The impact of commercial real estate on the financial sector, its tracking by central banks and some recommendations for the macro-financial stability policy of central banks

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Abstract

This article reviews the impact of commercial real estate (CRE hereafter) on macro-financial stability and gives some ideas, how central banks could deal with the risk. First, we present the main features of the CRE market, explain its cycle and outline risks related to this market. Its relation to the financial sector is discussed. Further on, basing on the experience of some countries with CRE crises, we critically assess the reactions of their central banks. The characteristics of the CRE market are presented on the case of Poland, because it is a fast growing market. Its analysis should simplify the understanding why the CRE market should be tracked by the central bank. Finally, we present some ideas for the data collection and analysis of the CRE market. Further on, we provide some hints for the macroeconomic and financial stability policy of central banks, which should help to reduce risk and at the same time enhance the growth of the CRE market.

JEL Classification Numbers: E30, E44, E58, G28
Key words: Commercial Real Estate; macro-financial stability policy; banking sector; central banks;

1. Introduction

The commercial real estate sector plays an important role to the whole economy and a special one to the financial sector. The development of new financial instruments, indices and the relatively smooth cycle in the late 90's and early 2000' gave the impression that the commercial real estate market is relatively safe and immune to crashes. For example Mueller (2002, p. 125) stated: "Future real estate cycles should be more moderate due to restricted supply conditions and more rational capital markets that are led by better information, monitoring and feedback systems". He repeated his statement during a testimony in 2006 (see Mueller (2006, p.3)). Unfortunately, the recent crisis proved him wrong. Capital markets did not behave rational and new financial instruments helped to create a huge real estate bubble that burst and lead to a dramatic economic slowdown. It remains an open question whether this was only his opinion, or the broad view at that time, but the outbreak and the strength of the crisis indicates that most people were not aware of the threat that was building up. The crisis has shown that one cannot predict the future of the commercial real estate cycle, because it depends on macroeconomic and local factors, as well as on the behaviour of investors.

The global real estate bubble was able to emerge due to large global imbalances and loose monetary policy as Allen and Carletti (2011) state. The low interest rates, and also low returns on government bonds made loans on CRE absolutely and in relative terms very cheap. Financing costs and the opportunity costs of investing in CRE were low. Further on, investing in CRE wrongly appeared to be similarly save as government bonds.

Strong deregulation, international capital flows and low interest rates seem to be the main drivers of CRE price booms. The CRE market is highly capital intensive and depends strongly on external financing, thus can create significant risks to the banking sector. However, prudent regulations and an adequate monetary policy can make the commercial real estate cycle more smooth and mitigate the impact of the boom and bust episodes on the financial sector and the whole economy.

Some central banks, like the one of Sweden and England have tracked the market for a long time. Others, like the Central Bank of Ireland, started to put more emphasis on the CRE market only after the outbreak of the global financial crisis. Through a critical assessment of what central banks have done, or have not done, we learn that central banks need to keep track of the developments in the markets and need to react timely, in order to smooth the boom bust cycle. This article discusses the impact of the commercial real estate (CRE hereafter) on the financial sector stability and proposes lessons from past crises that might help central banks, policy makers and financial supervisors to deal with the risk it creates.

One important step in the analysis of the CRE market is the collection of data, and there is the need to make clear rules about the data collection (see for example the

Financial Stability Board and IMF 2009 report). Before one starts to collect data, it is necessary to understand which variables are needed and how to obtain them. Therefore, it is necessary to understand the relation between the CRE market, the economy and the financial system to be able to focus on those aspects of this market, which need to be tracked.

We start with an overview of the commercial real estate market and its strong links with the financial sector. Chapter 2 first points out the main characteristics of the real estate market and explains why bubbles emerge. The relation between the CRE market and the banking sector is presented. Further on, we review the literature on the linkage between CRE and macroeconomic stability. The anatomy of the real estate crises in Sweden, Denmark, Great Britain and Ireland and the reactions of the central banks are sketched in Chapter 3. In Chapter 4 we present the evolution of the fast growing CRE market in Poland, were we use our expert knowledge about the market. This should simplify the understanding of the CRE market characteristics and help to explain the need to analyse this market. Finally, Chapter 5 summarizes the findings of the previous chapters and gives some ideas for the data collection and misalignment analysis and hints for the macro-financial stability policy of central banks.

2. The commercial real estate market and financial stability

The CRE market consists mainly of office, retail and industrial space as well as of hotels. In many countries also housing, which is built in order to let it to tenants, is part of the CRE market. The main characteristic of the CRE market is that investors usually buy it in order to lease it to other economic entities. Because the income of this type of real estate depends highly on the business cycle, we observe large price swings in the market, which can finally lead to economic and banking crises. Breakdowns appear most likely when the global economy is slowing down. CRE cycles can be observed in almost all countries and in all times. Cycles are a normal part of economic growth, as long as they do not create excessive bubbles and later busts.

After the breakdown in the early 1990', the CRE market in most EU countries saw a strong growth in 2003-06, which was a result of economic growth at that time (ECB 2008a). The main accelerators of property price growth were, among others, financial innovations, easier credit conditions and international investors that were searching for yield. However, already at the beginning of the recent financial crisis CRE prices deteriorated and created serious problems for banks which financed them.

Investing in CRE can create significant profits for investors and banks who finance those projects. However, due to the large scale of the projects and the specific nature of their cycles, CRE can lead to huge losses and trigger financial and economic crises, as the history of the US, Sweden, the UK and in recent times in Denmark and Ireland shows. Investment in CRE is treated as relatively safe, both for the investor as well as for the financing bank. It is usually assumed that markets differ and thus the risk

can be diversified. However, Kearns and Woods (2006) present arguments which contradict this assumption. First, financial institutions might be involved solely in housing or CRE. Secondly, international evidence shows a strong correlation between different types of real estate in different countries. Markets, which are uncorrelated in normal times might be strongly correlated in moments of economic distress. Thus, the CRE market might pose a potential threat to the financial stability and should be monitored carefully by both central banks and supervisory authorities.

Financial crises and real estate crises might emerge independently, but they can be correlated, as Herring and Wachter (1999) state. Economic history tells us that crisis tend to emerge with different frequency and under very different economic conditions, both in highly developed countries as well as in developing ones. Whenever a crisis occurs, analysts and researchers try to identify their causes. But later on, even though central banks, other institutions and academics warn about potential problems that can arise in the CRE market, new crises tend to occur. According to Herring and Wachter (1999) this phenomenon has three reasons: overly optimistic investors, long construction lags and disaster myopia.

The market has no tools to stop excessive optimism. Even if some agents assume that prices will fall, they do not have the possibility of short-selling. Further on, managers get paid for short term results, which might strengthen their perception that they behave correctly. In this way they will continue to invest in CRE and its price will increase further, until it bursts at some point in time.

The construction process, which consists of choosing investment land, obtaining all permissions to build, and finally the construction of the building takes around two to six years. Due to this long lag between investment start and completion, excess supply might emerge, which investors will realise while the market is already in a downturn.

Moreover, *disaster myopia* adds to the creation of bubbles and their bursts. People can correctly assess the probability of frequently occurring events, but have problems with those which appear rarely. Busts in the CRE market occur quite infrequently, thus they are difficult to foresee and appear to be very unlikely. Further on, *disaster myopia* can make the crisis worse, when economic problems become visible. Banks might be worried by the economic downturn, thus restrict lending. The financial supervisor might increase capital and quality requirements of loans. In total this will result in reduced lending, which can slow down economic growth and further deteriorate the CRE market. As an example Herring and Wachter quote Litan (1992) who states that similar actions of the financial supervision authority deepened the west coast crisis in the US.

These factors can make banks and investors choose wrong strategies, which will be costly in the future. Additionally, the high profitability of investing in CRE might pose problems for the supervisory authority to restrict banks from investing in a business that appears to be highly profitable.

2.1 Commercial real estate market cycles and its linkages to the financial sector

The CRE market is strongly related to the business cycle and follows it quite closely. It is a local market with individual cycles, which are determined by local economic conditions, as Witten (1987) states. He states that supply is more volatile than demand, because it depends strongly on the financing opportunities and to a lesser extent on the market need. Further on, the commercial real estate market return, even though the market is local, depends strongly on the local and global economy, as empirical analysis performed by Case et al. (2000) shows. According to Mueller (2002) large cyclical swings in the property market can be explained by the fact that supply lags demand. When the economy is growing and space demand increases, it takes a while until newly started projects are finished. But when development production accelerates strongly, supply will continue even when demand declines, thus will exceed demand. Rents are of paramount importance for the investor and are subject to cyclicality. Their growth depends on how the current occupancy relates to the long term average occupancy (Mueller 1999). During the boom phase rental rates increase, while they decrease during the downturn. Kucharska-Stasiak (2002) points out that investors evaluate CRE prices basing on past transactions and also on the income they generated in the past. Also White (2008) states that investors tend to extrapolate recorded returns and do not consider the market risk in an appropriate way. This behaviour results in overestimation of their value during boom periods and its underestimation after a downturn appeared.

The special feature of CRE investment, as Bentick and Lewis (2003) argue is its irreversibility and, in comparison to machinery, the impossibility to move it. They also point out the long delay between orders and completion. Thus, CRE projects might be finished under very different economic conditions than they were started. Further on, the CRE market, similarly as any other asset market is affected by speculations and capital inflows, which are related to exchange rate appreciation, asset bubbles and euphoria (Bentick and Lewis 2003).

According to Ghysels et al. (2012) the real estate market differs from other financial markets in several ways: physical and locational attributes of a property make the market very heterogeneous; market participants face significant transaction and carrying costs and are confronted with illiquidity; the market heterogeneity creates significant search costs; finally, the lack of short selling makes it impossible to gain from expected price declines. One should add to this list the scale of an CRE project. Unlike in most businesses, it is hardly possible to start a project at a small scale and expand it, when the business is successful. Only in the case of retail and logistics it is possible to build a part of a retail or logistics park and expand it, when demand for space increases. However, in the case of office space or hotels, buildings need to be finished before they can be used by tenants.

The real estate cycle can be divided into its physical and financial part, as proposed by Mueller (1995). The physical cycle is determined by the relation of demand

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and supply, which affects rents. The financial cycle on the other hand, consists of capital flows that go to development projects or are used to buy existing objects, and which determine the price of a property. According to Mueller (1995) this distinction helps to understand the lag between occupancy and rent movements and the changes in real estate prices. The physical cycle moves along the business cycle in the following way. 1. During the recovery phase there is no new construction and vacancy is declining. 2. During the expansion phase vacancy still declines and new development projects are stared. 3. In the third phase, hyper supply appears, as new construction is stared while vacancy starts to increase. 4. In the final phase, the recession, vacancy continues to increase and more completions can be observed, as they result from projects which were started in the previous phase. When the cycle starts over, new completions that do not meet market demand hinder developers to start new construction.

Mueller (2002) analysed previous US property cycles and found that rapid economic growth lead to increases in office construction. But due to the time lag, supply exceeded actual demand, when completed buildings were delivered to the market. He concludes that overly optimistic demand projections explain the large oversupply.

On the financial cycle side, Mueller (2002) states that capital flows are the main determinant of property prices, and their inflow results in price increases. The public capital market plays an important role, as it gives access to capital, better data and accountability. However, the public market leads to price volatility and competes with other public market sectors for capital. For example, the underperformance of the stock and bond market in 2002 made capital to flow to the real estate sector, and Mueller (2002) expected, correctly as empirical evidence shows us today, that real estate prices will go up. Mueller (2002) concluded from US data that in the 1980' and 90' the financial cycle lagged the physical cycle by many years. But in the late 1990' and early 2000' the public market made the two cycles move more closer to each other.

The collapse of a local market might have a detrimental effect for the market in a distant country. For example, Peek and Rosengren (2000) found that during 1989-1996 the collapse of the Japanese real estate market had a significant deteriorating effect on the US commercial real estate market. Japanese banks, which had a large share in the US market, were forced to reduce lending to the US commercial real estate market. This shows us that even if the domestic financial system is sound, the construction sector can suffer from problems in foreign banks, if those who are active in a given country experience a large domestic property shock.

The recent burst of the bubble created significant problems to banks, which spread to the whole economy. Reinhart and Rogoff (2009) analysed past real estate crises and found that they have a lasting impact on the whole economy. Schwierz (2004) analysed the economic impact of the previous crises in the Nordic countries. He subtracted the economic loss that occurred due to the crisis from the gain in the boom period. The cumulative net loss in per cent of GDP was calculated as 12% for Mainland

Norway, 4% in Sweden and 10% in Finland. Jorda et al. (2011) analysed nearly 200 recessions that occurred in the world over the past 140 years. They found that the intensity of credit and the degree of leverage has an amplifying effect on the strength of the economic shock, in general.

This tells us that the CRE market and especially the leverage of loans needs to be watched carefully by the central bank and the supervisory authority. First, proper supervision can help to avoid the build-up of a bubbles that can lead to a crisis. Second, even if the bubble is somehow inevitable, its burst can be better predicted and steered towards a softer landing rather than a crash.

However, as Allen and Carletti (2011) state, most of the academic literature is convinced that central banks should not explicitly care about real estate or other asset prices. Most of central banks follow this idea, but one of few exceptions is the Bank of Sweden. Ingves (2007) from the Bank of Sweden explained in a speech that the central bank takes property prices into account in its monetary policy. It does not have a price target for houses or other assets, but reacts if prices and debt grow too much. Monetary policy can be used whenever it is necessary, but the central bank's public oral and written comments on the current developments are a much stronger instrument (Ingves 2007).

2.2 Linkage between banks and the commercial real estate sector

Commercial property is financed to a large extent by banks. According to Davis and Zhu (2011, p. 2) banks "lend for the purchase of land for development and existing buildings; they finance construction projects; they lend to non-banks and financial companies that may finance real state; and they lend to non-financial firms based on real estate collateral". This means that the willingness and ability of banks to lend significantly affects commercial real estate investment and transactions. At the same time, the property cycle has an impact on the performance of banks. Davis and Zhu (2009) found empirical evidence that when commercial real estate prices decline, non-performing loans increase, which negatively affects the balance sheet of banks and decreases their capital base. Thus, when commercial property prices decline, banks will lend less. This in turn will affect the overall economic activity negatively, and consequently demand for commercial property and their price will deteriorate further.

Davis and Zhu (2011) investigated the relationship between bank lending and commercial real estate prices. Their model states that macroeconomic shocks like GDP growth or interest rate changes affect property prices and bank lending. It indicates that credit supply has a positive effect on property prices in the short run, but will decrease them in the long run. GDP growth and falling interest rates should increase property prices. Further on, the theoretical model implies that property prices increase bank lending. Their empirical analysis, which covers 17 developed countries in the period 1970-2003, supports the implications of the theoretical model. However, as concerns the magnitude of the impact, property prices seem to affect bank lending much stronger

than bank lending affects property prices. Further on, Davis and Zhu (2011) find that around 47% of price variation is autonomous, while only 33% of credit is autonomous. The authors point out that the dynamics vary significantly among countries and different phases of the cycle. They stress the fact that bank managers and regulators need to understand the property cycle and detect its deviation from macroeconomic fundamentals. Davis and Zhu (2011) also point out that sound credit assessment, diversification across projects and adequate capital reserves are a necessary but not a sufficient condition to mitigate the shock, which a downturn in the property market can generate. They also conclude that commercial property, which is used as collateral, can lead to credit expansion if its price grows. In turn, the credit expansion can make the prices grow further. In order to prevent boom-bust cycles and deterioration of bank performance, banks have to be strict with their loan management. In any case, a prudent loan management has to base on reliable valuation of property, but the valuation process can be biased and lead to misleading results.

2.3 Problems related to the valuation of property

The proper valuation of CRE is very important for banks who grant loans and also for investors. According to analysis performed by Sivitanides et al. (2003) the market bases its decisions on current conditions instead of looking forward. We cannot easily force investors to behave more rational, but at least they should be able to get a clear and correct picture of the current situation.

Basically, two related problems arise as concerns the valuation of property. The first concerns the reliability and accuracy of the valuation of a single property. The second is the creation and usage of market indices. The two problems are strongly connected, because the market index is a composition of valuations of single properties, while market indices and their performance are used as a benchmark in the valuation of a single property.

The Central Bank of Ireland analysed the valuation procedures that were applied in Ireland before the outbreak of the crisis and found significant mistakes and shortcomings. Although they were explicitly detected for Ireland, we think that some or even many of them can be easily found in many other countries. According to the Central Bank of Ireland (2011a, p. 4) the main problems were "*1) inaccurate or inappropriate definition of valuation requirements by Credit Institutions and subsequent inadequate assessment and understanding of valuations received. 2) Inadequate valuation processes and standards or a disregard for adherence to such processes. 3) Lack of appreciation of the significance of the valuation document as independent evidence of risk mitigation effectiveness. Many bankers did not fully regard the valuation report as a key document underpinning the basis on which they were acquiring the risk.*" Those problems resulted from seven key weaknesses in the valuation process which the Central Bank of Ireland describes in details, but the most severe seem to be the following ones. First, banks were imprecise and presented

inappropriate assumptions when they asked for a valuation. Secondly, there was a conflict of interest and lenders accepted valuations that were ordered by the borrower. Thirdly, bank employees lacked the knowledge to properly understand the valuation and to question it or to make stress test as concerns the main assumptions on which the valuations based. Finally, banks waited as long as possible until they re-evaluated a property, which resulted in very outdated valuations of most property when the crisis broke out. As a result of those problems, the Central Bank of Ireland created a guidebook about the valuation process and requires banks to follow it.

Moreover, Crosby et al. (2004) found that in the UK lenders, borrowers and brokers were able to influence the choice of the valuer and also the outcome of the valuation process. A crucial role was played by the broker, who was continuously involved in the transaction process since its beginning and had a strong incentive to finalize the deal. Crosby, Hughes and Murdoch (2004) recommend that the lender, who takes the highest risk, should chose the valuer and also the control its actions. Especially, there might be a contract between the lender and the valuer, which defines the mutual rights and obligations.

We also outline some problems that concern the usage of property data and market indices. Battaglia et al. (2010) state that the property market is complex and functions under different regimes, which makes the adoption of a standardized data collection for different countries very difficult. They find that in Italy data on urban level and country level is not homogeneous. Further on, they find that different data sources apply different methods of data collection. The heterogeneity of methods leads to excessive discrepancy in data, such that it cannot be used easily for research or professional investment decisions.

A similar problem applies to the US indices. Wallace (2010) compared the NCREIF and the NAREIT[2] return index over the period 1991-2010. Beside the recent downturn, where both indexes behave similarly, they do not track peaks and downs in a similar way. Wallace concluded that such significant differences undermine their usability in analysing dynamics and it is even hard to get a good sense of the direction of the drift. She points out that both indices are subject to the index number problem, because neither the quality nor the composition of the real estate stock nor its price per unit is controlled for.

We sum up that the methodologies applied in the valuation process need to be harmonized and applied consequently by all market participants. Further on, even well-known and often used US indices might be biased and lead to imprecise if not even wrong inferences.

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[2] National Council of Real Estate Investment Fiduciaries (NCREIF NPI) and National Association of Real Investment Trust (NAREIT).

2.4 Covered bonds as a source of commercial real estate financing

Commercial real estate can be also financed with the use of covered bonds, and we sketch them briefly. Covered bonds were introduced in Germany in 1770 (called Pfandbriefe) and in Denmark in 1797 (called realkreditobligationer). In the case of Denmark covered bonds (CBs, hereafter) play a very important role in financing of real estate projects. We explain their main features, basing on a paper on CBs[3] by Packer et al. (2007). According to Packer et al. CBs became an important source of financing for mortgage lending and a major asset class in the European bond market in the recent years. Since the mid-1990' covered bond legislation was introduced in many European countries and in 2007 at least 20 countries were using them or were planning to use them. End of June 2007 data, presented by Packer et al., shows that the outstanding amount was around 800 bln euros in Germany, around 200 bln euros in Denmark and Spain, around 100 bln euros for France and around 300 bln euros for the remaining countries[4]. Banks are the main covered bonds investor and absorbed nearly half of issued bonds, while they absorbed only one quarter of asset backed securities. CBs appear to be quite safe, as legislative frameworks apply limits to LTV on loans (80% on housing and 60% on CRE, in general), as well as geographical and sometimes rating restrictions for public entities, which ensures the quality of the underlying assets. The legislation also impose minimum standards for the asset quality and ensures bankruptcy remoteness of the cover pool[5]. CBs are long-term, fixed rate instruments and are thus tailored to refinance fixed rate property mortgage, as Packer et al. (2007) conclude.

A study performed by Buchholst et al. (2010) shows that during the crisis covered bonds were nearly as liquid as government bonds, however both have seen some decline in liquidity.

Denmark finalised the implementation of the new CB legislation in accordance with the Capital Adequacy Directive in 2007 (Nielsen 2007). The sole right of mortgage-credit institutions to issue bonds was abolished and all banks could issue those bonds. Governor Nielson stated that this will help banks to fund their deposit deficits and should improve the financial stability. Further, the competition between banks and mortgage-credit institutions should increase.

Declines in CRE and property prices can create problems for lenders and for CB issuers. For example Danmarks Nationalbank (2011) stated that banks and financial institutions will need to top-up collateral on outstanding CBs, if property prices will decline. Banks and financial institutions would need to issue Junior Covered Bonds to top-up collateral, but those are much more riskier for investors than CBs. The top-up

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[3] Technical details on covered bonds can be found in ECB (2008b), ECBC (2011), Nykredit (2010) and DanskeBank (2010), with the last two focusing on Denmark.

[4] According to ECBC (2011) data, the outstanding amount of covered bonds in Germany declined to 640 bln euro, while it increased in Denmark to 330 bln euro. The total amount of outstanding CB's in the EU27 at the end of 2010 was 2336 bln euro, of which 72% were located in the real estate market and 24% in the public sector.

[5] This is done to ensure the cover pool value in case of bankruptcy of the originator.

will be higher than the price decline due to two reasons. First, loans that already require top-up will require even more of it. Secondly, the loan collateral requirements for many loans will be exceeded. According to Danmarks Nationalbank calculations, the potential required top-up in 2010 was significantly higher than in 2008. For example, a price fall of property prices in 2010 by 10% would result in a need for 100 bln krona, while the same decline would only require 25 bln krona in 2008.

2.5 The impact of the commercial real estate market on the stability of the financial system through banks

Analysis performed by central banks, international financial institutions and academic researchers shows a strong connection between the CRE market, the whole economy and the financial sector. In this chapter we present a selective overview of research papers, which focuses on the impact of CRE on the macroeconomic and financial stability of the economy. Because CRE is usually owned by professional investors, who are mainly interested in short term profits, large price swings can be observed. We thus present the impact of the CRE market on banks.

CRE requires a lot of financing, which is to a large extent provided by banks. At every stage of the investment process external financing is necessary and it is usually provided by banks. Kucharska-Stasiak (2006, p. 11) states that the large use of external financing, which can be observed in developed markets, has four reasons: risk is shifted to the lender; interest payments can be subtracted from taxable income (tax shield), thus make this form of financing cheaper; financial leverage; faster creation of a diversified portfolio.

Łaszek (2006) points out that banks amplify the CRE cycle by their credit supply, which either strengthens or decreases demand for real estate. But CRE financing can create risks to banks[6]. The three main risks are credit risk, interest rate risk and liquidity risk (Iwanowicz-Drozdowska 2004). Łaszek (2004) states that the classical factors that affect credit risk are the current situation of the borrower, his credibility (will to repay the debt) and the quality of the collateral. The proper valuation of the collateral plays a crucial role, because the LTV has to be determined correctly. The financing bank cannot rely only on the valuation performed by the investor, as it might be overly optimistic. Thus, the bank usually performs its own valuation. Kucharska-Stasiak (2006, p. 12) points at three major sources of risks in the evaluation process: the valuation method, the methodology that is applied in a given country and the valuation practice. The key point is to correctly assess the future stream of income that a given CRE will generate. Because, as mentioned earlier, future income is estimated on the basis of past observations, the valuation will be too optimistic in boom periods and too pessimistic in moments of downturn (Kucharska-Stasiak 2006). Further on, the strong

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[6] For example risks that arise to banks in Poland and ways to deal with them are presented, among others, by Kucharska-Stasiak (2006), Czerkas (2006) and Jajuga (2006).

heterogeneity of CRE makes it difficult to find a benchmark which will simplify the valuation process.

The CRE market is much more riskier for banks than the housing market (see a statement by Nyberg (2005), quoted by Woods (2007)). The CRE owner serves the debt with income, which the property generates. Contrary, in the housing market debt is served with personal income, which is usually not related to the commercial real estate or housing market. Further on, the housing owner has full liability and will lose his money if he defaults. In most cases the liability of the investor is limited and it is quite common that special purpose vehicles are used to acquire CRE.

The misconception that the CRE market is more stable than the housing market might result also from an inappropriate calculation of volatility of those property types. Wallace (2010) calculated the volatility of NCREIF and the de-levered firm-level REIT index over the period 1995-2005. The NCREIF index shows that multi-family housing is less volatile than CRE. However, the de-levered firm-level REIT index shows that office and retail volatility was on average by 50% higher than multi-family housing volatility.

Herring and Wachter point out another problem that arises from CRE for banks, as it can serve as collateral for other loans. Banks might give a loan to any industry and consider the risk of this industry in their risk evaluation, but use CRE as collateral. In such a situation banks do not only face the risk of the industry, but also the risk of the CRE market. Even if the price of the collateral remains constant, it might take a while until it is sold. During this time the collateral depreciates and will generate maintenance costs.

Beside the normal relations between banks and investors, we should also mention the possibility of *perverse incentives* (Herring and Wachter 1999). As stated before, investors tend to shift risk towards the lender, but the lender is not able to fully assess the risk. The investor knows that if he fails, the bank will have to bear losses. This might lead investors to take excessive risk.

Whitley and Windram (2003) analyse rents, bank loans, and economic indicators of firms that specialize in CRE, using data of around 1000 firms operating in the UK. Their model is quite simple and can be used to simulate the behaviour of the market. Empirical analysis covering the period 1989 Q1 – 2002 Q1 shows that credit grows when GDP exceeds its trend and CRE prices grow, while lagged LTV has a negative effect on credit growth. The model is able to explain credit growth until 1999, but then actual credit growth is much higher than would be predicted by market fundamentals. Further on, the authors present a model to assess the probability of default under different shock scenarios. When nominal interest rate rises by 1% over four years, the default probability increases by 12%. When CRE prices decline by 12%, the default probability increases by 8%. Finally, a fall of equity prices by 35% increases the investor's default probability by 5%. The increases in the default probability seem to be

rather small, however when the shocks occur simultaneously, the effect can be much more severe.

We see that there is a strong connection between banks and the real estate market. Because banks are the main source of financing in the CRE market, any problems of this market impact banks negatively. Central banks should monitor the market and intervene when it seems to be necessary. We move on and analyse, how the crisis emerged in some developed economies. The reactions of their central banks can teach some lessons that might be useful for banks.

3. Examples of commercial real estate market crises and a critical assessment of central bank reactions

In this chapter we present the main features of real estate and banking crises in Sweden, the United Kingdom and Ireland. The aim is to point out what lead to the crisis. Furthermore, we critically assess how central banks in those countries reacted and weather their actions were successful. We do not intend to criticise central banks but use their experience to point out problems and present efficient solutions to contain the crisis. One of the most severe mistakes was to focus solely on housing and ignoring the CRE market. The second mistake was a too soft approach of central banks and government to the problems. It is understandable that central banks have to be very careful in their statements, in order not to provoke a bust of a bubble or accelerate its bust, but some situations require strict and fast actions.

3.1.1 Sweden 1991-1993

The first real estate crisis occurred in Sweden in 1992-1993, which allows us to assess it from a time perspective. According to Englund (1999), the real estate boom resulted from the fast deregulation of the credit market and negative real interest rates. We summarize the main findings of Englund. Sweden observed a high inflation in the 1980's and interest rate payments were tax deductible, thus real interest rates were negative. The financial market was strongly regulated since the end of World War II, but in the period 1983-85 it was quickly deregulated. This resulted in a strong credit growth during 1986-90. It was immediately available to households, while firms could profit from it only later, in 1988-90. The capitalization rate in the CRE market, which was 10% in in 1980, fell to 7% in 1985 and finally to 4% in 1990. This was the result of speculation, which was possible after the deregulation. A similar growth of value could be observed in the housing market, and as Englund states, it was not supported by market fundamentals. Even in the spring of 1989 there were no signs of a crisis. Unemployment was at its minimum level and the currency appreciated by 15% in comparison to its 1982 value. Investment in housing in 1988-90 was around twice as large as in 1983-85. But in the autumn of 1989 the oversupply lead to increasing vacancy rates and the bubble burst.

Englund (1999) states that it became obvious that banks will have problems, but nothing pointed at the emergence of a financial crisis. Additionally, real after tax interest rates jumped from -1% in 1989 to +5% in 1991. This resulted from interest rate hikes in Germany and fiscal tightening in Sweden. In September 1990 the financial institution Nyckeln, which financed real estate loans, was not able to roll over its debt in form of new debt obligations. This spilled over to other institutions. Those which survived had to finance themselves through banks, which had no information about the loans those issued. Englund points out that suddenly banks were indirectly granting loans, which they previously did not want to grant. At the end of 1990 bank's credit losses amounted to 1% of loans and the figure rose to 3.5% in 1991 and finally to 7.5% in 1992. The total credit loss in the period 1990-93 amounted to 17%. Property prices decreased abruptly and losses on those assets accounted for around 40-50% of total bank losses. Two of the six largest banks needed recapitalization in the autumn of 1992 and other banks reported problems.

Only in 1992, when Gota bank failed, the government realized that a crisis was going on and treated it very seriously. Englund underlines important actions undertaken by the government: firstly, it saved quickly and with a large political support the deposits of clients; secondly, it did not save the shareholders.

The Swedish crisis was accompanied by the ERM crisis. More than 40% of loans were denominated in foreign currency, because of the significant disparity in interest rates. The crisis made it difficult for Swedish banks to obtain international financing. The Bank of Sweden started to raise interest rates in 1992 in order to support the exchange rate peg. Even though the overnight interest rate was raised to 500%, the exchange peg could not be sustained. The Swedish krona depreciated by 9% on 20 November 1992 and another 20% the day after. Englund finds that even though the fight for the peg was not successful, it allowed borrowers to hedge FX loans or even exchange them for krona denominated ones. Thus, the financial losses of the private sector that resulted from the depreciation were rather small. As a consequence of the crisis, a bank guarantee fund was established and the banking sector was able to exit the crisis. However, the crisis hit the real economy hard and during 1991-93 GDP declined by 5.1% and investment even by 35%.

3.1.2 Sweden after 1993

Since the crisis in the early 1990s the Bank of Sweden (BoS, hereafter) monitors the property market continuously and comments on the developments in its reports. The focus is on office space and apartment buildings, because those absorb the highest amount of capital. Around 40% of firm loans is located in CRE. We present the main statements of the financial stability reports to show how the BoS monitored the market and send signals to investors.

Already in the beginning of 2007 the BoS 1/2007 financial stability report stated that price growth in 2006 was much higher than rent growth. It pointed out that usually

property was built after initial lease agreements have been signed, but in 2006 offices in Stockholm were built without signed pre-let agreements. The declining capitalization rate could be the result of lower risk premium or market expectations of growing rents. The BoS stated at that time that rent developments were uncertain. However, the BoS also stated that bankruptcies were infrequent and they did not expect them to rise. We understand that the BoS noticed the tensions in the market, but did not see the incoming threat.

The BoS pointed out in the 1/2008 report that a large share of loans was located in CRE, which also serve as collateral. Falling rents could impair the repayment of debt and simultaneously deteriorate the value of the collateral. This in turn would hit banks. The BoS thus gave a warning to investors that their expectations about future rents can be too high. The report stated that the economy will slow down and rents might decline. Together with a rising risk aversion the risk premium will increase, thus property prices might fall. In total, the market liquidity will decline and prices might deteriorate further. The BoS gave a very clear signal to the market that it was aware of the CRE market problems and warned investors to be careful.

In the following 2/2008 report the increasing risk aversion and higher yield requirements were pointed out. The BoS stated that the quality of loans to real estate firms deteriorated and can deteriorate further, which can result in further price falls.

The 1/2009 report pointed out that property prices in Sweden declined, but not as much as in the UK ore Ireland. There were also threats that foreign banks will exit the CRE market. Investor's credit quality deteriorated. If Swedish banks cannot refinance CRE investors debt, investors will be forced to sell their property.

Fortunately, the situation improved at the end of 2010 and the 2/2010 BoS report stated that transactions, prices and rents grew again. The BoS expected that the situation will improve further. Indeed the 2011 reports have shown some optimism and stated that domestic and foreign investors started to invest, office prices rose and investor's credit quality improved.   Summing up, the financial stability reports show that the BoS was monitoring the CRE market very carefully. It gave clear signals to the market, which might have influenced investors and also banks in a positive way. Market participants surely remember the fast and strong reaction of the government and the BoS from the previous crisis, thus take verbal communication very serious.

3.2 Denmark

Denmark faces a real estate crisis which seems to be much more severe than the one of the early 1990'. Danmarks Nationalbank (2011) points out that Danish banks were strongly engaged in CRE, which lead to many bankruptcies as this market collapsed. Data presented by Danmarks Nationalbank shows a very strong increase of CRE prices and number of transactions in the years 2004-07. But since 2008 both the number of transactions and prices declined strongly. There were also many enforced transactions, which resulted from the bankruptcy of investors. Danmarks Nationalbank

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report stated that because it was difficult to obtain satisfying prices, it seems likely that banks and mortgage credit institutions that were creditors, acquired those CRE. Some institutions created special companies to manage those properties.

While this action might look fine in the short run, as it allowed banks to keep the prices of the collateral artificially high, it might create significant problems. First, keeping the properties as assets create costs to banks. Further on, banks are usually not experienced in managing properties. Finally, as long as banks will not sell the property, their ability to issue new loans will be restricted, which can have a detrimental effect on the growth of the Danish economy.

3.3 United Kingdom

We focus on the perception of the CRE market by the Bank of England and its communication with the world. Jenkinson (2006) from the Bank of England stated in a speech given already in November 2006 that the return in the CRE market was very high and exceeded its long run trend. This phenomenon was triggered by the search for yield that could be observed in the past years. He stated that shocks to the economy or the financial system were unlikely, however it is prudent to be prepared for such shocks. If they happen, market sentiment might change and the search for yield will end, financing conditions will deteriorate, prices decline and refinancing becomes more difficult. Jenkinson assessed such a scenario as unlikely, but concluded that market participants should be more careful when assessing risks.

The Bank of England monitors the CRE market for a long time, which it points out in its 2009 financial stability report. Also previous reports stressed that the involvement of banks in CRE can pose a significant risk to banks which finance it. The 2009 report mentioned that, according to IPD data, the value of CRE declined between June 2007 and July 2009 by 45%. This decline was much stronger than the decline observed in the beginning of the 1990'. The fall in prices lead to LTV deterioration and in some cases the collateral had a negative value. The Bank of England observed that the probability of CRE investors defaults increased. Firstly, vacancy rates increased while rents decreased, which deteriorated investors income. Secondly, investors will need to refinance their loans shortly, but banks might object to do so. Usually banks accepted LTV levels of at most 60-65%, which might force firms that invested in CRE to increase their capital.

The 2011 financial stability report stated that around half of bank's corporate borrowing was located in CRE. Even though there were some major risks to the market, banks continued to support their CRE clients. When the investor was able to serve interest payments with rent income, banks extended the maturity of loans and accepted higher LTV values than usual. Still, the Bank of England gave a clear warning. Basing on derivative contracts on the market, it stated that CRE prices, which in 2011 were around 35% lower than their peak in 2007, might fall by another 10-15% until 2014. Two thirds of property loans were secured against non-prime property, which price

might decline further. The Bank of England quoted Financial Services Authority estimates, according to which around half of the value of loans with delayed foreclosure had a negative net value. Concluding that CRE prices might deteriorate further, the Bank of England send a strong signal that it was aware of the problems in the CRE market and watches the market carefully. We can assess that the Bank of England was aware of the ongoing crisis and warned investors that prices might decline further.

3.4 Ireland

Ireland experienced structural economic changes that lead to rapid economic growth and fast evolution of the CRE market, which makes it a very interesting case to be studied. Moreover, similar to CEE countries, Ireland gained economic growth due to its EU membership and also due to the significant activity of multinational firms and foreign capital inflows. Thus, it seems to be a good benchmark for the analysis of threats from the CRE market to the economy in CEE countries and other small open economies. We briefly present the development of the economy and the real estate market since Ireland's EU accession until the outbreak of the crisis. Further on, we present a critical assessment of the reaction of the Central Bank of Ireland to the build-up of the property bubble.

3.4.1 The Irish economy

Ireland depended strongly on the UK economy and its GDP per capita was only 60% of the EU average until the late 1980s (Kelly 2010). But as a result of, among others, investment in education and infrastructure, liberalization of the labor market and also the strong growth of its trading partner, the UK, Ireland started to catch up with the EU[7]. Increasing employment was a key component of growth in the 1990s (see Honohan and Walsh 2002). Ireland reached EU levels in GDP per capita around 2000. Growth as well as employment continued to rise until 2007, even though the competitiveness was declining. The economic boom, as Kelly (2010) emphasises, was the result of a property bubble that was financed with credit. Its scale becomes obvious when lending is compared to GNP. In 1992 the non-financial loans amounted to about 60% of GNP, grew to 100% around 2004 and to 200% in mid-2008 (Kelly 2010). To give a comparison, the ratios in the UK were 80%, 95% and 104%, respectively. When securitised mortgages are considered, the total lending in Ireland amounted to 270% GNP in mid-2008. Kelly (2010) concludes that the credit boom lead to a price boom of both housing and commercial property. Prices of both kinds of property moved nearly in sync. The price peak in the CRE market was observed at the end of 2007, nearly one year after the peak in the housing market occurred. Kelly (2010) concludes that its

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[7] The growth of the Irish economy is presented in more details by O Grada and O'Rourke (1995) and by Honohan and Walsh (2002).

direct cause was the credit boom. Supply was fixed in the short run and in a rising market investors accepted as high as possible credits that banks were willing to supply.

Also Woods (2007) states that the real estate market grew strongly over 2003-06, but price increases were not accompanied by rent growths. This resulted later in abrupt price falls and a crisis of the financial sector. The Central Bank of Ireland (2010a) report concluded that due to the deteriorating economy and excessive involvement of the economy in the real estate sector, housing prices deteriorated already around 18 months before the collapse of Lehmann Brothers. The CRE price bust followed 9 months later. The report stresses the fact that property prices in Ireland had to decline at some point, as their growth continuously exceeded GDP growth. The collapse of Lehman Brothers and the global economic crisis only accelerated the process.

The reaction of the government and the regulators, even though the crisis was building up for around a year and a half, implies that they have been completely surprised, as Kelly (2010) points out. Moreover, the government decided during a meeting with banks to guarantee deposits and also all existing senior debt of Irish banks. Kelly emphasises that no other country beside Denmark declared to guarantee senior debt of banks and criticizes this step. First, it did not bring the expected effect, as shares of banks were declining and Anglo-Irish Bank had to be nationalized. Further on, the government could not share losses with bank bond owners. The government finally created a bad bank NAMA to acquire non-performing development credit from banks.

3.4.2 Reaction of the Central Bank of Ireland

The Central Bank of Ireland (2010a) stated in a report that it barely analysed and monitored the CRE market before 2006-07. However it points out that Kearns and Woods (2006) and Woods (2007) were warning about the strong price increases.

Kearns and Woods (2006), analysts of the Central Bank of Ireland (CBoI, hereafter), pointed out that banks in Ireland were strongly engaged in the financing of real estate, which might pose a threat to those banks. Their paper focuses on the housing market, but they also consider the CRE market in their analysis. They found a strong correlation of prices of office, retail, industrial and housing property over the period 1970-2005. CRE was subject to stronger price swings and followed the business cycle much stronger than housing property. Kearns and Woods (2006) also analysed the correlation of the Irish and UK property in the long run. Even though both economies were strongly connected, they did not find a strong correlation between the two property markets, neither in the housing market nor in the CRE market. They explain this phenomenon with differences in the monetary policy. While the Bank of England sets the interest rate according to the local economic conditions, Ireland has the same interest rates as the rest of the euro zone.

In the next financial stability report Woods (2007) investigated the price developments of CRE in Ireland and other developed economies. She found that

growing prices, which under stable rents indicate declining yields, could be observed in the European CRE market over the last 10 years. The strong price growth in 2003-06 was not supported by any structural changes, which could eventually lead to strong and abrupt price corrections. This in turn would hit banks by weakening their assets and increasing costs of write downs, as well as by decreasing their capital and their ability to supply credit. However, a properly conducted correction of the prices would have little negative effects. Woods stressed that around 42% of loans granted by banks to the commercial companies was used for CRE. Further on, she pointed out that although the CRE market can have much more severe consequences for the Irish financial stability, most research performed in Ireland focused on the housing market. This paper was not an official position of the CBoI, but we see that the central bank started to show interest in the CRE market in 2007 Q3.

In 2010 the CBoI (2010b) critically assessed its own actions prior to the crisis and found that although resources were limited, the CRE market should have been better monitored. Even though data from various sources was available at that time (for example those used by Woods (2007)), the CBoI did not consider it as reliable. Thus, it should have obtained, with the use of the FSA, detailed information from banks that grant CRE loans, but missed it. The CBoI also underlined in its report that the CRE market should be monitored, as its breakdown would lead to larger economic problems than the breakdown of the housing market.

In another report, the CBoI (2010a) announced extraordinary changes in the supervision of banks. It stated that over the last 10 years Irish banks were imprudent and prone to reckless lending. Their behaviour lead to a very costly financial crisis which needed to be resolved by the government. The CBoI concluded that it is necessary to monitor bank's behaviour and also track all important aspects of the CRE market. This requires the employment of professionals which have appropriate skills and commercial knowledge and will be able to monitor financial institutions. As a consequence to the poor application of valuation standards, the CBoI (2011a,b) created a mandatory guide on the appropriate valuation of property and a guideline on impairment provisions and disclosures.

A critical assessment of the action taken by the CBoI shows that it did not realize the threat that was building up. Even when its economists started to see some problems, the bank did not react. However after the crisis occurred, the central bank realised that monitoring of the CRE market is vital and requires employees which have the right skills. The CBoI has learned from the crisis and introduced clear rules on the assessment of the value of collateral. It warned market participants that it checks whether the proposed rules are applied and will sanction any breaking of the rules. By this action the CBoI showed that it has full control over the development of the property market.

4 The Polish CRE market in 1990-2011

We present the evolution of the Polish CRE market, which we consider as helpful in understanding the evolution of this market. First, it is a very fast growing market. Many multinational companies located their headquarters for the CEE region in Poland. Moreover, while highly developed markets have been analysed rather extensively in the literature, the Polish market is less known. We also see some analogy between Poland and Ireland, because economic growth was to a large extend created by foreign capital and was partly enforced by the EU accession. Another point is that a large share of CRE investment in Poland is performed by multinational investors. According to Cushman & Wakefield (2011) around 90% of CRE transactions in Poland in 2010 were performed by foreign investors, and their share was one of the highest among European countries. The low yields in Western Europe seem to play a crucial role for investors in the decision to invest in Poland. Moreover, foreign investors borrow largely abroad and national monetary policy has only little effect on them. However, the international investors have an effect on the price of CRE in Poland.

The CRE market emerged in Poland after the change of the political and economic system in 1989/90, but its growth accelerated only shortly before Poland joined the EU. We present its evolution basing on the NBP (2011a) annual report. Further on, basing on Wiśniewska (2006) and the NBP (2011a) report, the Warsaw office market, which is the largest market in Poland, is presented in some more details.

According to Cushman & Wakefield (2011) data, in the period 1997-2011 investment transactions in the CRE market in Poland amounted to 21 bln EUR, out of which 40% were invested in office space, 50% in retail space and the remaining part in logistic space and hotels. Those proportions changed, which resulted from the changing demand for different CRE types in given years (see the NBP (2011a) report for more details).

The analysed period can be divided into two main parts. In the first part, which covers the years 1997-2000 only few transactions were recorded. Only the year 2000 showed some increased transaction investment, which was nearly fully used for office space. After the year 2000 we observe a market cycle, which in the NBP report (2011a, p. 77,78) is divided into four phases: *"(1) gradually growing value of transactions in pre-accession years; (2) acceleration in the years close to the accession, with the highest level in 2006; (3) gradual drop in the years 2007–2008 under the intensifying financial market crises faced by many countries, to the lowest level of transactions in Poland in the year 2009; (4) rebound of the upward trend in 2010, when transactions of approx. EUR 2 billion were conducted (see: the data from the Report by Cushman & Wakefield, Marketbeat, Spring 2011)."* Data from Cushman & Wakefield indicate that in 2011 the investment transactions amounted to 2.5 bln EUR, among which more than a half was spend on office space. Around one third was invested in retail space and around one ninth in logistic space.

We would like to present the cycle of the Warsaw office market, because this is the largest and oldest CRE market in Poland and investors consider it to be developed and mature. The description of the evolution of this market in the years 1989-2000 bases on Wiśniewska (2006). The transformation that started in 1989 allowed for the growth of the services sector and also attracted foreign investors. Many multinational corporations located their headquarters for CEE in Warsaw. In consequence, the demand for office space increased rapidly. In the early 1990' office space was leased way before the building was completed. However, class A offices, which were highly demanded, were very rare. The lack of sufficient Polish capital and the strong risk aversion hindered a dynamic creation of new office space, as Wiśniewska states. In the years 1995-97 the vacancy rate was negligible (around 1%) which resulted in rents that were sometimes higher than in Western European capital cities. This in turn allowed the investors to obtain very high rates of return, which compensated the high risk. Later on a construction boom could be observed and property prices were still growing. The capitalization rate fell from 16,5% in 1993 to 11% in 2000, while at the same time it oscillated around 5% in Berlin and 6% in London (data collected by Wiśniewska (2006) from various sources).

The office market started to grow at a dynamic paste in the years 2000-2011, and only the financial crisis impeded its growth, as the analysis performer by the NBP (2011a) shows. The capitalization rates in the Central Business District (CBD hereafter) fell to around 8% in the beginning of 2005 and continued a downward trend, oscillating around 5-6% in 2007/08. The outbreak of the crisis resulted in sharp price declines, the capitalization rate increased to 8% at the beginning of 2008. However, the market recovered quite fast and already in the beginning of 2010 the capitalization rate fell again to below 7%. The CBD market showed a stronger dynamic of both rents and capitalization rates. Rents, which showed a slight upward trend in 2005-2008 outside of the CBD, were subject to small corrections. So far nothing indicates any significant problems of banks or investors.

4.1 Financing of CRE by banks in Poland

We take a look at the financing of CRE by banks in Poland. The situations seems to be relatively stable. It might be the result of the behaviour of banks, which contrary to their western peers are rather careful and apply prudent rules when granting CRE loans. However, according to Cyburt (2010), Polish banks wanted to compete with foreign banks and started to liberalize their credit requirements. They eased slightly the LTV ratios and also the need to have pre-lease agreements. But banks still analyse very carefully whether the investor will be able to repay debt. Further on, Polish banks try to minimize the risk and usually finance local CRE which does not exceed 50 mln EUR. Cyburt stated that larger investments were usually financed by foreign banks (from Germany, for example) or by real estate funds. Further on, banks join coalitions to finance larger projects, which allows them to share the risk.

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The structure of real estate bank loans to enterprises, which cover all types of CRE, shows that at the end of Q3 2011 the total loan amounted to around 40 bln PLN (around 9 bln EUR). Around 10 bln PLN were located in office building loans, while around 11 bln PLN were in housing construction loans.

Figure 1 – Structure (bln PLN, left axis) and quality (impaired loans ratio, right axis) of real estate bank loans for enterprises.
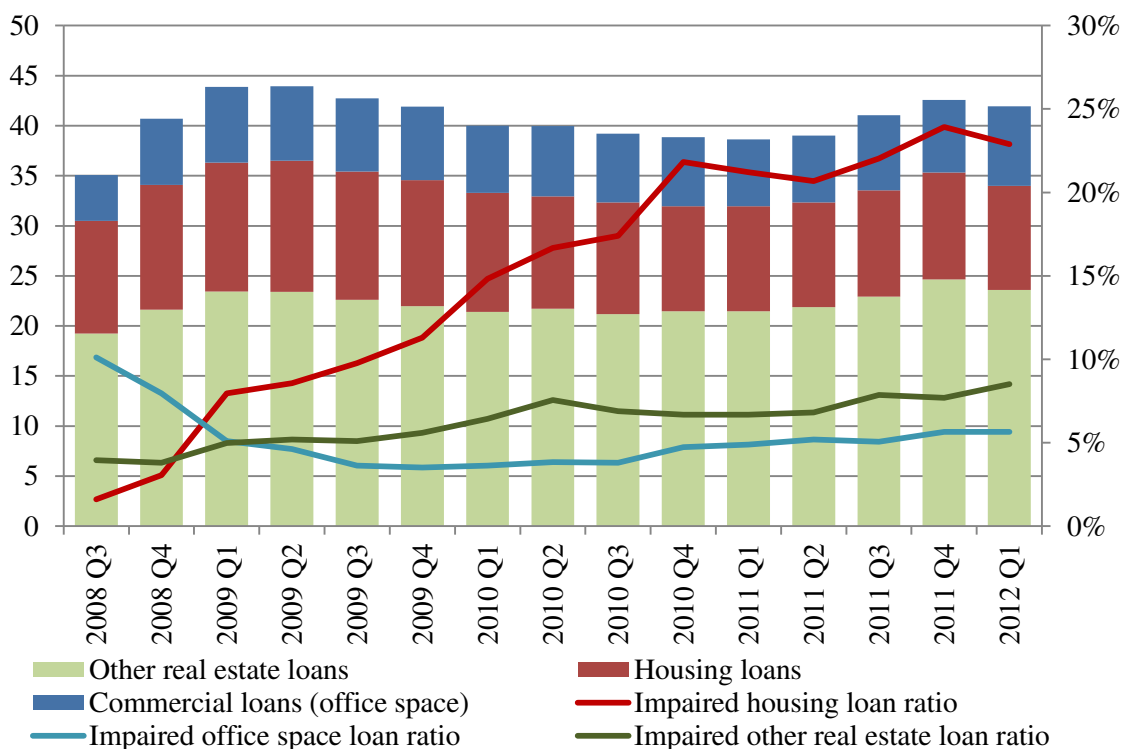
Source: NBP data, see NBP (2011c) and NBP (2012).

We can observe that the housing construction loan impairment ratio increased strongly after the outbreak of the crisis, while the quality of office loans remained stable. Also the quality of other real estate loans, which also covers CRE, seem not to have been affected by the crisis. At present the CRE loans seem to be relatively small – they amounted to 18% of firm loans and to 3.2% of bank assets (see NBP 2011c). Also in comparison to housing loans to households, which amounted to 310 bln PLN at that time, loans to CRE investors seem to be rather small. The reason is, as stated before, the strong involvement of foreign investors, which finance themselves abroad. But one can expect, that as the Polish economy will grow, more CRE investment will be performed by local investors, thus CRE financing by banks might increase.

Furthermore, the KPMG (2011) report shows that while banks were rather sceptical about CRE lending during 2007-10, their attitude towards CRE lending

improved in 2010-11. It is thus important to make banks base their decisions on prudent business models which take the macroeconomic risk into account.

To sum up, the NBP (2011a,b,c) reports show that the NBP is tracking the market carefully and analyses whether misalignments and tensions can be observed.

5 Some lessons from the past crisis concerning the macroprudential policy of central banks

In the previous chapters we showed that the CRE market requires supervision. We propose some ideas that might be helpful for central banks in developing or improving their macroprudential policy framework and also their data collection. The needed actions can be divided into three main groups. Those are data collection, the analysis of tensions and misalignments and finally proper policy and macroprudential actions. It is very useful to start to monitor the market when the tensions are not strong, in order to be prepared to act fast and effectively in case problems emerge.

5.1 Data collection

We describe the status quo of CRE data availability and propose some hints how the central bank and supervisory authority can obtain data. First and foremost (paraphrasing Mikołaj Kopernik) we need to know what we know and need to know what we do not know about the CRE market. Unlike assets that are publicly and frequently traded on the stock exchange, the CRE market is opaque, imperfect and transactions appear rarely. Usually, an unique source of data or one index like the FTSE or the CPI does not exist. The market is segmented and different firms collect specific data. There are some indices for the US market, but there are hardly any sophisticated indices for many other countries. Indices are usually tailored to specific markets, which operate under given conditions and their construction is somehow arbitrary. Therefore, existing indices cannot be easily applied to other markets. Further on, the index has to suit the needs of the policymaker and not just those of the investor. Every country should develop its own index, that internalizes the conditions under which the market operates. The central bank needs to obtain data. As concerns data quality, Smith and Wyatt (1996) point out that it needs to fulfil four conditions. Those are accuracy, completeness, currency and accessibility. It takes some hard work to collect and harmonize CRE data and get an objective view of the market.

Central banks and governments around the globe are searching for data on CRE which will help them to identify tensions in the market. The need to collect data and analyse the impact of CRE on financial stability emerged already in the late 1990's and in 2001 the IMF published a list of financial stability indicators that refer to the property market (see Heath 2003). However, until the recent crisis broke out surprisingly little has been done to push the analysis of commercial real estate and its impact on financial stability forward. One reason was probably the opacity of the CRE market and gaps in

data collection. In April 2009 the G20 asked the Financial Stability Board (FSB) and the IMF to point out which economic data is missing and to create a collection of necessary data. Among others, the FSB and IMF found that data on the CRE is needed and started to collect data (see FSB and IMF 2009, 2010, 2011a and 2011b). In 2011 the Inter-Secretariat Working Group on Price Statistics started to work on the creation of a *Commercial Real Estate Prices Handbook*. This task will be coordinated by the Eurostat (FSB and IMF 2011a). We are sure that this work will provide a strong step forward in the analysis of CRE risk to financial stability. However, the data collection methodology needs to be based on precisely defined needs of the users.

The ECB (2008a) report points out that even though risks that CRE might pose to the financial system are known, data for the whole EU is limited and not homogeneous. The Banking Supervision Committee together with the Working Group on Macroprudential Analysis conducted a thorough analysis of the market and its results can be found in ECB (2008). In that report the need to collect data about CRE and about the exposition of banks to CRE lending is pointed out. Since then the ECB monitors this market cyclically and analyses any risk that might emerge for the financial sector from the CRE market (see ECB 2010). Further on, Nordlund and Lundstrom (2011) state that the Bank of Sweden as well as commercial firms need precise and reliable data that will help to analyse the market and construct formal models. Those models will be used to give warnings about a potential build-up of risks in the CRE, construction and banking sector.

According to the ECB (2011) even in the case of euro area countries it is difficult to obtain data that allow for an analysis at the aggregate level. The ECB points out the fragmented and opaque nature of the CRE market and states that property values do not exist for most euro area countries. Moreover, long time series are not available. Further on, the existing indicators do not account for various tax regimes or supply elasticities, which makes international comparisons difficult. The ECB uses data from private sources and points out that it covers only major cities and only prime properties (see ECB 2011). It makes perfectly sense to cover major cities, as usually large amounts of CRE are concentrated in those areas. However, the sole analysis of prime property has some disadvantages. The definition of prime property is subject to changes. Those are not very large, but we have observed in Poland that some properties drop out from the coverage by professional agencies, if they do not fulfil certain standards. The question is, how to deal with such CRE when constructing a price or value index. The main concern is, whether the knowledge on prime property gives us any insight about secondary or tertiary property. For example, it seems likely that Polish banks and Polish investors are more engaged in secondary property rather primary property, which is dominated by foreign investors. But as little private sector information about secondary or tertiary properties is published, it is difficult to tell something about this market. Only when the relations between the markets are known, one can infer from prime CRE how secondary or tertiary CRE perform. Thus the NBP conducts its own research, to gain a

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more complete insight about the CRE market. The NBP obtains data from various advisory agencies and performs an own data collection, similar to the one that is applied in the housing market. The results can be found in NBP (2011a) and NBP (2011b).

To sum up, a good starting point is to use data from private international advisory companies. Moreover, the central bank might consider to start an own data collection.

5.2 Equilibrium and misalignment analysis

The prediction of property bubbles is a difficult task. However, Borio and Lowe (2002) show that the combination of credit growth and fast rising property prices can result in financial instability. We thus should investigate the development of credit and property prices and check carefully, whether those are in line with fundamentals. We present some ideas how to construct a measure of the CRE value and how to point out misalignments.

The creation of a value index is not always straightforward and many different models are applied (see Ghysels et al. (2012) for an overview). The German long-term income approach showed to be robust and can serve as a starting point. Further on, when data on rents, yields and space is available, one can use a very simple rule of thumb to estimate the value of the CRE market. As yield, in its simplest form, equals annual net rent income divided by property price, a very crude measure of a transaction based CRE value index can be obtained. When data availability makes it possible, more sophisticated CRE value measures should be constructed. Those would be basically a transaction based index and one that builds on the hedonic price approach. The misalignment analysis should be performed both in the short run and long run, because also a combination of short-term misalignments might result in severe problems to the whole economy.

The ECB (2011) performed recently an analysis about the relation of CRE market indicators to fundamentals. The fundamental variables were divided into two sets - macroeconomic conditions and indicators of future income streams. The former consists of overall GDP, private consumption and employment, as demand for office and retail space relies on those. The latter covers rents and initial yields. The analysed indicators were as follows: relation of capital value to 1) GDP, 2) private consumption, 3) employment, 4) rent and finally the yield. The average values of the indicators from the period Q1 1997 to Q3 2011 served as a benchmark[8]. The misalignment analysis was performed for Q1 2007 and Q3 2011. First, it showed that for all analysed euro zone countries in Q1 2007 the indicators were above average values. Secondly, those countries which showed an extreme disequilibrium in Q1 2007 (Ireland, Spain and Greece) showed also the strongest correction in Q3 2011, leading to values that were

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[8]   In the ECB analysis annual data from 1997 on was merged with quarterly data from Q1 2007. Annual data was interpolated to obtain quarterly data.

significantly below the average. However, as the ECB points out, data for those three countries started only in 2003, thus it covered only the boom period. Consequently the downturn appeared to be most severe. This exercise should give central banks countries a good set of information about their CRE market. It also shows that it is necessary to have as long as possible data and to choose a period, which reflects at least a full CRE cycle. Otherwise the results might be biased to either side.

5.3 Macroprudential and macrostability policy actions

The best policy is to steer the CRE market in a way, which strengthens its growth, but which does not allow for the creation of massive bubbles. The previously described misalignment analysis should help to identify tensions. However, in some cases there is no way to avoid a crisis. In such moments it is crucial to pick out the cause of problems, evaluate the losses and take actions to enforce macroeconomic stability and restructure the banking sector. A study by the IMF (1998) shows that countries who manage to react fast, usually also manage to exit the crisis quickly and successfully.

Zhu (2003) states that central bankers share the view that they have to react to excessive price growths[9]. However, it is difficult to say when the price growth is excessive. According to Zhu the lack of reliable data, heterogeneity of valuation methods and problems in forecasting the behaviour of the market in the future make it very difficult to create an early-warning system. He also mentions that monetary policy faces a difficult task when CRE prices grow, but inflation is low and the economy slows down. Thus he has doubts, whether monetary policy can be used to contain property prices. If the central bank decides to intervene, it has to choose the proper tools and the appropriate timing.

Monetary policy is usually not the right tool to prevent CRE bubbles, but it can be used to support macroprudential actions. The problem of monetary policy is that it affects the whole economy and could slow down economic growth, while the CRE market problem might be of local nature. Evans (2011) argued that in case the central bank tries to use monetary policy to contain bubbles, this might lead to more harm than good. Monetary policy is not a fine-tuning tool. Besides that, there is no benchmark or target, which tells how property prices should behave. He instead proposes to redesign regulations and improve market infrastructure in order to increase financial stability.

Allen and Carletti (2011) argue that monetary policy might work for homogeneous and medium sized countries like Sweden or the UK but is of little use for the euro zone or the US.

Most countries are indeed small, but there are two problems in applying monetary policy to stabilize the CRE market. First, modern CRE is located in large

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[9] Zhu (2003) performed also a study on determinants of CRE price cycles and their impact on monetary policy. His analysis shows that CRE prices depend on GDP growth, interest rates, credit growth and equity prices.

agglomerations, while monetary policy affects the whole country. There is a problem, which applies especially to the new EU member states in CEE. It is the so far dominant involvement of international investors and their access to international capital markets. We observed in the housing market that households in CEE financed their housing to a large extent with loans denominated in foreign currency (mostly CHF and later EUR), which had a lower interest rate than loans in local currency. Brzoza-Brzezina et al. (2010) analysed the behaviour of mortgage takers in CEE and found that they easily substitute domestic loans with foreign denominated ones. Monetary tightening decelerates domestic currency borrowing but accelerates that in foreign currency. They conclude that whenever domestic loans can be easily substituted with foreign denominated loans, the task of the central bank becomes more difficult. The same problem applies to businesses. Thus, a monetary tightening might have little effect on the CRE or will make investors to use financing in foreign currency. Under this situation, monetary tightening only slows down domestic economic growth. This might have a detrimental effect on occupancy ratios in CRE and thus undermine the ability of owners to serve the mortgage.

Posen (2009) states that monetary policy alone is not able to manage asset prices or to pop bubbles, and underlines the importance of macroprudential policy in solving this task. Also Allen and Rogoff (2011) state that monetary policy and macroprudential regulation need to be applied jointly in order to prevent property bubbles. Monetary policy and prudential policy are usually seen as complementary[10] (Borio and Shim 2007), and thus should enforce each other. In many countries the financial supervision works closely with the central bank or is even incorporated in the central bank. This allows central banks to look at the whole CRE market in a more complex way. The macroprudential framework, together with fiscal and monetary policy should be three pillars on which financial and macroeconomic stability can stand (Borio 2010). Fiscal policy, however, as argued in the literature is usually difficult to implement and takes a long while until it comes into force. We therefore need a complex macroprudential framework.

This macroprudential regulatory framework should, as Christensson et al. (2010) state, consist of three policy steps: 1. countercyclical regulatory policy; 2. control of contagion risk; 3. discretionary policies. The first step is to increase capital reserves of banks in times of growth and prosperity. Secondly, the supervisory authority should monitor important firms and analyse counterparty risk and the financial infrastructure. Thirdly, supervisors should intervene quickly, whenever imbalances are detected. This should in our view also be done by the central bank. Even simple verbal communication can be an efficient and successful tool to show market participants that the central bank, regulators and financial supervisors are aware of potential problems.

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[10] However, Borio and Shim (2007) point out that a holistic view of the problem is important, but the key role is played by monetary policy. It determines the expansion of liquidity, which can hinder the build-up of financial imbalances.

Further on, Allen and Carletti (2011) recommend, on the basis of their model, to introduce the following macroprudential policies to prevent real estate bubbles: 1. mandatory reduction in loan to value ratios; 2. increases in taxes on real estate transfers; 3. increases in real estate taxes; 4. direct restrictions on real estate lending. The first step is to decrease LTV values when prices increase quickly. The authors, however, point out that this measure might work for housing but not necessarily for CRE. In case of CRE firms might use "pyramids of companies that effectively increase leverage" (Allen and Carletti 2001, p. 22). The second tool could be transfer taxes which grow with the increase of price increases. The third would be higher property taxes, which make the ownership of real estate more costly and might thus reduce speculation. Finally, the authors recommend direct restrictions on lending in regions where prices are increasing too fast. The first two tools might be a good solution, but the third will be very difficult to implement.

In general, the macroprudential framework should be developed before prices start to accelerate. White (2008) states that there are examples of economic problems which have quite obvious policy solutions, but policymakers did not react until a crisis broke out. He gives two explanations for this phenomenon. First, the bureaucratic process takes some time. Secondly, those people who make money out of growing prices might use strong lobbying to stop any policy actions which might counteract the price growth.

We further would like to add that proper valuation of property is of paramount importance. It will restrict both investors and banks from running into a vicious cycle in which credit growth leads to property price growth and vice versa. In such a situation the LTV would be wrongly assessed as being safe, while in reality the property value would be far beyond what market fundamentals would imply. Prudent restrictions on LTV values and proper capital adequacy on property loans might help to reduce the likelihood of the emergence of a crisis, as Barrell et al. (2010) propose[11].

We conclude that the macro-financial stability policy has to be combined with regulatory policy and the fiscal policy. The literature shows that the monetary policy alone might be not enough to hinder CRE price booms. This is especially the case when real interest rates are low and the central bank might find it difficult to raise interest rates significantly, as this might lower economic growth and make the CRE downturn even more severe.

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[11] Barell et al. (2010) analysed a logit model for the probability that crisis emerge in OECD countries. They found that unweighted bank capital adequacy, bank liquidity and the evolution of property prices are much stronger indicators of an incoming crisis that the usually applied macroeconomic indicators as GDP growth, real interest rates or inflation.

5.4 Conclusions

The lessons that we have learned from the previous crises allow us to point out some main steps that might be useful for an efficient macro-financial policy framework of central banks:

- Prices of CRE in different market segments and different regions need to be tracked, as they might behave quite differently.
- A proper valuation method which suits the market characteristics and makes use of available data needs to be chosen and elaborated.
- A database which contains enough data to analyse the connection between the business-cycle and the CRE cycle would be very useful. This information will help to choose the appropriate monetary, regulatory and fiscal policy measures to allow the CRE market to grow but also to minimize the risk that might emerge from it.
- The central bank should give clear statements when it observes tensions in the CRE market. A clear communication can make investors aware of problems and help to mitigate them.
- Monetary, regulatory and fiscal policy needs to cooperate and enforce each other to prevent the creation of bubbles and allow the CRE market to grow safely.
- Finally, the central bank and government should be prepared how to react if problems occur. We have learned from Ireland that it was not prepared for the crisis, and further on, it announced unfortunately that it will save shareholders of banks. It would be much wiser, as the case the Sweden showed, to save only the deposits of clients. First, this is much cheaper, secondly it prevents investors from moral hazard.

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