Challenges in compiling Polish debt securities statistics[1]

Piotr Boguszewski[2], Jacek Kocerka[3] and Marcin Sienicki[4]

1. Introduction

We should start our considerations by asking the fundamental question in this context: why are debt securities statistics important for central banks, and especially for the National Bank of Poland? The answer is complex and forces us to limit ourselves to a few main aspects of this problem. One reason is obvious – if the statistical system imposes a responsibility on the central bank it must meet all the requirements of statistical excellence. This is a very important argument, but only a formal one for our interest in this subject. There is a second stream of motives for addressing this problem in central banks. Experience gained over the last decade shows clearly that debt securities, especially those issued by enterprises, are becoming increasingly important for monetary transmission mechanisms and for financial stability.[5] Among other things, there is empirical evidence that corporate bond spreads lead real economic activity.[6] The situation in the debt securities market is also meaningful for the general condition of the credit market, as bonds are close substitutes for banking credit. Development of the debt securities market also contributes to the so-called financial market deepening effect, with multiple consequences for transmission mechanisms.[7] It should be noted that, owing to the wide variety of channels through which debt securities can interfere with monetary policy operations, the central banks are interested in collecting detailed information on these instruments. In practice it results in a complexity of standards for debt security statistics that central banks are expected to meet.

Figure 1 relates to the case of Poland. Since the second half of 2005 we have observed very high dynamics in the growth of corporate debt securities, significantly exceeding the dynamics of loans in some subperiods. In consequence, the bonds/loans ratio rose after accession to EU. It is known that there is a positive correlation between the commercial bond market and economic perspectives. For Poland, forecasts are good in this respect. We can foresee further development of this market in Poland and its growing importance for monetary policy in the future. Although the debt securities market in Poland is not large at present[8] compared to other developed economies, there is evidence for its rapid growth – in ways typical of many "catching-up" economies.

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[1] The views presented in this paper are those of authors and do not necessarily represent the official position of institutions with which they are affiliated.

[2] National Bank of Poland, University of Warsaw, piotr.boguszewski@mail.nbp.pl.

[3] National Bank of Poland, jacek.kocerka@mail.nbp.pl.

[4] National Bank of Poland, macin.sienicki@mail.nbp.pl.

[5] EP Davis, "Multiple avenues of intermediation, corporate finance and financial stability", *IMF Working Paper*, no 115, 2001.

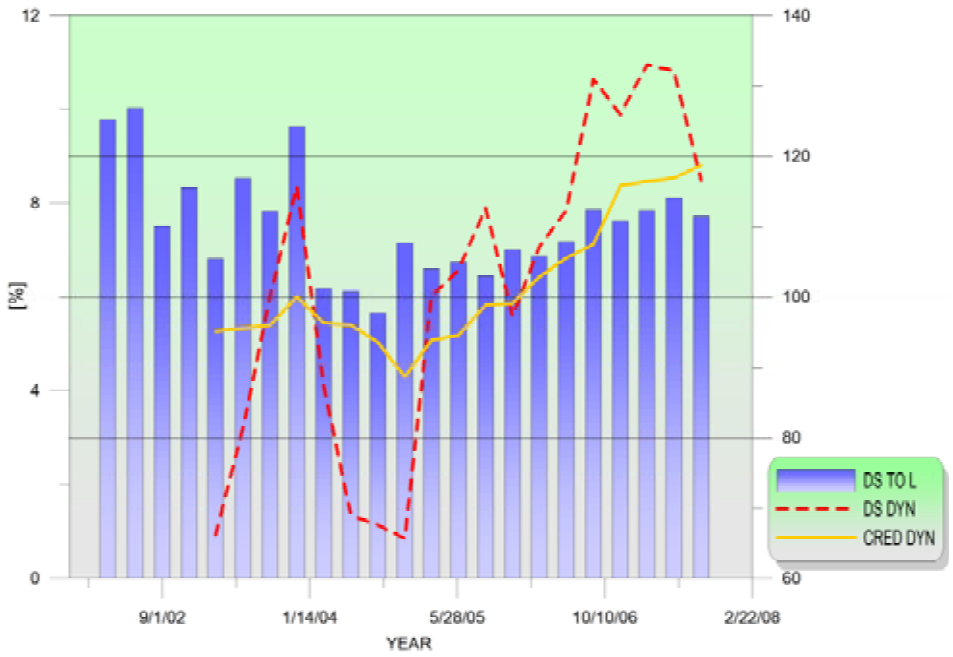
[6] See, for example, G De Bond, "Euro area corporate debt securities market: First empirical evidence", *ECB Working Paper*, no 164, 2002.

[7] I Visco, "Financial deepening and the monetary policy transmission mechanism", speech delivered at the IV Joint High-Level Eurosystem – Bank of Russia Seminar, Moscow, 10–12 October 2007.

[8] Total value of debt securities reached approx. PLN 500 billion.

Figure 1

Debt securities and credit



Yearly dynamics of credit and loans to enterprises (CRED DYN – right axis), bond issues (DS DYN – right) and ratio of bonds to credit and loans (DS TO L – left, in per cent) in Poland.

Source: authors' calculations for companies with more than 49 employees and reporting to the Central Statistical Office of Poland.

For compiling debt securities statistics, the National Bank of Poland primarily uses information from the National Depository of Securities. Domestic banks also provide the NBP with information about debt securities on behalf of their customers. For securities issued abroad, data are collected from end investors.

Overall analysis of the quality of debt securities statistics leads us to conclude that although the data quality is good, some problems are visible. These are difficulties in finding good data sources for the household sector, and information on securities traded outside the regulated market. We are also aware that our reporting agents have problems in the appropriate classification of financial assets. Comparison of information from two data sources (stocks from the National Depository for Securities and flows from balance of payments statistics) also confirm that there is room for improvement. We notice some inconsistency between stocks and flows data, showing that those two datasets give a similar but not identical picture of the economy.

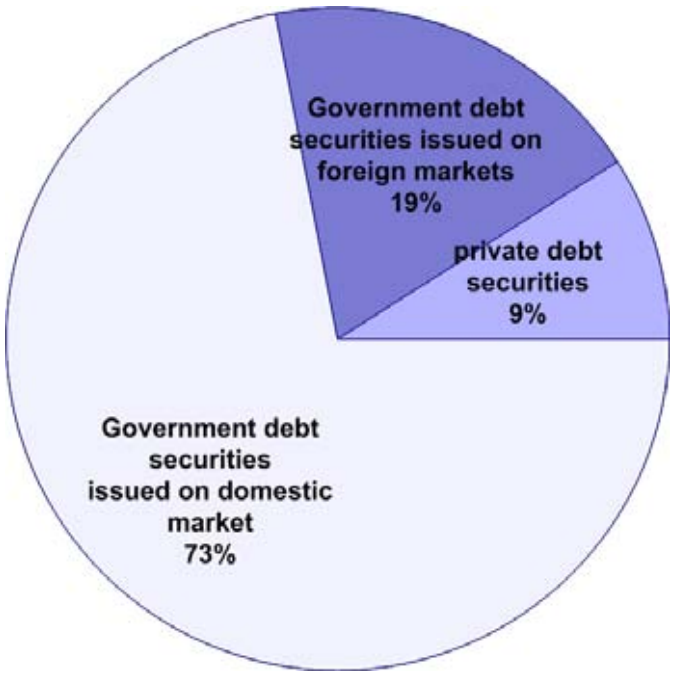
This paper is organised as follows: Section 2 gives a description of the statistical system used for compiling debt securities statistics in the NBP. In section 3 we use a Data Quality Assessment Framework to evaluate our statistics and to identify areas in which quality can be improved. Finally, we draw some conclusions.

2. Description of the statistical system

For the purpose of this paper we treat as Polish debt securities all those securities that interest the National Bank of Poland. These cover all debt securities issued in the domestic

market as well as debt securities issued by Polish residents in foreign markets. The total value of debt securities reached approx. PLN 500 billion (EUR 140 billion, USD 200 billion) in 2007.

Figure 2



Polish debt securities market.

Source: authors' calculations.

As shown in Figure 2, the greatest proportion of the debt securities market in Poland is made up by government securities issued in the domestic market. Information for this part of the market is collected directly from the National Depository for Securities.

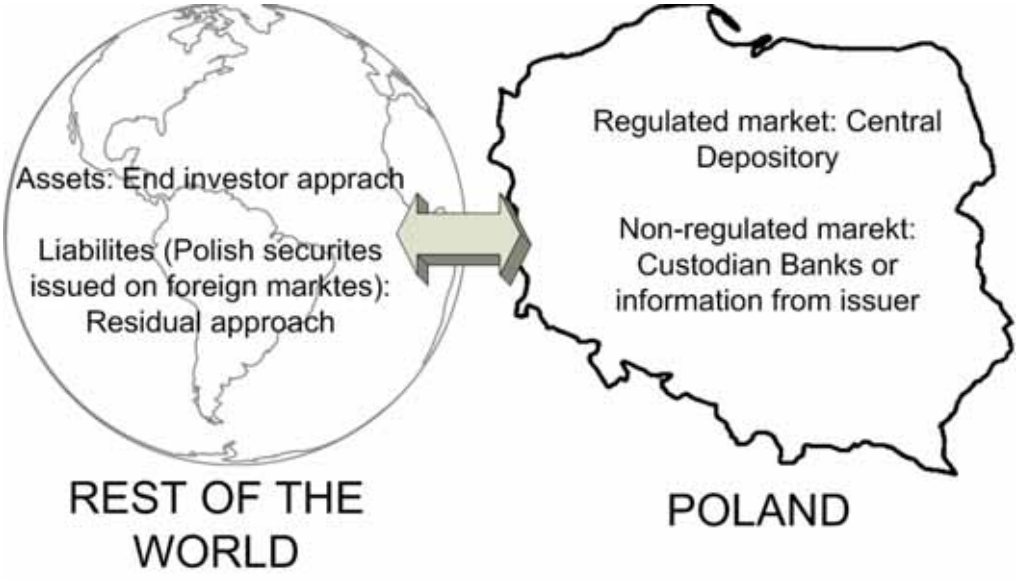
We should remember that the infrastructure for the securities market has been established quite recently, compared with other developed economies, and that all securities traded in the regulated market must be dematerialised and registered with this centralised depository. In Poland there is a single centralised depository institution, which is good for data quality. For government debt securities traded in the domestic regulated market, the National Bank of Poland is able to collect information directly from the National Depository for Securities. The Depository provides the NBP with information on stock and flows of debt securities it stores, broken down by institutional sector of holders for each single security (on a security-by-security basis). The NBP also collects information about non-resident transactions in debt securities for balance of payments statistics purposes. These data come from the settlements system. Polish banks are obliged to report information to the NBP on their own behalf as well as for their customers.

Debt securities issued by government in external markets are also important from the National Bank of Poland's point of view. In this case we apply the residual approach – the NBP collects information from the government on the amount of securities issued abroad, as well as information from Polish residents about their holdings of those securities.

The last area of the market under discussion is securities issued by monetary financial institutions (MFIs) and companies. These securities are usually not traded in the regulated market. They are issued in either domestic or foreign markets. For securities issued in Poland (mainly short-term commercial papers), information from financial intermediaries

(mainly custodian banks) is used to compile the statistics. In the case of foreign markets, information is collected from issuers and resident holders (residual approach).

Figure 3



Data sources for debt securities statistics.

3. Evaluation of the system

The aim of the Statistics Department of the central bank is to provide good-quality statistical data. Data quality can be defined in various ways. We have adopted a Data Quality Assessment Framework (DQAF) to evaluate our data collection system. Against this background we try to describe the merits and drawbacks of the statistical system currently used by the National Bank of Poland to compile data on debt securities statistics. The IMF DQAF identifies quality-related features of the governance of statistical systems, statistical processes, and statistical products.

3.1 Data quality

Data quality is a multidimensional concept. The IMF defines five quality dimensions from the input (process/institutional framework) and the output (product) side, which can be used for assessing the quality of the collection and compilation system. The dimensions of the quality are:

3.1.1 Assurances of integrity

This dimension relates to the adherence to the principle of objectivity in the collection, compilation and dissemination of statistics. It encompasses institutional arrangements that ensure professionalism in statistical policies and practices, transparency and ethical standards. The three elements for this dimension of quality are professionalism (statistical policy and practice are guided by professional principles); transparency (statistical policy and practice are transparent); and ethical standards (statistical policy and practice are guided by ethical standards).

This dimension is common to all statistical activities in the central bank and has no specific reference to debt securities statistics; we will not therefore analyse this dimension in the present paper. It was assessed by the International Monetary Fund in its *Report of Observance Standards and Codes* as

> Staff at all three data compiling agencies demonstrate a high degree of professionalism, and compile data on an impartial basis, selecting techniques purely on statistical considerations. Transparency of statistical practices is promoted by the publication and wide dissemination of the laws and regulations under which the work is undertaken. Ethical standards are maintained by codes of conduct that have recently been updated and that the staff are committed to observe.[9]

3.1.2 Methodological soundness

This dimension covers the idea that the methodological basis for the statistics should be sound and that this can be attained by following internationally accepted standards, guidelines or good practices. This dimension is dataset-specific, reflecting different methodologies for different datasets. Debt securities statistics are part of different datasets compiled or used in the central bank and there is no unified methodology for compiling these data. Debt securities are included in balance of payments, money and banking, financial accounts, securities issues statistics and others. Four elements draw our attention here:

- Concepts and definitions – these are used in accord with internationally accepted standards. For debt securities statistics, these standards are the IMF *Balance of Payments Manual*, *System of National Accounts*, and the *European System of Accounts*. It is also important to emphasise that consistency between different manuals is expected. The current updating process of the different manuals (SNA, BOP, ESA) will improve consistency between manuals.
- Scope – this is in accord with internationally accepted standards, guidelines and/or good practices.
- Classification/sectorisation – data are good quality if classification is in accord with internationally accepted standards. Below, we use some examples to illustrate particular classification issues.
- Basis for recording – this means, in the context of debt securities, that the market value should be used as a basis for recording.

3.1.3 Accuracy and reliability

This dimension covers the idea that statistical outputs sufficiently portray the reality of the economy. It is also data-specific, reflecting the sources used and their processing. The five elements of this dimension cover the following:

- Source data – the data sources used in the compilation process provide an adequate basis for producing statistics. Taking into account the structure of the Polish debt securities market, data sources are reliable and exhaustive; however, in the next section we show that problems with the reporting population have not been fully solved.

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[9] IMF, Poland, *Report on the observance of standards and code – Data module; response by the authorities; and detailed assessments using the data quality assessment framework*, available at http://www.imf.org/external/pubs/ft/scr/2003/cr03311.pdf.

- Assessment of source data – whether the data sources are regularly assessed.
- Statistical techniques – techniques applied are sound and confirm statistical procedures. It is important to stress that procedures used to compile debt securities statistics are not straightforward, especially if a security-by-security collection system is used. In this case the compilation process is rather complicated, as the compiler has to merge information from the respondent with information from commercial sources or other databases (CSDB, for example). Moreover, if a residual approach is used as part of the compilation process, the system becomes more and more complicated.
- Assessment and validation of intermediate data and statistical outputs; and
- Revision studies.

3.1.4 Serviceability

This dimension relates to the need that statistics are disseminated with an appropriate periodicity in a timely fashion, are consistent internally and with other major datasets, and undergo a regular revision policy. The three elements for this dimension are as follows:

- Periodicity and timeliness
- Consistency – for debt securities statistics, there should be consistency between stock and flows. For Poland, flow data on non-resident buying/selling debt securities come from banks' settlements, while stocks come from the Central Depository. We are able to compare those two datasets, and present this comparison the last part of this paper.
- Revision policy and practice.

3.1.5 Accessibility

This dimension relates to the need for data and metadata to be presented in a clear and understandable manner on an easily available and impartial basis, that for metadata are to be up-to-date and pertinent, and that for a prompt and knowledgeable support service is to be available. This dimension has three elements: data accessibility, metadata accessibility, and assistance to users.

3.2 Classification issues

Good classification is one of the elements of data quality. For a number of dimensions (currency, country etc), our reporting agents usually have no problems with classification.

3.2.1 Debt securities vs credits

An important role in Polish portfolio liabilities is played by bonds issued intra capital groups. These securities are usually held by one or a very limited number of entities – non-resident parent companies or subsidiaries. However, from the legal point of view these instruments are securities and theoretically they are negotiable; in most cases known to the NBP these securities do not change holders from the issue to maturity date. Thus, from the economic point of view, these instruments behave more like credits than debt securities.

3.2.2 Debt securities vs financial derivatives

Debt securities with embedded financial derivatives are another borderline case. Problems emerge at the moment of valuation of such instruments if they are not listed anywhere. A good example here is convertible bonds of large Polish public companies, with low nominal

value, which were in fact intended to be manager options. These instruments, issued as private placements, are bonds only from the legal point of view. Their price is generally similar to the value of conversion option. The lack of a market, and consequently the lack of any market prices, makes valuation very difficult.

Last year new structured products for general public issued by non-resident banks were announced in the Polish market. These products are bonds with embedded options, eg for commodities or stock exchange indices. Although the proportion of debt instrument price in the total value of the instrument is higher than in the convertible bonds described earlier, no market prices are available. One way to value such products can be calculation based on market benchmarks and the prices of underlying instruments.

3.2.3 Remaining vs original maturity

The final problem is classification of debt instruments as long or short term. For securities without an ISIN code, only a holder or custodian of these securities can classify them. The maturity date is very clear for all debt market participants; the issue date, by contrast, is a statistical rather than a market parameter. A market participant understands eg the announcement date or initial date of accrual calculation, but not the “issue date”. This is the first factor that poses a problem for a reporting entity when classifying a security as long- or short-term. The other problem is that, from a market point of view, the remaining maturity is more important for a holder than the original maturity of a security, while the original maturity is essential for statistical purposes.

3.3 Source data

Evaluation of source data is one of the elements included in a description of data quality. The NBP uses various data sources (Central Depository, financial intermediaries, reporting agents etc) to collect information. They are reliable and exhaustive, but in some specific areas, which are fortunately not presently of great importance, some problems remain to be solved.

3.3.1 Households

One of the problems with having good data sources for compiling debt securities statistics lies in a good coverage of households.

In the case of Poland, one specific feature is a relatively high proportion of households as end investors in total portfolio investment assets. Although, local Polish investment funds investing in non-resident securities are becoming increasingly popular among households, on the one hand, while on the other, “wealthy” individual investors stay with their non-resident banks, which provide them with a full range of private banking services. Private banking is still at a rather early phase of development in the Polish market, as is brokerage of securities issued by non-residents. These factors account for the investment habits of Polish households. Average households prefer holdings of units and certificates issued by domestic investment funds investing in non-resident securities, while “wealthy” households hold their portfolio assets with non-resident custodians. As mentioned above, local financial intermediaries (custodians and brokers) cannot be a reliable source of data on Polish household holdings for the international investment position. The end-investor approach has therefore been chosen for collecting data on portfolio investment assets. Each Polish resident whose holdings of non-resident securities exceed a threshold of EUR 10,000 has a legal obligation to report these holdings to the NBP.

Analysis of the actual reporting population shows a high concentration of the total holdings in the hands of a relatively small number of respondents. It is thus very important to cover all “wealthy” respondents, because if a single one is missing, their reports may change the total

figures dramatically. The other information we have (as those respondents are stakeholders of Polish public companies) suggests that the coverage of these "wealthy" households may not be sufficient. The problem to be solved is a choice between a direct approach, ie better detection of potential "wealthy" respondents, and direct collection of real data or estimation of their holdings based on existing population reports.

3.3.2 Private placements

Another problem is related to ensuring good data sources for securities traded outside the regulated market.

An important part of Polish portfolio liabilities, especially in the corporate, but also in the banking sector, are debt securities without an ISIN code. They are usually issued intra capital groups, eg between a Polish subsidiary and a non-resident parent company, or between a Polish parent company and a related Special Purpose Entity (SPE) abroad. As these securities do not have an ISIN code, they cannot appear in the ECB's CSDB or any security code-oriented commercial database. Notwithstanding the classification issues (direct or portfolio investment, security or credit) described earlier, the main problem is how to trace such securities. Every resident issuer that issues securities in the foreign or domestic markets, but without intermediation of any Polish institution, is obliged to report the characteristics of such securities to the NBP. Again – as in the case of "wealthy" households – the actual reporting population may be too limited for the possible population. In the case of bonds issued by a Polish parent company to an SPE, tracing is more possible – they are usually a means of transferring capital raised by the issue of SPEs' debt securities in the international market. Securities issued by non-resident SPE (in the case of Poland, usually established in the Netherlands) in most cases have an ISIN code and can thus appear in securities databases. In other cases, close cooperation with the largest domestic companies may be the solution.

Domestic SPEs, established for the securitisation of certain assets of banks and other financial intermediaries (eg credit portfolios), are quite a new phenomenon in Poland. Debt securities issued by these SPEs do not have ISIN codes, which may result in the same problems described above. The first known cases show that, because of the amounts issued, securities of this kind may be an important part of Polish portfolio liabilities.

3.3.3 Liberalisation of capital flows and globalisation

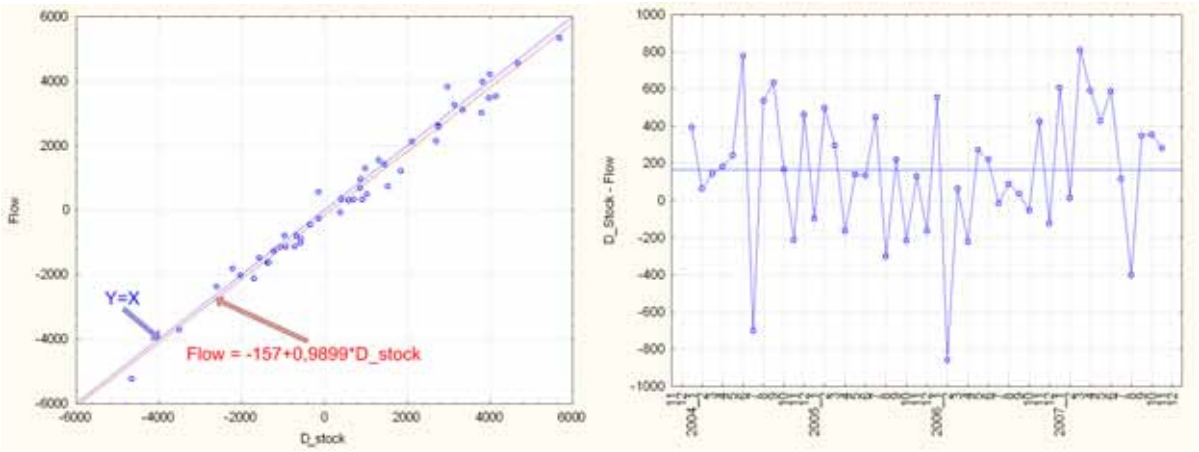
At present, although it is legally possible, debt securities issued by Polish residents are not double-listed, ie traded simultaneously in domestic and international markets. Each issue, if registered, is registered with a single central depositary, domestic or foreign. This provides for easy separation of data collection system into subsystems for securities issued in domestic and international markets, with different approaches, optimal for each market segment. But it is possible, in the immediate future, that Polish debt securities as well will circulate between domestic and one or more foreign markets. This leads the NBP to consider applying a residual approach, currently being used only for securities issued in foreign markets. This approach has the disadvantage, compared with the custodian approach, of complete lack of geographical and sector identification of non-resident holders, even if in the custodian approach it is not always the real end-investor identification.

The same refers to portfolio assets – debt securities issued by non-residents in the Polish market. At present, none of them is double-listed, but, as experience with double-listed shares issued by non-residents shows, there will be a need for necessary adjustments in the data collection system in the immediate future.

3.4 Stock/flow consistency

We have analysed consistency between stock and flows of non-resident holdings of Polish government debt securities. Information on stock of non-resident holdings of debt securities come from the National Depository for Securities, while information on flows is collected by the National Bank of Poland from banks via the settlements system.

Figure 4



Flows and change in stocks (left panel), and their difference over time (right panel).

Source: authors' calculations.

Figure 4 presents a scatterplot of flows and change in stocks. The vertical axis gives the non-resident inflow/outflow of capital into/out of Poland collected by balance of payments statistics. The horizontal axis gives the change in stocks. As this figure shows, these two datasets are generally consistent. If one of them shows a large outflow, the other also shows outflow with a similar value. Theoretically, if these two datasets are consistent, as would be ideal, this scatterplot should be a single line.

However, analysing the right panel of Figure 4, which shows the difference between change in stocks and flows, we observe that the average difference is not equal to zero as it should be. This inconsistency is stable over time and is not dependent on the size of flows or stocks. The average difference between change in stocks and flows is equal to PLN 165 million, which means that flows are systematically lower than the change in stocks by approx. 20%. This difference might have been be caused by the different valuation approach used in these datasets. Stock data are recorded in nominal values, while for flows the market value is used. The other reason for this inconsistency is that banks make mistakes in compiling flows data for balance of payments statistics. Different data sources can also have different classifications of customers as residents or non-residents.

4. Conclusions

Our paper shows the strengths and drawbacks of the statistical system used to compile debt securities statistics in Poland. To reduce weaknesses, various changes in the compilation process are expected in the near future. The NBP will continue its project to change the compilation system.

The settlements system will not be used. The only source for non-resident stocks and flows of government securities will be the National Depository of Securities, and in the new system

those securities will be valued at market value. This is how we intend to reduce inconsistencies in one dataset.

Moreover, new compilation systems allow the NBP to concentrate on the population, which is the most important factor for these statistics. The new system will also enable us to use more sophisticated statistical methods to estimate non-respondents' data.