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The foreign currency mortgage loans in the Polish banking sector and its possible macroeconomic and political consequences

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THE FOREIGN CURRENCY MORTGAGE LOANS IN THE POLISH BANKING SECTOR AND ITS POSSIBLE MACROECONOMIC AND POLITICAL CONSEQUENCES

Abstract

According to the Polish Banking Supervision (KNF) statistics , banking mortgage loans total 22.4% of the overall assets of the Polish banking credit portfolio as of January 2015 data. Around 15% of those loans might have Loan To Property Value proportion (LTV) exceeding 100%. Rapid growth of mortgage loans in Poland was the result of growth of foreign currency mortgage loans. That was the typical situation for Central and Eastern European Countries. In the Polish banking sector, collective provisions typical for retail segment including IBNR (Identified but nor Reported Loss Provisions) provision applied under current IAS 39 seems to be too low to cover credit risk. Assuming conservative credit risk parameters in determining collective provisions might affect adversely the financial situation of the Polish banks. The financial results of the Polish banks might go down considerably. In addition, borrowers having loans denominated in foreign currency have won certain legal cases in Europe and in Poland. Therefore, the presence of the foreign currency denominated mortgage loans (FCML) in the Polish banking sector represents an element of the systemic risk and has to be solved. Growth of FCML weakens the abilities of central banks to control over credit creation and to steer monetary policy. On the other hand, compulsory conversion of the mortgage loans hitherto denominated in foreign currency into mortgage loans in Polish zloty by special law, might create considerable losses in the Polish banking sector and reduction of Capital Adequacy Ratio of the Polish banks. Therefore, direct replication of the Hungarian style legal solution of the foreign currency banking (compulsory loan currency conversion into PLN) loans might create problems in the Polish banking sector. Moreover, potential state aid devoted to some borrowers in Poland that have saved significant amount of money having cheaper foreign currency mortgage loans is controversial from the social justice point of view. Law should not treat favourable one

group of borrowers at the expense of the another one. Any legal solutions to sort out the problem of foreign currency loans have to take these facts into consideration. Given that background, the paper present several ways to resolve the problem of the foreign currency loans in the Polish banking sector.

Complex solution how to tackle FCML problem in the Polish banking sector is needed. Any realistic solution is going to be is linked with extra provisioning after thorough investigation of real nature of FCML borrowers in Poland (households) and their financial standing. Polish Banking Supervision (KNF) should play a leading role in initiating such survey leading to more credible credit risk parameters in IAS 39.

Keywords: financial stability, banking supervision, financial crisis, exchange rate risk.

JEL Classification: G 28, G 01, F 34, E 44.

1. Introduction

Polish accession to the EU as in the other countries that entered EU together with Poland or some years later resulted in certain important economic consequences inter alia:

- GDP growth,
- growth of the nominal wages,
- reduction of unemployment and improvement in labour market,
- access to foreign labour market.

Situation in Poland after EU and earlier NATO accession was to certain extent similar to the situation in Spain and Ireland in the same post EU accession phase in 80s XX century. Poland was regarded as economically and political stable country with positive outlooks for the future. Such positive image of Poland has attracted to Poland foreigners buying property. Polish EU accession was linked with getting rid of barriers for foreigners property purchase. Factors listed above together with several others factors, namely:

- favourable interest rate level,
- low level of indebtedness of the Polish households prior EU accession,
- relatively low standard of Polish households' housing conditions as compared to West European counterparts,
- and easing of the lending standards in Polish banks.

resulted in credit growth in Poland. New sense of stability and positive outlooks (repetition by Poland of Spain and Ireland's economic success of 1990s after those countries entered EU) have encouraged borrowers in Poland to incur mortgage loans.

Mortgage loan growth in Poland after EU accession brought about boom in the residential real estate market which is a phenomena many times recorded in economic history of many countries all over the world. Such boom always leads to real estate assets bubbles.

According to recent studies ([Boissay F., O. Calvo-Gonzalez and T. Koźluk, 2005]; [Duenwald, C., N. Gueorguieva and A. Schaechter, 2005]; [IMF, 2004]), rapid credit growth is a feature of converging economies, especially if it coincides with the low level of indebtedness in the economy. However, if the credit growth is excessive, it may pose risks to the financial and macroeconomic stability of a country. It may lead residential real estate bubbles , whereby assets are priced above their fundamental values as a result of expectations of further price appreciation. In many Central and Eastern Europe countries (CEE countries) prices of assets, particularly residential property, have been rising at high paces, i.e. in Poland house price inflation exceeded in some regions of the country (including Warsaw) 60% on a year-on-year basis in 2006.

As in the other Central and Eastern European countries mortgage loan growth after EU accession and as the result residential real estate asset bubble in Poland were tightly linked with presence of foreign currency mortgage loans. As some experts point (Yesin, 2013), foreign currency mortgage loans create a substantial systemic risk to the European banking sector posing danger into Polish banking stability and this valid issue has to be addressed by Polish and EC regulators as well as Polish government. Prior application of systemic risk mitigation measures, the issue of systemic risk in banking sector needs precise measurement. In my opinion, the measurements already proposed in the literature of systemic risk arising from foreign currency mortgage loans in banking sector should be supplemented in order to determine a full scale of the problem and impact of real estate crisis on systemic risk issue. After proper measurement of the level of the systemic risk in the banking sector, proper solutions can be invented and implemented.

The goal of the paper is to present policy recommendation concerning potential problems arising from the presence of FCML in Polish banking sector. This problem became acute on January 2015 when Polish zloty weakened against Swiss France after Swiss Central Bank abandoned the defending of exchange rate of Swiss Franc against Euro (EUR/CHF at 1.20).

Policy recommendations for Polish banking sector with respect to FCML will be made after discussions of the historical growth of FCML in Poland and presenting of systemic risk arising from FCML. Given the said paper goal, the paper is organized in a following way. In Section 2, I define the origin of mortgage loan growth including foreign currency mortgage loans (FCML) in Poland after EU accession and origin of residential asset bubble in Poland. In Section 3, I define systemic risk in banking sector and special category of systemic risk arising from foreign currency mortgage loans and describe the methods proposed in the literature how to measure that risk with critical analysis. In Section 4, new methods how to measure systemic risk arising from a presence of the foreign currency mortgage loans. These methods derive from IAS 39 provisioning method already applied by majority of the Polish banks. I discuss the drawback of current IAS 39 concept. In Section 5 I present the results from application of IAS 39 method in measuring systemic risk arising from the presence of the foreign currency mortgage loans in the Polish banking sector. In Section 6, I present several implications of the presence of foreign currency mortgage loans (FCML) in the Polish sector and comment possible solutions of the potential problems stemming from such presence already applied in some countries namely Hungary. Finally in Section 7, I put forward some policy recommendations concerning potential problems arising from the presence of the foreign currency loans in Polish banking sector.

2. Origin of growth of mortgage loans in Poland after EU accession. Presence of foreign currency mortgage loans. Residential real estate assets bubble in Poland

Łaszek (2013) indicates that development of the mortgage loans is part of broad system of residential property financing and such development is linked with the following factors :

- macroeconomic stability and low nominal and real interest rate,
- positive deposit interest rate,
- competition between banks,
- efficient mortgage registration system,
- efficient mortgage loan enforcement system.

Almost all those factors were in place in Poland 2004 excluding efficient mortgage registration system and efficient mortgage loan enforcement system. Direct post accession period was in Poland linked with growth of personal income and decrease of unemployment.

According to Zajączkowski and Zochowski (2007) anchoring inflation expectations, achieving balanced economic growth and the accession to the EU, all pushed interest rates in Poland to the historically low levels. Łaszek (2013) points also to demographic factor fuelling housing demands. The number of households was risen and there was growing migration to big cities in Poland in quest for job opportunities. As a result of this and considerable improvement of the households condition an acceleration in credit growth has been observed in Polish households.

Polish EU accession was also linked with getting rid of barriers for foreigners from European Economic Zone property purchase. Therefore, they became active players in the Polish real estate markets buying property mainly for speculation reasons.

Before Poland EU accession (2004), not all requirements listed above were fulfilled. Łaszek (2013) points to additional three factors that were behind growth of mortgage loans in Poland after 2004: privatization of Polish banks , presence of foreign capital in the Polish banking sector and limited role of state subsidies in financing housing needs of population in Poland. Privatization of the Polish banks positively influenced competition between banks. Competition between banks led to domination of sale culture. Banks competitive strategy on that time relied on deep penetration of retail loan segments. As for retail banking, mortgage loans as a banking product seemed to be most profitable and sale of mortgage loans were always associated by parallel sale some other banking products like couple of insurance products, credit cards, various types of banking accounts, investment funds by the banks (*cross selling strategy*). Persons incurring mortgage loan always might have bought at least 4 insurance products: life insurance, unemployment insurance, property insurance, low equity contribution insurance, temporary lack of mortgage collateral insurance. Selling such product would have been extremely hard for the bank without offering mortgage loan first. Foreign currency spreads represented also an important source of banking income from that time.

Załęczna (2010) suggests gap existence between number of households in Poland and number of flats available on the market. The housing per 1000 inhabitants ratio in EU totals 1000 and in Poland only 350 as for data for 2006. Załęczna (2010) suggest also that the stock of housing available in Poland is relatively old.

Mortgage loans since 2004 became more and more available due to liberalization of credit policy by the banks towards retail segment. Such easement of credit standards in the

banking sector was possible because of relatively liberal banking regulations pending in Poland at that time. Banking regulations in Poland till 2009 and even 2013 imposed no restrictions upon borrowing over 100% of the value of the property. (LTV over 100%). There was a tolerance in banking regulations in Poland of mortgage loans LTV ratio over 100% so no borrower's own equity was required by banks. There used not to be extra capital charge over loan denominated in foreign currency in calculation banking capital adequacy ratio. In Polish banking regulations, there was no direct ban on incurring foreign currency loan by individual borrowers in an individual situation where foreign currency did not constitute the prevalent currency of borrower's income. Banking regulations in Poland till 2006 neither required from Polish banks performing extra borrower's creditworthiness simulation reflecting interest rate and foreign currency risk nor borrower's (household) statement on proper perception of that financial risk categories in the loan agreement. Usage of Credit Bureaus reports by banks operating in Poland was not mandatory and persons having a lot debts and problems with servicing them theoretically were not cut off from new loans. Responsible lending was not dominant lending style in Poland. There was also no obligation for a bank to present on paper to a borrower an impact on foreign interest rate and foreign currency fluctuations and warning on consequences of real estate assets bubble. Maturity of mortgage loans in Poland till 2011 was not time-limited so even 45 years loan maturity was available on the market.

To defend the last decade of Polish banking regulations, one important issue remained the same during post accession period. Borrower's creditworthiness analysis based on borrower's tax return, borrowers credit history and in some cases borrowers professional status had to be conducted and rising value of a borrower's property as a collateral was supposed not to be the only one lending criteria although a lot of borrowers were very disappointed. Self-employed borrowers having run their business activity for a short period of time have found more difficult to obtain mortgage loan as compared to borrowers having fixed employment professional status.

Polish personal bankruptcy law and enforcement code did not limit borrowers financial responsibility to the current market value of the collateral. Therefore, handing over house key by borrowers (households) to the banks was not a source of mortgage loan repayment when borrower's financial difficulties have emerged.

As for asset and liabilities banking management, in Poland there were not strict regulations concerning maturity and currency matching. Neither market of long – term mortgage bonds in Poland nor market for other banking long term securities has been developed and remained in premature stage. Therefore, there was growing foreign currency and maturity mismatch in asset and liabilities of the Polish banks. It should be also noted that securitization of assets was almost non-existent in Poland so banks kept their mortgage exposure including FCML in their books.

Brzoza-Brzezina (2010) points to monetary tightening as the main factor behind the growth of FCML. Monetary tightening led to reduction of growth of local currency mortgage loans and speeds up of FCML. Therefore, the central bank policy resulted in changing the FCML. In Poland, FCML loans servicing were cheaper than servicing PLN mortgage loans. Monetary policy was the not only one factor affecting the growth of FCML. M. Kabza (2014) points to four main factors behind the growth of FCML: growing penetration of foreign banks, moderate concentration in the banking sector evoking competition, difference between interest rate and easy access by local banks to the wholesale banking funding (loans from foreign owners and swap transactions). Privatization and restructuring process of the banking sectors also affected growth of FCML in Eastern and Central Europe. Due to the said factors, banks in Eastern and Central Europe became a part of international banking group. The foreign indebtedness of banks started to increase. Foreign shareholders of Polish banks supplied them with foreign currency liquidity (interbank medium-term loans). Foreign currency deposit base played a minor role as foreign mortgage loan currency funding as compared to foreign currency loans for banks from its parent companies and interbank market. Interbank market was important with respect to banks in Poland having no foreign shareholders (financing via interbank deposit or CIRS) and no relative access to funding in Euro or CHF. Kabza (2014) suggests that pricing of interbank medium-term loans – source of FCML funding did not properly reflect risks: foreign exchange risk, country risk and funding risk. Risk premium of the interbank term loans were too low.

Popularity of foreign currency mortgage loans in Poland was a part of growing popularity of foreign currency loans in the other Central and Eastern Europe countries. Poland was not exceptional. Yesin (2013) points to the fact that the foreign currency mortgage loans represent a dominant share of total loans to the non-banking sector in Europe as of 2011. That share varies from 90% in Latvia to 40% in Poland and 10% in Czech Republic.

In an economic literature given the results of various econometric models there are controversies about determinants of foreign currency loans. Intuitively variables like interest rate differentials was not confirmed by some econometric models. Curasesma, Fidrmuc and Hake (2013) indicate that supply factors (foreign currency deposits and the minimum variance portfolio ratio) appear to play a more significant role in determining foreign currency loans than demand factors (interest rate differentials). Minimum variance portfolio is defined as ratio of inflation volatility to real exchange rate volatility. Brown (2010) points that surprisingly, the widespread view that foreign currency lending in Central and Eastern Europe is driven by funding of banks in foreign currencies has not yet been substantiated by empirical analysis. Comparisons of aggregate cross-country data document higher shares foreign currencies lending in countries where banks have larger cross-border liabilities (Bakker and Gulde, 2010; Basso et al., 2007). However, whether cross-border liabilities are causing or being caused by foreign currency loans is hard to establish from such aggregate data.

Jeanne (2005) points to two interesting facts. First, borrowers might accept exchange rate risk, especially in countries with an unstable monetary environment. Second fact is linked with greater inflation volatility. Greater inflation volatility might be regarded as proxy for the lack of monetary credibility. That kind of volatility might induce more borrowing in foreign currency because foreign currency borrowing can be associated with more stable real interest rate than borrowing in local currency. Hence, from the perspective of the borrower, the impact of this factor on foreign currency borrowing can be associated with more stable real interest rates than borrowing in local currency.

Curasesma, Fidrmuc and Hake (2013) suggest also one more possible factor behind a growth of foreign currency mortgage loans – EU euro adoption perspective. Such perspective should in theory stabilize monetary policy and positively influence upon the strength of local currency. However, such determinant have been included in only few model specifications. Hence, this issue require further investigation.

Having access to long term financing mainly in foreign currency , borrowers (households) in Poland either bought properties to meet their housing needs or for speculation purposes because prices of residential real estate rose considerably since 2004 and future sale of properties guaranteed good return on investment. Łaszek (2013) points to herding behavior of potential property buyers believing in constant growth of the residential property prices.

Due to the factors listed above the housing demand growth was recorded in Poland between 2004-2006. The supply of new real estate was fixe by nature and by a lot of investment barriers still existing in Poland. Zajączkowski and Żochowski indicate (2007) that initially, rapid growth of loans to households that had taken place in the period of 1998-2006 did not necessarily imply considerable increase in average debt burden service ratio of all borrowers. Average debt burden ratio increased only among those households that repay mortgage loans. In the case of all borrowers the median and mean of debt service burden ratio had actually decreased in this period. This may be because the number of borrowers increased and the average income per household member grew in this period. However the most important reason was the decrease in debt servicing costs, which was caused mainly by:

- strong interest rates fall the average interest rate on household loans decreased from the level of 26.9% in 1998 to 9.5% in 2006),
- considerable rise in average loan maturity; this is the result of both increasing value of mortgage loans in relation to other usually short-term loans and increase in average maturity of mortgage loans,
- increase the share of foreign currency mortgage loans (hereinafter called FCML) in total loans to households' in Poland which on average have lower debt servicing costs (lower interest rates, higher average loan maturity). The continuing appreciation of the zloty in 2004-2008 has additionally decreased the debt servicing costs of these loans for household, whereby it has made both capital and interest payments smaller.

The vast majority of foreign currency mortgage loans in Poland had variable interest rates. Two main forms of repayment were widely accepted i.se decreasing installments and annuities. Balloon payments were not widely accepted by the banks in Poland with respect to mortgage loans.

It is noteworthy that very few retail borrower (households) in Poland did receive income in foreign currency or have income indexed in foreign currency. In that context one can name lawyers, employees of renowned global consulting firm and self-employed persons running their own businesses that generate export revenues in foreign currencies. The issue of Polish emigration transferring money to Poland to repay mortgage loans denominated in foreign currency require further investigation but a majority of Poles that have emigrated since 2004

are not going to return to Poland in foreseeable future and invest in residential real estate somewhere else than in Poland.

It is also noteworthy that foreign currency mortgage loans in Poland for households were almost no hedged. Borrowers (households) did not buy forwards, futures or were not involved in CIRS transactions. Credit default swaps in Poland are almost not popular, especially among retail borrowers (households).

Siemińska (2013) shows that unprecedented boom in mortgage loan growth took place in Poland since 2004. The volume of mortgage indebtedness in Poland rose from 35.8 bn PLN to 192.6 bn PLN in 2008. Share of mortgage loans to GDP remained not so high (19%) as of 2011. The situation changed significantly in 2008 . Subprime crisis spread all over Western world including Poland. The prices of residential real estate went down in Poland and the credit supply in Poland was reduced due to new stringent banking regulations as well as rising unemployment Interbanking market has been frozen. Funding especially funding of FCML became scarce resource so funding interest rate rose significantly as foreign owners of banks operating in Poland reduced funding of FCML lending in their banking Polish subsidiaries.

Łaszek (2013) points to the fact of growing maturity mismatch between assets and liabilities in the Polish banking sector. As of 2012 data current liabilities finance long-term banking commitments. Liabilities with maturity over 5 years amounted to Orly 5.3% of Total banking assets whereas commitment over 5 years constituted over 34.5% of the total assets of the Polish banking sector. Such maturity mismatch represents an element of risk in the Polish banking sector.

Since 2006, Banking Supervisor Authority in Poland have pushed banks to disclose the exchange rate risks of FCML to clients and to tighten the eligibility criteria for such loans (precise instructions how to check creditworthiness of the clients, how to value a property, own equity requirement, usage of Credit Bureau reports). The new banking regulations in Poland pertaining mortgage loans (various generations of Recommendation S, Recommendation T, J, consumer credit law) were aimed at curbing FCML and limit them to banking's best clients only in top income brackets. Extra 100% risk weigh in credit risk standard method has been introduced for foreign FCML. Moreover, clients in Poland were granted a possibility to repay FCML directly if foreign currency bought outside lending bank. It is earmarked for limiting banking spread revenues.

Such toughening regulations related to FCML was the wider trend in Central and Eastern Europe. In June 2010 the European Central Bank (ECB) stated that national efforts to rein in foreign currency lending have had little impact and called for coordinated efforts, including among regulators from the home countries of banks which own subsidiaries in eastern Europe (ECB, 2010). In this line of thinking foreign currencies, lending is largely supply-driven, with foreign currency funding of banks, often by their parent banks, at the heart of the problem. To the extent that foreign currencies lending does not reflect macroeconomic uncertainty and related underlying vulnerabilities, regulation may help to counterbalance distortions – such as banks and borrowers that disregard the negative externalities of foreign currencies loans in terms of increasing the risk of a systemic crisis (see Ranciere et al., 2010).
Referring to Brown (2010) and Curasesma, Fidrmuc and Hake (2013) findings, FCML was a result of dominant selling culture prevailing in Polish banks after 2004 and growing penetration of retail segments with mortgage loans playing a vital role in that penetration.

3. Systemic risk in banking sector. Systemic risk arising from foreign currency mortgage loans for households (FCML case)

Systemic risk in the financial system is a multifaceted phenomenon. De Bandt and Hartmann (2000) and Georg (2011a,b) provide an in-depth discussion of systemic risk. First, it can arise in the form of contagion among financial institutions: The failure of one institution can trigger cascading defaults of the others through their linkages in the interbank market.
Second, systemic risk can arise in the form of joint failures of financial institutions as a result of their exposure to a "common market shock," as was the case during the recent financial crisis. Foreign currency mortgage loans to the unhedged non-banking sector are remarkably prevalent in Europe and create a significant exchange-rate-induced credit risk to European banking sectors. In particular, Euro , dollar or Swiss franc (CHF) denominated loans, popular in Central and Eastern European countries, could trigger simultaneous bank failures if depreciation of the domestic currencies prevents unhedged borrowers from servicing the loans.
Allen and Carletti (2011) describe the systemic risk in economic literature. They distinguish at least four types of systemic risk. The first is banking panics. These are self-fulfilling multiple equilibria as modeled by Bryant (1980) and Diamond and Dybvig (1983).

Friedman and Schwartz (1963) suggest that this was the most important systemic risk. The second is asset price falls that lead to banking crises. There can be many reasons for asset price falls, including business cycle downturns as emphasized by Gorton (1988), the bursting of real estate bubbles, and sovereign default. The last two appear to be particularly important in the current subprime crisis. The third type of systemic risk is contagion in the banking system (Allen and Gale (2000a)) or in the payments system (Freixas, Parigi, and Rochet (2000)) that can lead to the collapse of the financial system. The fourth is foreign exchange mismatches in the banking system. These appear to have been at the heart of the 1997 Asian financial crisis. Herring and Wachter (1999), Reinhart and Rogoff (2009), and Crowe, Dell'Ariccia, Igan, and Rabanal (2011) have provided evidence that the most important source of systemic risk is the collapse of real estate prices. This has been true both historically and in the current, "subprime" crisis of 2008 year.

As Polish example from 2008-2013 shows that depreciation of domestic currency might be linked with downward trend in residential real estate prices. Thus, combination of depreciation of domestic property and simultaneous decrease of residential real estate price increase banking credit risk. In devaluation and real estate downturn environment, to sell residential property as a source of loan repayment does not function. It also requires more time to sale real estate and possible price will be lower than amount of credit due. Credit risk related to FCML loans can demonstrate in the following ways:

- default of borrowers (households) in loan repayments as result of unemployment or problems in business activity in case of self-employment (losing revenues), divorce, illness, addictions etc.
- legal bankruptcy of borrower (household). Such possibility has been seldom use due to complicated legal procedure related to personal bankruptcy in Poland;
- conflict between bank and borrower (household) in a form of borrower (household) refusal to increase banking collateral. Such possibility is always o mortgage loan covenant imposed in a mortgage loan agreement.

Borrowers (households) with FCML have been exposed to interest and foreign currency risk. Some banks, have been, in turn exposed to legal risk since determination of interest rate was not based on credible criteria as well as exchange rates.

Systemic risk is also rooted in banking asset and liabilities management. As like in Poland, long-term FCML are financed by short term liabilities. Duration of assets is far more higher

than duration of liabilities and cost of renewing liabilities might keep growing. Net interest margin of banks might be affect in an adverse way. Given the rising installments of FCML due to zloty depreciation shifting upward movement of rising liabilities' interest to the borrowers (household) is not always possible. Increase the FCML interest rate this way might put some borrowers (households) in default. Therefore, increase FCML's interest rate in line with increase cost of banks funding is not always possible. Thus, a lot of FCML portfolios in some banks might generate losses but this issue requires also further surveys.

Thus, foreign currency mortgage loans (FCML) pose a systemic risk from a 'common market shock' perspective. And third, systemic risk can develop in the form of informational spillovers when bad news about one financial institution increases the refinancing costs of the others, which in turn increases the probability of their own collapse. Yesin (2013) points to systemic risk arising from simultaneous exposure of financial institutions to a 'common market shock'. Since foreign currency loans are widespread on European banks' balance sheets, a sharp exchange rate movement can trigger, for example, defaults of domestic households on their foreign currency mortgagees, which could lead to a simultaneous deterioration of the banks' balance sheets.

4. FCML systemic risk measurement. IAS 39 and IBNR provision context

Yesin (2013) and earlier Ranciere, Tornell, and Vamvakidis (2010) quantify the systemic risk arising from the presence of the foreign currency loan (I would hereinafter call this risk category as FCML systemic risk) calculating the net foreign currency liabilities as a share of total assets, but excluding the "risky" foreign currency assets from the foreign currency assets. In other words, foreign currency loans given to the domestic non-banking sector are not included in total foreign currency assets. Thus, in a given country the foreign currency mismatch index in the banking sector is equal to net foreign-currency denominated liabilities plus unhedged foreign currency assets divided by total assets.

Foreign currency mismatch index = (FCY liabilities – (FCY assets - FCY loans to resident households and nonfinancial corporations)) / Total assets (1)

where FCY denotes foreign currency.

CHF mismatch index = (CHF liabilities – (CHF assets -CHF loans to resident households and nonfinancial corporations)) / Total assets (2)

Yesin (2013) proposes new approach to the indexes. Instead of using the share of foreign currency loans by *all* domestic borrowers, the share of foreign currency loans by domestic borrowers *with no foreign currency income* can be entered into the equation to derive a more precise measure of systemic risk. However, these data are not available in the CHF Lending in most Central and Eastern European countries.

Yesin (2013) findings indicate that the foreign currency mismatch indexes show persistence and low volatility during the recent year period. That is, short-term policies would be unable to swiftly reduce that systemic risk. Croatia and Hungary seem to be the countries mostly exposed to the banking systemic risk arising from FCML. Therefore, in those counties authorities have no choice but to introduce legal solution to tackle FCML problem.

Poland is exposed to FCML less than in Croatia and Hungary given the size of the population. The index quoted above should not be treated as the only FCML systemic risk measurement. To reflect the credit risk nature of FCML systemic risk, some other ways of measurements are needed. In this context, I propose Incured but not Not Reported Loss Provisions (IBNR) concept arising from IAS 39 but after certain modifications. Kabza (2014) points that countercyclical provisioning policy (dynamic) is a microeconomic tool to cope with systemic risk. IAS 39 is regulated in Poland by Polish Banking Supervision KNF special Recommendation R which has been recently changed.

Requirements set out in IAS 39 rests on grouping financial assets with similar credit risk characteristics, e.g. type of financial asset, industry, geographical, location, collateral type, past-due status and other relevant factors Calculation is based on probability of default (PD) and loss given default (LGD) for each portfolio:

Provision (Portfolio allowance) = Exposure x PD x LGD, with PD = 100% (3)

Formula (3) in banking practice is extended by LIP factor (Loss Identification Period):

Portfolio allowance = Exposure x PD x LGD x LIP, with PD < 100% (4)

LGD calculation might be also extended:

$$LGD = (1 - ZLGD) * [BD * 100\% + (1 - BD) * \max(1 - CRR / LTV, 0)] \quad (5)$$

where:

PD denotes Probability of default based on historical data (incurred loss approach),

LGD denotes Loss Given Default on single credit calculated over balance sheet exposure,

ZLGD denotes Zero Loss Given Defaul - default loans that cured themselves without any bank's action,

BD denotes Bad Debt – share of Loans with imperfect security,

CRR de notes Collateral Recovery Rate – part of collateral value that can be recovered including costs of enforcement,

LTV (Loan to Value).

In calculation presented above**,** additional variable, namely the loss identification period (LIP) has to be considered and added to the equation. LIP denotes time lag between actual loss event and observation of loss event by lender. Tentatively: LIP Minimum 6 months (factor: 6/12 = 0,5), maximum 12 months (factor: 12/12 = 1). Estimation of LIP is an individual bank portfolio specific matter. It can vary between various segments of credit portfolios (e.g. between retail and corporate portfolios). Banks need to provide evidence for the LIP used LIP also needs to take into account bank-specific review. Stress tests results checking if banks have appropriate capital buffers to withstand a shock of rapid local devaluation seem to be another measure of systemic risk arising from the presence of FCML in banking sector.

5. FCML exposure in the Polish banking sector. Data analysis. Results of portfolio provisioning model application

According to KNF (2015), the total volume of mortgage loans to Polish borrowers households total 375, bn PLN as of January 2015. Foreign currency mortgage loans total 174 bn PLN (54%). FCML in CHF accounts for 80% of total FCML. In January 2015, sharp increase exchange rate of CHF to PLN took place due to change of monetary policy of Swiss Central Bank which stopped keeping CHF exchange rate against euro on predefined level.

In Poland , according to KNF (2015) mortgage loans total 22% of total banking assets and 20% of GDP as of 2014. The said share of mortgage loans of total banking assets seem to be relatively high. There are some banks in Poland where this share is relatively higher. KNF (2015) suggests that quality of mortgage loans remained in acceptable problems (default loan share totals only 3.3% as of 2014 data)

KNF (2012) points that over 44 % of Polish mortgage loans have loan to value ratio (LTV) over 90%. Rapid PLN devaluation that took place on January 2015 has worsened this ratio in Polish banking sector. considerably especially in FCML. Households (borrowers) own in PLN to the banks more than when the loan was initially drawdown. KNF (2015) indicates that as of January 2015 there were 77 bn loans in CHF where LTV is above 80% . Those loans pose the greatest risk in Polish banking sector. If those borrowers defaulted and PLN further devalued against CHF , the overall annual loss would be in the range between 16 bn PLN to 28,7 bn PLN depending to PLN exchange rate CHF. LTV parameter affects directly LGD (Loss given default)/ which is one of the main credit risk parameters.

According to KNF (2015), the capital base of Polish banks is sufficient to amortize the loss arising to rapid further devaluation of PLN against CHF and to maintain Capital Adequacy Ratio on appropriate level in such scenario.

Banks approach towards LTV over 80% or over 100% is not standardized. The pending question is whether LTV over 100% means trigger event (default) in case of mortgage loans. in the context of IAS 39. If so another pending issue is to check the proportion in every bank how many borrowers will have negative equity having LTV over 100%. In case household have negative equity, there are no liquid assets in household, any personal problems of household means default. When LTV is over 100% negative equity has taken place , neither voluntary sale of the property or nor legal enforcement represents no solution since bank is not repaid in full and has a legal right to demand repayment the rest of the outstanding loan amount. Therefore, personal bankruptcy might be the only one option to sort out household indebtedness problem. Banks could also sell loan to securitization fund which is usually linked with loss for the bank as a loan seller. . Adequate level of provisions based on INBR concept developed by IAS 39 with respect for mortgage loans might serve as a cushion for such losses.

The current concept of IAS 39 of portfolio provisioning approach (portfolio allowance) does not necessary reflect the above mentioned characteristic of FCML in the Polish banking sector due to incurred loss principle. The real nature of households (borrowers) in Poland having LTV over 100% has not been fully investigated. The same imperfect knowledge issue concerns overall FCML borrowers. According to Czapiński (2015) the most well-off and relatively well-educated borrowers prevail in population of FCML borrowers, If so , the issue of negative home equity of households (borrower) is not so acute. On the other hand KNF

(2015) suggests that the real nature of mortgage borrowers in Poland is not fully known. Millward Brown (2015) survey suggests only 13% of Poles are able to save money. Ariadna and Agencja Badań Marketingowych (2015) after survey upon households (borrowers) in CHF in Poland indicates that 33% of such borrowers think they will not be able to repay CHF loans in the future. According to Ariadna and Agencja Badań Marketingowych (2015) point that 20,8% of CHF borrowers consider application for personal bankruptcy. If borrowers from low income brackets have been enticed to borrow in CHF Poland because of interest rate difference in favour of CHF loans, then reverse is true. Then, the negative home equity if LTV is over 100% represents a real problem in the Polish banking sector. Because the fact that the real profile of households (borrowers) is not fully known, it is difficult to assess credit risk parameters in INBR provisioning typical for FCML on the individual banking level. Therefore, the support of KNF is needed to make those parameters more credible.

Assuming

- LGD on 45% level and
- PD ranging from 2% to 20% might (20% of FCML borrowers might go into default status because of borrowers' application to personal bankruptcy),

cost Polish banking sector extra provisions might total between 5% to 50% of overall 2014 net profit of the whole banking sector. (0.8 bn to 8 bn PLN) LGD on the level of 45% assumed in credit risk standard method in Basel II is justified because actual change in residential market prices in Poland between 2008 and 2014 (prices were down around 30% especially in the secondary market) as well as lack of substantial savings by majority of Polish households. (Diagnoza Społeczna 2013 survey). In case of personal problems like job loss or losing clients by self-employed persons, Polish households (borrowers) could have no liquid assets to prepay or to further service mortgage loans using savings. The mitigation effect of shadow economy and money transfer from the Polish emigrants could be subject of further investigation. More and more Polish households might then consider to apply for personal bankruptcy since relevant law has been liberalized since January 2015. In 2015, the Resolution of Polish Constitutional Tribunal regarded that Polish banking enforcement privilege like banking enforcement titles (BTE) did not conform with Polish constitution. BTE used to facilitate collateral enforcement by banks in Poland. As the result of such Polish Constitutional Tribunal verdict , banks in Poland will find it more difficult to enforce property as loan collateral in the future as it used to be before the said resolution.

As Gaston and In Won Song point (2014) IAS 39 l leaves substantial room for judgment, which may result in insufficient provisions in the banks, especially if misapplied. Though IAS 39 specifies a series of observable data that can serve to support the objective evidence, it leaves room for judgment on a number of critical elements such as what constitutes objective evidence and how best to estimate future cash flows, especially when there is limited data. Banks have wide latitude in selecting relevant objective evidence. IAS 39 recognizes that loss estimates may lie within a range of possible losses and directs entities to select the best estimate within a range of possible losses. While the use of experienced judgment in part reflects the nature of financial reporting further elaborations and examples to clarify the meaning of 'objective evidence' is needed especially from Banking Supervisors. Banking Supervisors should assist banks in implementing IAS 39 and may improve the quantity and timeliness of provisions.

Changing IAS 39 philosophy which is now underway in the banking sector from incurred loss to expected loss might justified this more conservative approach towards extra provisioning on portfolio level including extra IBNR provisions. Before switching to expected loan concept in loan provisioning, KNF should predefined some credit risk parameters in IBNR models used by banks in provision creation just to give the banks some point of reference. When banks apply different credit risk parameters arising from their own credit portfolio characteristic , they have to have solid justifications to KNF and auditors to defend their set of credit risk parameters and loan loss provisions models according to IAS 39.

6. Possible FCML solutions. Materialization of systemic risk arising from FCML

Problems of FCML has been growing in CEE countries and in Spain. In Hungary 2011 there was a compulsory FCML revaluation program instigated by the law. FCML loans were converted into loans in Hungarian Forints using CHF exchange rate against Hungarian Forint as November 2014. Such move brought about losses in the banks operating in Hungary. In Croatia and in Poland borrowers started collective legal actions against bank. First verdicts has been positive for borrowers (households). Banks were accused of not revealing for borrowers (households) the whole nature of FCML especially foreign exchange and interest rate risk. Borrowers (households) have been not fully aware of the nature of FCML. Polish court questioned bank's discretion in determining FCML interest rate.

KNF (2013) has estimated potential costs of compulsory revaluation of FCML denominated in CHF into PLN using foreign exchange rate from the date of credit drawdown (as of 2008). No KNF's model's details have been revealed, especially future interest rate of mortgage loans in PLN after converting FCML them into mortgage loans in PLN According to KNF (2013) compulsory currency conversion would lead to decrease in banking assets and liabilities side would be the same. banking grouping of 80,1% of total deposits would be the subject of compulsory revaluation. Thus the joint net loss of Polish banking sector in that scenario would total 36.2 bn PLN . The capital base of the Polish banking sector would be lowered by 29.5% and three banks would lose the whole capital base and would become insolvent. Tier 1 in Polish banking sector would go down in this scenario by 31%. 7 banks would have Capital Adequacy Ratio below 8% and Polish Banking sector would be in need to recapitalization. KNF (2013) point to negative macroeconomic consequences of such compulsory conversion. According to KNF (2013) compulsory conversion would be also socially unjust because FCML borrowers have enjoyed lower costs of credit so far that offset devaluation of PLN against CHF. According to KNF (2013) Polish state should not prefer one group of borrowers (households) having FCML denominated in CHF over another.

FCML might be also solved by court resolutions. Polish civic code gives the courts a power to determine credit loans again when extraordinary conditions have taken place. Polish borrowers are planning next collective legal actions again least three banks. The banks spread revenues are questioned in such actions. Banks should not determine exchange rate on its own. Some other lawyers raised also the issue of lack of awareness of borrowers (households) of the nature of foreign exchange and interest rate risk. Borrowers (households) have been misinformed by the banks on risk aspects of FCML. Such legal actions are aimed at making FCML loan agreements completely invalid.

Polish personal bankruptcy law has been liberalized recently so borrowers (households) having FCML might apply to the courts to declare their bankruptcy and reduction of debt burden including the level of FCML. Such debt reduction might mean losses for banks as lenders in FCML.

In 2015, couple of proposals how to solve FCML problem in the Polish banking sector were put forward. KNF (2015) proposes conversion of FCML into mortgage loan in PLN. using exchange rate from the day of credit drawdown. The cost of such conversion will be divided between banks and borrowers, KNF increased also risk weigh related to FCML. Kabza (2014)

points that such increase is a typical step to deal with systemic risk arising from FCML loans in Central and Eastern Europe.

In turn, Polish Banking Association (ZBP, 2015) on the behalf of the Polish banks declares flexibility in restructuring of FCML and creation of two funds: the stabilization one and FCML Restructuring Support Fund with banks contribution totaling 300 mn PLN which is relatively moderate sum given the scale of FCML problem. ZBP does not envisage any debt reduction with respect to FCML. ZBP proposal seems to maintain a status quo and entails no significant financial extra burden for the banks. Extra provisioning by means of extra INBR provisions is not considered in that ZBP's proposal.

Were Polish banks better provisioned for FCML defaulted loans, their willingness to accept on case by case basis debt reduction restructuring proposal for individual borrower would be higher.

Given all those factors in mind, Czerkas (2015) proposes a complex solution how to tackle FCML problem in the Polish banking sector. That proposal is linked with extra provisioning in banks exposed to FCML after prior thorough investigation of real nature of FCML borrowers (households) in Poland. Such thorough investigation of the FCML borrowers including their current financial standing should lead to more credible credit risk parameters including PD, LGD, ZLGD . Polish Banking Supervision (KNF) should play a leading role in such process.

7. Conclusions

The issue of FCML's impact on condition of the Polish banking sector is far from being over and required further studies and modeling. The current nature of IAS 39 (incurred loss concept) in determining provisioning in Polish banks in retail segment does not reflect the real weight of the FCML problem and dynamic environment. Assuming that Polish banks are to create more provisions in the future when IAS 39 changes its nature from incurred loss to expected loss concept the real impact of FCML on bank profits and Capital Adequacy Ratio should be assessed in bank's stress tests using conservative PD and LGD. In case of significant negative impacts shown in such stress test, KNF might appeal to the shareholders of the banks for their recapitalization like in the heat of the subprime crisis.

Further research on complex solution how to tackle FCML problem in the Polish banking sector is needed. Any realistic solution is going to be is linked with extra provisioning after

thorough investigation of real nature of FCML borrowers in Poland (households) and their financial standing.

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