fair value                                                                                                                                                                           |
| 13                  | Disposal of (write-off) principal at the expense of value adjustment                                                                                                                                       |
| 14                  | Disposal of (write-off) interest at the expense of value adjustment                                                                                                                                        |
| 15                  | Adjustments (changes) of valuation                                                                                                                                                                         |
| 16                  | Cumulative increase of value adjustments due to increased credit risk                                                                                                                                      |
| 17                  | Cumulative decrease of value adjustments due to decreased credit risk                                                                                                                                      |
| 18                  | Gross total claims (liabilities) arising from principal                                                                                                                                                    |
| 19                  | Gross total claims (liabilities) arising from interest                                                                                                                                                     |
| 20                  | Gross total amount of exposure (liabilities) protected by collateral at any part                                                                                                                           |
| 21                  | Value adjustments of exposure protected by collateral or protection                                                                                                                                        |
| 22                  | The amount of market value (where applicable) or nominal value of tangible credit protection or contracted value of intangible credit protection                                                           |
| 23                  | The amount of exposure and withdrawal of the limits required to calculate exposure                                                                                                                         |
| 24                  | The amount of unhedged exposure to currency induced credit risk arising from principal (after impairment for value adjustments or provisions)                                                              |
| 25                  | The amount of unhedged exposure to currency induced credit risk arising from interest (after impairment for value adjustments or provisions)                                                               |
| 26                  | The amount of hedged exposure to currency induced credit risk arising from principal (after impairment for value adjustments or provisions)                                                                |
| 27                  | The amount of hedged exposure to currency induced credit risk arising from interest (after impairment for value adjustments or provisions)                                                                 |
| 28                  | The amount arising from principal based on Article 6, paragraph 4 of the Decision on the classification of placements and off-balance sheet liabilities of credit institutions <sup>35</sup>               |
| 29                  | The amount arising from interest based on Article 6, paragraph 4 of the Decision on the classification of placements and off-balance sheet liabilities of credit institutions                              |
| 30                  | Cumulative depreciation (write-off) of the principal and interest based on value adjustment starting from 1 January of the current year to the reporting date                                              |
| 34                  | The gross amount of placements that have been restructured and renewed according to Article 7 of the Decision on the classification of placements and off-balance sheet liabilities of credit institutions |
| 37                  | Repayment schedule or interest payment plan                                                                                                                                                                |
| 38                  | Cumulative increase in provisions due to increased credit risk                                                                                                                                             |
| 39                  | Cumulative decrease in provisions due to credit risk mitigation                                                                                                                                            |
| 40                  | Collection of placements (written off in recent years)                                                                                                                                                     |
| 41                  | Total amount of new businesses                                                                                                                                                                             |

<sup>35</sup> [Decision on the classification of placements and off-balance sheet liabilities of credit institutions.](#)

| Type of amount code | Type of amount code description                                                                                                                                                                                 |
|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 42                  | Average weighted nominal interest rate on new businesses                                                                                                                                                        |
| 43                  | Average weighted effective interest rate on new businesses                                                                                                                                                      |
| 44                  | Average weighted nominal interest rate on the outstanding amount                                                                                                                                                |
| 45                  | Average weighted effective interest rate on the outstanding amount                                                                                                                                              |
| 50                  | Cumulative amount of the income statement starting from 1 January of the current year                                                                                                                           |
| 51                  | Cumulative interest income on an interest-bearing instrument that is not the subject of the Decision on the classification of placements and off-balance sheet liabilities of credit institutions               |
| 52                  | Cumulative income from equity shares in capital                                                                                                                                                                 |
| 53                  | Cumulative interest expense by interest-bearing instrument starting from 1 January of the current year to the reporting date                                                                                    |
| 54                  | Cumulative depreciation of tangible and intangible assets starting from 1 January of the current year to the reporting date                                                                                     |
| 55                  | Cumulative gain or loss from assets sale, value adjustments by instruments of changes in the fair value of assets starting from 1 January of the current year to the reporting date                             |
| 56                  | Cumulative interest income from partially recoverable or non-recoverable placement in accordance with the Decision on the classification of placements and off-balance sheet liabilities of credit institutions |
| 57                  | Cumulative unrealised gain (loss) from the value adjustment of the financial assets starting from 1 January of the current year to the reporting date                                                           |
| 58                  | Cumulative value adjustment of pledge for identified losses on individual or group basis or cumulative cost of discretion starting from 1 January of the current year to the reporting date                     |
| 59                  | Cumulative expense of adjusting receivables by interest income starting from 1 January of the current year to the reporting date                                                                                |
| 63                  | The amount of securities refers to the number of purchased shares and (or) issued shares in the investment fund or issued debt securities                                                                       |
| 64                  | Off-balance sheet claims arising from principal                                                                                                                                                                 |
| 65                  | Off-balance sheet claims arising from interest                                                                                                                                                                  |
| 66                  | The price paid for the sold placement                                                                                                                                                                           |

## Annex 5

### Abbreviations

| Abbreviation | Abbreviation description                               |
|--------------|--------------------------------------------------------|
| ACTUS        | Algorithmic Contract Types Unified Standards           |
| AnaCredit    | Analytical credit datasets                             |
| ASI          | Aggregated statistical reports                         |
| BIRD         | Banks' Integrated Reporting Dictionary                 |
| BOP          | Balance of payments                                    |
| BSI          | Balance sheet items                                    |
| CNB          | Croatian National Bank                                 |
| DWH          | Data warehouse                                         |
| EBA          | European Banking Authority                             |
| ECB          | European Central Bank                                  |
| ERD          | Entity relationship diagram                            |
| ERF          | European Reporting Framework                           |
| ESA 2010     | European System of National and Regional Accounts 2010 |
| ESCB         | European System of Central Banks                       |
| ETL          | Extraction, Transformation, Load                       |
| EU           | European Union                                         |
| EXDI         | ESCB XML data integration                              |
| IAS          | International Accounting Standards                     |
| IFRS         | International Financial Reporting Standards            |
| ISIN         | International Security Identification Number           |
| ISO          | International Organization for Standardization         |
| IT           | Information Technology                                 |
| KPI          | Key Performance Indicators                             |
| MIR          | MFI interest rates                                     |
| MFI          | Monetary Financial Institutions                        |
| NCB          | National Central Bank                                  |
| OeNB         | Oesterreichische National Bank                         |
| PUMA 2       | Procedura Unificata Matrici Aziendali 2                |
| SQL          | Structured Query Language                              |
| SDMX         | Statistical Data and Metadata eXchange                 |
| SEC          | Securities issues statistics                           |

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