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Relationships between the finance system and housing markets

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RELATIONSHIPS BETWEEN THE FINANCE SYSTEM AND HOUSING MARKETS

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Abstract: This study identifies the channels of impulse transmission from housing markets to the economy. Particular attention is paid to house prices, housing investments, the wealth effect and the financial accelerator. Furthermore, the author proves that the interior changes on the housing market occur earlier than the changes in the transactional prices of dwellings. This phenomenon results among all from the downward rigidity of prices. That is why, housing cycles should be identified as quantitative cycles rather than price cycles. In this approach, the author highlights the extended ascending phases of housing markets as particularly hazardous for the economy. Such extended ascending phases lead to abrupt and deep descending phases which, in turn, cause an economic slowdown and serious problems of the financial sector. Furthermore, the author of the study proves that financial markets cause the ascending phases of a housing cycle to extend. For that reason, this work offers an analysis of the development of the financial system in Europe conducted in comparison with global conditions, indication of the key determinants of this development, identification of housing investment finance mechanisms together with the assessment of the impact of these mechanisms on housing cycles. The sources of refinancing housing loans (mortgages) have been considered to be the main criterion differentiating the influence of the financial system on the housing sphere.

Key words: housing, housing finance, housing policy, housing cycles, housing boom

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1. Introduction
This paper undertakes a comparative study of relationships between the finance system and housing markets across the European Union countries. It includes comparative empirical explorations of the channels of transmission from financialisation before and after the last financial crisis. This work analyses the ways in which the financial crisis was transmitted between and within countries. The paper considers whether financialisation has tended to increase (price and/or volume) instability in housing markets and whether housing markets have been significant transmitters of the effects of the financial crisis.

To evaluate interactions between financial system and housing markets three theoretical models were used in this study. These are: Sławiński’s model [2006] adapted for housing purposes, Barras’ model [2009] and Leamer’s model [2007]. In these models five main economics effects are analyzed such as: Q Tobin effect, wealth effect, financial accelerator, expectations, downward stickiness of the dwelling prices. In the second part of this study housing cycles in the European Union member states in the years 1990-2013 were identified. Relationships presented within theoretical models take place in specific institutional structures of financial systems. These structures of housing investment financing, presented in this study, are composed of different mechanisms which allow credit institutions to obtain financial means for granting housing loans. Among these mechanisms the following have been analyzed: deposit mechanism, otherwise known as commercial banking mechanism, contract mechanism, mortgage banking mechanism and securitization mechanism. These mechanisms were evaluated in terms of strengthening or weakening cyclical fluctuations of housing markets.

Various comparative and descriptive research methods were used in this paper, such as: case-studies and non-parametric methods of cyclical component extraction, including frequency filters Christiano-Fitzgerald. Data sources for this study include the Eurostat database, national central statistical offices, ministries of construction and central banks.

2. Theoretical conceptions explaining the relationships between housing, financial system and the economy
There are three main conceptions concerning relationships between housing, financial system and the economy, taking especially into account the interaction in the direction of the housing sphere.
These are: Andrzej Sławiński’s conception [2006] adapted for housing purposes, Richard Barras’ conception [2009] and Edward Leamer’s conception [2007].

**Figure 1. Relationships between housing and the financial system in an economic cycle**

Sławiński [2006, p. 114] illustrates, on the basis of an economic model, the feedback between economic fluctuations and changes in house prices on financial markets (fig. 1). The author poses a question of why the course of economic events always falls in a similar sequence, a sequence which makes the changes in economic activity still be referred to as an economic cycle. Sławiński focuses on two factors: consumer moods and innovations causing higher work efficiency. The emergence of optimism among consumers or innovations brings about a growth in the rate of return expected by businesses. Simultaneously, there is a growth in investments and consumption, and in the longer run, a growth in the factors of production and interest rates. Such a situation leads to a higher likelihood of a decline in work efficiency or pessimism among investors, which brings about a threat of economic slowdown. According to Sławiński [2006, p. 113], a higher scope of cyclical economic
fluctuations is caused by feedback between economic fluctuations and changes in the prices of securities. This work offers an analysis of this feedback from the perspective of house price changes. A growth in work efficiency or consumer optimism are exemplary factors causing an increase in the rate of return expected by entrepreneurs. Sławiński’s conception [2006] does not clearly present the influence of the expected rate of return on the prices of assets. There are two phenomena, caused by a growth in house prices, emphasized in Sławiński’s conception: 1) an increase in housing investments, 2) a growth in consumption. Let us now take a closer look at these two channels of transmission of house price changes.

The first relationship concerns the influence of an increase in house prices on an increase in housing investments. This issue requires further explanation. In the simplest investment model, an enterprise makes a choice between selling its capital assets for a real market price \( p_K(t) \) or using it as real costs of capital use \( r_K(t) \). Maintaining the assets entails three kinds of expenditures for an enterprise: 1) the enterprise bears a real (alternative) cost per time unit \( r(t)p_K(t) \) - it loses the interest it would receive from selling capital assets and saving the sum received, where \( r(t) \) is a real interest rate, 2) the enterprise makes a loss due to capital exploitation – the cost of capital depreciation \( \delta p_K(t) \), 3) the enterprise makes a loss (profit) due to the change in the price of assets \( \pm \dot{p}_K(t) \), when the price of assets goes down, the enterprise bears a cost \(-\dot{p}_K(t)\). Thus, the real cost of capital exploitation amount to: \( r_K(t) = r(t)p_K(t) + \delta p_K(t) - \dot{p}_K(t) = \left[r(t) + \delta - \frac{\dot{p}_K(t)}{p_K(t)}\right]p_K(t) \). Taking into account the investment relief on the income tax, the real cost of capital exploitation takes the following form: \( r_K(t) = \left[r(t) + \delta - \frac{\dot{p}_K(t)}{p_K(t)}\right] (1 - f\tau)p_K(t) \), where: \( f \) – a fraction of investment expenditures of an enterprise which lowers its taxable income, and a fraction of revenue from selling capital goods which increases the taxable income of an enterprise, \( \tau \) – marginal income tax rate. The model requires some modifications in order to adapt it to actual investment decisions, including in particular the costs of changing capital stock and expectations concerning demand and expenditures [cf. Romer 2000, pp. 379-385]. This modified approach is referred to as the investment model of the Tobin’s q theory. An enterprise increases the amount of its assets when the market value of the capital’s unit \( q \) is higher than the costs of its production, and it loses the assets when the market value of the capital is lower than the cost of its production. A

\[1\] Explanation: in dot denotation, a dot over the sign means a differential of the given expression to the independent variable.
growth in company's assets by one unit increases the current value of its income by $q$, and consequently increases the value of the company by $q$. The company wants to expand the scope of its assets when $q$ is high, and reduce it when $q$ is low. The company continues investing until the cost of obtaining capital increased by the marginal cost of adaptation equals the market value of the capital's unit, $q$. When the cost of obtaining capital assets equals 1, then $q$ means also a relationship between the market value of the capital's unit and the cost of its replacement, which is called \textit{Tobin's q ratio} [Tobin, 1969]. The marginal $q$ is defined as a change in the company's market value divided by the change in its capital assets, which causes a change in the market value. When the value of marginal $q$ is higher than 1, the company's market value is higher than the costs of capital replacement. Following Bond and Cummins (2001), including the contribution made by Hayashi [1982] concerning the assumption of regular revenues in adjustment costs or, in other words, a constant scale effect ($q_{\text{marginal}}=q_{\text{average}}$), the investment equation may be written down as: 

\[
\left( \frac{l_t}{K_t} \right) = a + \frac{1}{b} \frac{V_t}{(1-\delta)p_tK_{t-1}} - 1 + e_t = a + \frac{1}{b} Q_t + e_t
\]

where: $l_t/K_t$ – investments to capital ratio, $K_t$ – capital stock, $l_t$ – gross investments in period $t$, $p_t$ – capital goods price in period $t$, $V_t$ – company’s market value estimated on the basis of the income approach, discounted cash flows techniques, $e_t$ – error remainder reflecting the adaptation of the expenditure shock to noticed by companies, but indefinable for econometrists, $(1-\delta)p_tK_{t-1}$ – replacement cost of capital in period $t$, which the enterprise possesses from the previous period. Thus, the greater the relationship between the company's market value and replacement costs of capital is, the larger the investments to capital ratio is. Tobin's q ratio may also be analyzed in relation to housing investments. House prices on the secondary market must be equal to the current value of discounted rents obtained or possible to obtain from real estate, including the expected changes in the real estate value. When Tobin's q is higher than 1, housing investments appear, the growth rate of which is higher than joined rates of population growth and stock depreciation, which brings about an increase in the total housing stock. Obviously, the adaptation time is longer than the period of physical construction of residential buildings, since it is necessary to purchase an adequate investment area, obtain construction permits, and adapt the company internally to new investments [Topel, Rosen, 1988; Schulz, Werwatz, 2011]. In the long run, it is assumed that the increase in demand for dwellings will cause a decline in real house prices and convergence of the q ratio to unity. Despite the clarity and considerable application possibilities of Tobin’s q ratio, it must be stressed that its applications in
the housing sphere are relatively meager, even though the author of the conception himself suggested applying it in this area [Fettig 1996]. The housing construction function on the basis of DiPasquaule and Wheaton’s models [1992, 1994, 1996] was in fact based on Tobin’s q ratio. Housing investments appeared when house prices were higher than the costs of their construction. The results of empirical research, conducted in particular by such authors as: Takala and Tuomala [1990], Jud and Winkler [2003], Berg and Berger [2006], corroborate the importance of Tobin’s q as a variable explaining the changes in housing investments in Finland, the United States and Sweden respectively. It is also worth mentioning an interesting cognitive approach of Jud and Winkler [2003], who studied the relationship between house prices on primary and secondary markets as a factor determining the change in housing investments. For example, when homes on the primary market are cheaper than those on the secondary market, consumers purchase more dwellings from the primary market than those from the secondary market. In such a case, assuming the competitiveness of the housing construction sector, housing investments on the primary market grow [Jud and Winkler, 2003, p. 381]. A remark made by Topel and Rosen [1988] that Tobin’s q ratio depends on the assumption of shortsighted expectations seems justified in this research area. Thus, it is assumed in the model that investors compare current house prices with the current marginal cost of production while taking their investments decisions. Unfortunately, short-term supply is usually less flexible than the long-term one, due to, e.g. the transfer time of means of production [Kydland, Prescott 1982]². That is why, expectations concerning the shape of house prices in the future are of key importance for taking investments decisions at present. Thus, it seems justified to include in the study not only the current Tobin’s q ratio but also its past value, and on this basis examine its influence on housing investments [Summers 1980, Jud and Winkler, 2003, Schulz, Werwatz 2011].

The second relationship concerns the influence of house prices on the growth in consumption. This phenomenon is called the wealth effect and it may be analyzed on the basis of two platforms, i.e. from the perspective of models based on a budget constraint or from the perspective of models based on the consumption function. In the former case, we shall highlight two approaches: Cambell and Mankiw’s [1989] and Lettau and Ludvigson’s [2001]. These authors proved that there is some cointegration between consumption, income and wealth structure. Assuming

² In empirical research, long-term elasticity of housing investment prices amounted to 1.6 to 3.7 [cf. Poterba 1984; Topel, Rosen 1988; DiPasquale, Wheaton, 1994; Blackley 1999].
consumers’ rational expectations, the gap which appears between the variables under analysis and the level of long-term equilibrium will provide information, not only about future consumption values but also about the price of assets, including information about income and the price of residential real estate [Lettau, Ludvigson, 2004]. Transforming the budget constraint equation, in which total assets consist of the sum of observable assets and human capital, Cambell and Mankiw [1989] proved that the relationship between consumption and total wealth provides information about the shape of future consumption and asset prices, following the formula: \( c_t - w_t \approx E_t \sum_{k=1}^{\infty} \rho_w^k (r_{t+k}^w - \Delta c_{t+k}) \). where: \( c_t \) – consumption logarithm, \( w_t \) – total wealth logarithm, \( r_t \) – logarithm of gross return rate on wealth, assuming that \( \rho_w \equiv 1 - \exp(\bar{c} - \bar{w}) \). A problem arises when it comes to measuring human capital, and thus measuring total wealth [cf. Chauvin, Damette, 2010, p. 265]. Nonetheless, Lettau and Ludvigson [2001] provide a solution to this issue, formulating an assuming that the participation \( \omega \) of measurable asset values \( a_t \) in total wealth is constant, and an average return on assets constitutes a weighted average return on individual components of assets. Furthermore, the authors assumed that the non-stationary component of human capital may be estimated by using aggregate income \( Y_t \). Consequently, Lettau and Ludvigson came up with an equation: \( cay_t \equiv c_t - \omega a_t - (1 - \omega)y_t \approx E_t \sum_{k=1}^{\infty} \rho_w^k (\omega r_{t+k}^a + (1 - \omega) r_{t+k}^h - \Delta c_{t+k}) + (1 - \omega)z_t \), where \( z_t \) is a stationary variable with zero average. Generally speaking, the models based on budget constraints refer to the term of consumer flexibility towards total wealth, providing an answer to the question of how much will consumption change when total wealth changes by one percent. In the latter case, i.e. models based on the consumption function, we shall begin by making a reference to Friedman’s [1957] permanent-income hypothesis and the life cycle theory of consumption [Modigliani, Brumberg, 1954; Ando, Modigliani, 1963; Modigliani, 1975]. In the case when a consumer expects his income to grow through the years, he or she will incur liabilities while they are young and redeem them when they are older, based on the consumption smoothing principle. It is generally assumed that a consumer avoids rapid consumption fluctuations. In the case when consumers are about to suffer a temporary decrease in income, they draw on their savings or incur debts, whereas in the case of an expected temporary increase in income, they save or redeem repays debts. Thus, consumption has become the most stable component of aggregate demand. The only exception is when consumers expect permanent changes in their income. In such a case, there is a reduction in consumption, which usually comes first before an anticipated reduction in income. Thus, current consumption depends on the expected value of current and future income.
obtained by consumers. In brief, consumption depends on physical wealth, which maps the repercussions of income changes in each period and from current income, following the formula:

\[
C_t = \frac{W_t}{\kappa} = \frac{A_t + W_h}{\kappa} = \frac{A_t}{\kappa} + \frac{Y_t}{\kappa}
\]

where: \( C_t \) – consumption, \( W_t \) – total wealth, \( A_t \) – physical wealth, assets, \( W_h \) – human capital, \( Y_t \) – current income, \( \kappa \) - coefficient \( z \) of the range from \( \frac{1}{10} \) to \( \frac{1}{3} \), according to theoretical models [Altissimo et al., 2005].

Generally speaking, the approach based on consumption function reflects an increase in the marginal propensity to consume due to a growth in marginal total wealth [cf. Chauvin, Damette, 2010, p. 267]. Let us examine a few more crucial aspects within this area. First of all, current income has been included in the consumption function due to the fact that many people are unable to raise loans to smooth their consumption, although they might assume obtaining larger income in the future. In such a case, there may appear the phenomenon of credit rationing, i.e. a refusal to grant loans to those who may potentially obtain larger income in the future. For those people, a key condition for the value of consumption is their disposable income, with an interest rate influencing consumption in an indirect way, through physical wealth [cf. Burda, Wyplosz, 2000]. Secondly, a change in house prices may not necessarily affect consumption, and may only bring about a process of wealth redistribution between unit owners and occupants (or between current and future unit owners). According to Chauvin and Damette [2010, p. 266], a source of the wealth effect will be the speculative bubble effect on the residential real estate market, causing an uneven distribution of wealth. Muellbauer [2008], on the other hand, stressed the necessity of including the process of liberalization of financial systems in the study on consumption changes in the face of growing house prices. According to this author, the process of financial liberalization results in both an expansion of housing loans availability and a reduction in own financial contributions required of first-time buyers in order to incur a housing loan. When the value of own contributions have decreased for first-time buyers with mortgages, a growth in house prices will result in the necessity for these consumers to save in order to purchase a dwelling, consequently leading to a decline in consumption. As a result of reducing own contributions, the impact of the price growth on the growth in consumption will be positive. According to Muellbauer’s [2008, s. 314] research, the marginal propensity to consume, caused by a growth in housing assets by one percent, amounted to 3 percent in the United Kingdom and approximately 6 percent in the United States. This difference, according to Muellbauer, is caused above all by the different pace of liberalization of
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financial systems in the two countries. Table 1 presents the results from analyzing the wealth effect in the EU member states.

Table 1. Wealth effect research results

<table>
<thead>
<tr>
<th>Authors’ names and research results publication dates</th>
<th>Research subject (country)</th>
<th>Research time span</th>
<th>Growth in consumption caused by a growth in housing assets by a unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slacalek, 2009</td>
<td>Denmark</td>
<td>1q.1977-1q.2004</td>
<td>0,1733</td>
</tr>
<tr>
<td>Slacalek, 2009</td>
<td>Finland</td>
<td>1q.1979 - 1q.2003</td>
<td>0,1815</td>
</tr>
<tr>
<td>Chauvin, Damette, 2010</td>
<td>France</td>
<td>1987 - 2006</td>
<td>0,027-0,043</td>
</tr>
<tr>
<td>Slacalek, 2009</td>
<td>Ireland</td>
<td>4q.1975 – 4q.1996</td>
<td>0,0915</td>
</tr>
<tr>
<td>Sastre, Fernandez, 2010</td>
<td>Spain</td>
<td>1q.1987 - 4q.2007</td>
<td>0,01-0,02</td>
</tr>
<tr>
<td>Catte et al., 2004</td>
<td>Netherlands</td>
<td>1m.1981 - 1m.2003</td>
<td>0,08</td>
</tr>
<tr>
<td>Slacalek, 2009</td>
<td>UK</td>
<td>1q.1970 - 4q.2003</td>
<td>0,0695</td>
</tr>
<tr>
<td>Basanetti, Zollino, 2010</td>
<td>Italy</td>
<td>1q.1980 - 4q.2008</td>
<td>0,015-0,02</td>
</tr>
</tbody>
</table>

The growth in house prices, housing investments and consumption is also facilitated by the financial accelerator [Bernanke, Gertler, Gilchrist 1994; Kiyotaki, Moore 1997], i.e. a feedback between the state of the economy and the value of credit lending. Improving economy means a smaller risk of business bankruptcy, which induces credit institutions to grant a larger number of business loans [Sławinski, 2006, p. 115]. Consequently, the volume of investments increases, leading to higher economic activity and liquidity in the following periods, which strengthens and spreads the initial process. Additionally, a source of gross wealth changes is procyclical changes in asset prices [Kiyotaki, Moore, 1997]. An increase in house prices results in greater creditworthiness of businesses and households, since housing assets constitute collateral against taken out mortgages. At the same time, the volume of housing investments increases, followed by an increase in housing assets, which strengthens and intensifies economic revival to an even greater degree.

Growing production costs (inflation pressure) and increasing interest rates by the central bank, in a modified Sławinski’s [2006] model, cause a decrease in an expected rate of return on housing investments. Consumers’ moods worsen, the pace of production efficiency growth may be inhibited, which will lead to a slowdown in an expected pace of real wages growth. The economic situation will deteriorate even further, due to a decline in house prices, bringing about two other phenomena: a drop in investments and a drop in consumption. The negative changes in the net wealth of businesses and households stimulate the phenomenon of financial acceleration. This time, negative intensifying forces strengthen themselves, which results in unfavorable fluctuations of real
values in the economy. According to Sławiński [2006, p.115], after some time, the economy will recover from recession, since the decrease in wages will bring about higher production profitability. This process is accompanied by reducing the interest rate by the central bank for fear of deflation [Sławiński, 2006, p. 116, more in Błaszczyk, 2010].

In sum, an advantage of the modified Sławiński’s [2006] model is the fact that it indicates strong connections between the housing sphere and the financial system and the economy. These relationships are highlighted by Tobin’s q ratio, the wealth effect and the financial accelerator included in the model. The main axis of the model is house prices, which determine the process of changes in housing investments, consumption, housing loans. However, the modified Sławiński’s [2006] model also has a few drawbacks, such as: it draws on the static approach, it does not take into consideration the expectations or other housing market parameters, apart from prices and investments (uninhabited spaces, cost of home ownership, housing stock), it does not take into account the issues of downward rigidity of prices and wages.

Barras [2009], drawing on the conception of Schumpeter, made at attempt at presenting the connections between the housing market, financial system and the economy. The author used a classical approach to cyclical fluctuations in the economy. The mechanism of cyclical fluctuations is presented in figure 2.

In the stage of economic revival, a growth in production and wages brings about a growth in demand for residential real estates. Uninhabited residential units fall below the level of long-term equilibrium, and rent rates gradually begin to grow. There occurs the first investment wave, associated with the initiation of new investments in real estate, with an accompanying phenomenon of credit expansion, which leads to an increase in aggregate demand through the multiplier effect. Due to the fact that there is a considerable lag between the preparation and realization of construction investments and their conclusion, there is no growth in short-term supply of real estate, which further accelerates the growth in prices and rents [See more: Barras, 2009, p. 81].

In the stage of economic boom, demand for real estate is very high, with a simultaneous growth in house prices and rent rates as well as with a positive assessment of the perspectives for the economic situation and the real estate market in the future. A rapid growth in real estate values leads to higher securities and, consequently, brings about a new wave of investments in real estate construction. During this time, the investments from the first wave are concluded, generating higher real estate supply, with the pressure for lowering prices and rents and with higher production
capacity of the economy. Next finished real estate investments, which appear on the market, cause prices and rents to lower. The profitability of developer’s undertakings drop, and construction costs go up. Consequently, the trend in housing investment is reversed, which means that these investments begin to decline [Barras, 2009, p. 81].

During an economic crisis, caused by overshooting consumer’s demand, there occurs inflation pressure, which causes a growth in interest rates and tightening of credit supply, which further limits investments in real estate. Inhibiting investments, including investments in real estate, leads to an even larger decline in aggregate demand due to the investment multiplier. The necessity to conclude the already-started real estate investments, results in a growing number of uninhabited spaces, which become harder and harder to sell. Rents and house prices go down, leading to a decrease in the value of assets, and due to the accelerator effect, leading to further reduction in mortgage loan granting. The supply of newly-built estates gradually goes down and the rate of uninhabited spaces stabilizes itself, yet above the level of long-term equilibrium [Barras, 2009, p. 81].

During recession, demand for new real estate is mostly limited to replacing the depreciated stock. A complete inhibition of credit lending curbs new investments in real estate. Some developers have remained with unoccupied residential units, some real estate owners are now unable to repay due installments of their debts, whose interest rate has gone up. That is why, there are mass bankruptcies and real estate takeovers. Simultaneously, construction costs begin to decrease, the rate of uninhabited units slowly but gradually goes down, and rents and real estate prices begin to stabilize at a level that is much lower than in long-term equilibrium. The occurrence of expectations concerning a future growth in rents means a transition to the next real estate cycle [Barras, 2009, p. 82].

Barras’s [2009] model depicts the connections between the housing sphere and the financial system as well as the economy. It refers to a spider-web model, i.e. to the so-called ‘pork cycle’, assuming that the uninformed market participants make systematic mistakes in their forecasts concerning the functioning of the real estate market in the future. Fluctuations on the real estate market result above all from lags in the investment process. Nonetheless, Barras’s [2009] model does not take into account the expectations, it includes the capitalization rate only indirectly in cash flows, it does not include the wealth effect, it is not affected by the issue of downward rigidity of prices and wages.
Figure 2. Cyclical fluctuation of the housing market, financial system and the economy

Real economy

Revival

Growth in demand for real estate

Falling vacancy

Growth in rents

Increase in new investments

Boom

Construction boom

Higher construction costs

Real estate market

Higher supply of flats and lower demand

Rising vacancy

Lower rents and more profits

Decline in new investments

Crisis

Recession

Housing market crash

Financial system

Credit expansion

Credit boom

Financial constraints

Multiplier +

Multiplier -

Accelerator +

Accelerator -

Source: Based on Barras [2009, p. 80].
The third conception under discussion, which connects the housing sphere with the financial system and the economy, belongs to Leamer [2007]. This conception is presented in a descriptive form, without a graphical representation. The axis of the author’s reflections is the hypothesis that a housing cycle is a quantitative cycle, and not a price cycle [Leamer, 2007, p. 177]. According to Leamer, predicting economic crises requires coordinating the investment process within the construction sector. This coordination is extremely difficult to carry out, since monetary policy is practically ineffective. It can only affect the time lag of housing investments, yet it is not able to change the volume of housing investments.

According to Leamer, eight out of ten recessions in the United States were associated with serious problems within the residential real estate sector [2007, p. 164]. Following the author’s studies, this sector contributed to an exceptional weakening of the GDP for two years or a year prior to an economic crisis, simultaneously being the first sector of the economy to recover from the crisis. House prices are clearly sticky-down, which means that when housing demand goes down, it is the number of dwellings and not their prices that is adjusted. Consequently, the decline in the number of sold units is accompanied by a decrease in employment in the construction sector and other related sectors, which is reflected by the decline in the GDP. Obviously, the appreciation of the housing stock value and the growth in transactional prices of dwellings may affect consumption expenditures only through the above-presented effects of financial availability or wealth. Leamer proves that a normal level of house sale occurs only when the purchasers are sure that house prices will probably regularly go up, or at least will not go down. In numerous locations, there are many unwilling purchasers who think that they will gain more if they wait. In such a case, there occurs a slowdown on the housing market below the long-term trend, but house prices do not adapt to new market conditions, thus inhibiting the normal level of house sale in a relatively short time and with a normal level of price appreciation. Downward stickiness of house prices cause the volume of housing investments to change abruptly, bringing about significant repercussions for the economy by strengthening the phenomenon of an economic crisis [Leamer, 2007, p. 178].

Downward stickiness of house prices causes lags in the housing market’s recovery to equilibrium. Leamer [2007, p. 184] sees an explanation for this process more in the psychological sphere rather than the economic one. According to him, downward stickiness of house prices stems above all from the phenomenon of time preference and an inclination to avoid failure. Time preference manifests itself in sellers’ and buyers behavior. The owners do not want to sell their
homes during the slowdown period, which causes house prices to remain at a relatively high level, with a considerable reduction in the number of sold dwellings. The sellers expect the sale price to be similar to that of the previous revival period (adaptation expectations), while prospective buyers expect the current house price to reflect the market value of a dwelling from a future slowdown period (rational expectations). On the other hand, the term inclination to avoid failure refers to behavioral economics. It assumes among all that entity’s behavior is shaped under the influence of strong stimulation and inhibition mechanisms [Klawczuk, Poszewiecki, 2010, p. 17]. Under this approach, the value of a dwelling is perceived not as the market value but as an individual value for a given owner. Thus, until the dwelling is sold, the owner feels that it is worth the same amount as he or she paid for it.

To sum up Leamer’s [2007] conception, we shall highlight that this author drew our attention to the importance of a housing cycle. Until then, research focused solely on examining house price fluctuations, and paid little attention to the volume of housing investments. Despite the fact that housing investments contribute to a minor degree to the long-term economic growth rate, they constitute a major factor deepening the upcoming economic crisis. Leamer’s research conclusions are of key importance for practical purposes. For instance, reducing fluctuations amplitudes in quantitative housing cycles would result in calmer economic cycles. Furthermore, Leamer noticed that housing investments are the first factor of the Gross Domestic Product which helps the economy recover from a crisis. According to Leamer, as early as in the second quarter of an economic crisis housing investments contribute to strengthening the economy. It means that the housing sector may play the role of a stimulant of the economic situation, facilitating the economy’s recovery from a crisis.

Apart from the above-presented detailed descriptions of qualitative models connecting the housing sphere with the financial system and the economy, we shall also look at the achievements of other researchers within quantitative modeling, using for this mathematical and econometric instruments. Especially worth mentioning here are the works of Greenwood and Hecowitz [1991], Gomme, Kydland and Rupert [2001], Davis and Heathcote [2005], Fisher [2007], Iacoviello and Neri [2010]. These authors make attempts at connecting housing investments with other economic variables, especially by analyzing the housing investments’ replies to demand and supply shocks, but they do not give an insight into the functioning of housing markets, e.g. they do not distinguish between owners and occupants, they do not take into consideration transactional costs or the cost
of home ownership. Greenwood and Hercowitz's [1991] model, which is based on Becker's [1965] conception of allocation of time, emphasizes the procyclicality of housing investments in an economic cycle and their significance for cyclical fluctuations in the economy. Gomme, Kydland and Rupert [2001], on the other hand, include in the model the time aspect in the investment process, drawing on the Cobb–Douglas function. Thanks to such an approach, unlike in the Greenwood and Hercowitz's [1991] model, housing investments become here a variable which exceeds economic cycles and they are positively correlated with market investments defined as nonresidential structures and equipment. The research results under discussion refer to Davis and Heathcote [2005], who created a multi-sector growth model including construction, manufacturing and services. Residential investments are twice as volatile as other investments and exceed economic fluctuations, while non-residential investments constitute a lag variable. The authors explain high volatility of housing investments with slow depreciation of the housing stock and high volatility of the construction sector productivity as well as labor consumption of the construction process. Slow depreciation of the housing stock causes construction production to focus on new investments in the period of relative high productivity. Labor consumption of the construction process, on the other hand, causes construction production to grow relatively fast, without waiting for capital availability. Davis and Heathcote naturally stress that the accessibility of investment land for new residential investments acts like an adjustment cost, which reduces residential investment cyclical volatility [2005, p. 780].

A supplement to Davis and Heathcote’s conclusions, concerning the factors determining the phenomenon of residential investments exceeding economic cycles, is a model presented by Fisher, revising the theory of real economic cycles [2001, updated 2007]. According to Fisher, the above-mentioned exceeding takes place in a situation when the households’ capital (dwellings) is useful enough for market production. Thus, it may constitute the same factor of production as labor and financial capital. Fisher [2007, pp. 142-144] proves that workers are more efficient when they live in high-standard homes (which refers here to living space) and in homes located nearby their workplaces. It stems among all from the quality of leisure and the possibility of relaxation after work. Thus, households’ capital contributes to the production of market and housing goods. When the capital is complementary in relation to labor and the capital in market production, there is a

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3 Similar research was conducted by Scott Hacker [1999] on the basis of the 1989 data for Poland. He proved that the growth in the ratio of employees to rooms was accompanied by a growth in work efficiency.
strong incentive to realize residential investments first, and only then realize other economic investments [Fisher, 2007, p. 143].

It seems that the above reflections may be best summarized with the conclusions from the most-advanced DSGE model, introduced by Iacoviello and Neri [2010]. Housing investments and house prices are extremely volatile, procyclically strong and incredibly sensitive to monetary shocks. According to the authors, long-term growths in house prices result from a slow technological advancement in the construction sector and from land being a factor of production. The authors claim that demand and supply shocks explain in one-fourth the cyclical fluctuations of housing investments and house prices. Monetary factors explain approximately 15-20% of variable cyclicality on the housing market [2010, pp. 2-28]. Iacoviello and Neri emphasise the fact that the repercussions of various events in the housing sphere leak into the economy mainly through consumption, through the collateral effect of loans granted to households. It stems from a dynamic development of the financial system, which increased the marginal availability of financial resources [2010, pp. 26-27].

The microeconomic bases of the functioning of housing markets are included in the econometric studies of such authors as: Gervais [2002], Fernandez-Villaverde and Krueger [2004], Chambers, Garriga and Schlagenhauf [2009], Díaz and Luengo-Prado [2010]. According to Iacoviello [2011], the presented studies are more suitable for analyzing debts, risk or wealth distribution than for analyzing the reaction of housing markets to aggregate economic shocks. Gervais’s [2002] model analyzes disruptions caused by preferential taxation of owner-occupied homes (no taxation of hidden rents understood as income streams generated by owner-occupied homes and the possibility of including mortgage loan interest in income tax). Additionally, the author analyzes the influence of tax preference of the structure of the capital stock and its repercussions for long-term prosperity [Gervais, 2002, p. 1462]. Preference taxation of owner-occupied stock causes a change in individual choices concerning occupation made by households, which is also reflected in Chambers, Garriga and Schlagenhauf’s [2009] model. The participation of owner-occupied homes and homes with larger floor space increases in the total housing stock. The return rate on housing capital becomes higher than the return rate on business capital. Consequently, we can notice the effect of displacing the business capital with housing capital [cf. Hendershott, Hu, 1983; Poterba, 1984]. The overconsumption of housing services appears, since income on hidden rents is taxed less than other capital income [Gervais, 2002, p. 1463, cf. Poterba, 1984; Gahvari, 1984; Berkovec, Fullerton, 1992].
Naturally, lifting tax reliefs connected with the sphere of owner-occupied homes causes an increase in the segment of homes for rent, even though the value of the total housing capital remains unchanged [Gervais, 2002, p. 1463]. Gervais’s depiction also suggests that the relationships between the form of taxation of the housing sphere and the form of ownership constitute a significant transmission channel which causes disruptions in households’ consumption and savings [2002, p. 1463]. Of key importance for this channel is the value of own contribution required to incur a housing loan. When households overcome this constraint (i.e. they manage to put aside an own contribution and purchase an owner-occupied home), we notice a rapid growth in consumption. This phenomenon is further strengthened by the existence of tax preference [2002, p. 1477].

Fernandez-Villaverde and Krueger [2004], on the other hand, focus on the life-cycle model. Their research suggests that the main priority for households, in the initial stage of their mature life, is cumulating housing assets, and cumulating financial assets begins only at the age of 40 plus. Two other authors – Díaz and Luengo-Prado [2010] – analyze the structure of the households’ wealth. They conclude that the participation of dwellings in total wealth decreases together with a decline in the value of total wealth. Furthermore, housing assets of lower-middle class and middle class citizens constitute a considerable part of total wealth, whereas for the upper-middle class, housing assets constitute merely one-fifth of the total wealth value. Nonetheless, housing assets are not as concentrated as financial assets, which actually concern only the richest segment of the society. Lowering own contributions while financing real estate purchases with mortgage loans, causes a growth in the house ownership rate and a decrease in the disproportion of housing assets, with a simultaneous increase in the concentration of financial assets. That is why, the influence of this phenomenon on the total wealth effect seems insignificant [2010, p. 162].

The works of Silos [2007], Fisher and Gervais [2007], Kiyotaki, Michaelides and Nikolov [2011], Campbell and Hercowitz [2005] as well as Iacoviello and Pavan [2011] all contain studies binding the approaches presented above. Connections between aggregate shocks and housing decisions are the basis for Silos’s [2007] research. At the same time, Fisher and Gervais [2007] analyze the influence of demographic and income changes on housing investments. Furthermore, mutual relationships between house prices, the economy and limitations concerning loan availability are the basis for Kiyotaki, Michaelides and Nikolov’s [2011] analysis. Campbell and Hercowitz’s [2005] studies, on the other hand, draw our attention to the influence of financial innovations, i.e. deepening of financing, and on cyclical fluctuations in the economy. Additionally,
Iacoviello and Pavan [2011] highlight the importance of residential investment changes for economic fluctuations, especially their procyclical behavior corresponding with the procyclicality of households’ mortgage indebtedness. According to these authors, a growth in households’ wage volatility and a reduction in own contributions required to purchase a dwelling with a mortgage loan will, first of all, reduce the volatility of residential investments and secondly, reduce the correlation between mortgage indebtedness and economic condition [2011, p. 10]. In the former case, the home ownership rate will go down, since a higher risk connected with future income will result in consumers’ reluctance to buy fixed assets, which are difficult to liquidate in case of financial problems. A lower ownership rate should bring about higher volatility of residential investments, yet this phenomenon is depreciated with the owners’ reluctance to change housing consumption. In the latter case, both the home ownership rate and the level of households’ mortgage indebtedness go up. This larger participation of home owners causes smaller investments needs. Additionally, indebted owners tend to reduce their working hours due to a positive technological shock, and thus their participation soothes aggregate shocks [2011, p. 10].

Contemporary studies on housing cycles are dominated by analyses of transmission channels of shocks between the real sphere and the financial sphere. Research works depicting the relationships between the residential real estate sector and the economy, including the influence of financial systems, are quite sophisticated, especially when it comes to their instruments. However, it seems that there still remains certain insufficiency concerning the presentation of key cause-and-effect relationships between the real sphere and the financial sphere in an economic cycle. Furthermore, mathematical models which constitute a product of all these works have been verified with the use of econometric instruments mainly based on time series referring to the economy of the United States. It seems justified to claim that this situation results primarily from the unavailability of detailed historical data for other world economies.

Sławiński's [2006] model, modified for housing purposes, depicted two main transmission channels of house price growth, i.e. the influence of house prices on the increase in housing investments and consumption. Furthermore, the financial accelerator, which caused a dynamic and relatively long-term growth in house prices, serves as a valuable supplement to those transmission channels. Leamer [2007] draws our attention to the phenomenon of downward stickiness of house prices, which increases the amplitude of housing investment fluctuations, and thus leads to an increase in the costs of adjusting the housing market to the long-term equilibrium. Leamer found an
explanation for this phenomenon in behavioral economics, one research area which is the inclination to avoid failure. The main thesis of the author is to define housing market cyclical fluctuations as a quantitative and not price cycle. Unfortunately, it was house prices which determined primarily the scale of credit expansion, which created an additional imbalance in the housing sector. The above relation is compatible with the model presented by Barras [2009].

Conclusions from the econometric research completed the conception of connections between the housing market, financial system and the economy. Let us bring back the contribution of such authors as Davis and Heathcote [2005], who stressed changeable efficiency in building and high labor consumption of the investment process, as the elements influencing investment cyclical fluctuations and their exceeding the changes in the economy. Iacoviello and Neri [2010], on the other hand, emphasize that long-term house price growths result from a slow technological progress in the construction sector and from the presence of land as a factor of production. Gervais [2002] draws our attention to the fact that the disruptions caused by a preference tax on owner-occupied homes, which cause crowding out business capital by housing capital and disruptions in households’ consumption and savings. Two other authors – Díaz and Luengo-Prado [2010] – highlight that housing assets are not so much concentrated as financial assets, which actually only concerns the wealthiest part of the society. It means that changes in housing assets will have significant repercussions for the economy. In 1990-2007, the housing loan debt began to grow rapidly in the EU countries, accompanied by an increase in credit institutions involvement in the residential real estate market. The basis for this expansion was the process of globalization and liberalization of capital flows, strengthened by the activities of the People’s Republic of China, with a declining capacity of national states to effectively influence market processes and excessively expansive monetary policy in the United States and Europe.

3. Housing, finance and economic fluctuations in the EU countries
This section offers the conclusions from the empirical analysis of fluctuations in housing investments (HI), house prices (HP) and housing loans (HL) in the background of cyclical fluctuations of twenty-seven European economies (graphs 1-27 in the Appendix). The research uses time series of housing investments represented by a volatile number of homes, whose construction has already begun, time series of house prices associated with the primary market and depicted in current prices as well as time series of the housing loans status in current prices. The reference variable is represented by
cyclical fluctuations of the GDP in particular EU member states. The descending phase of GDP cyclical fluctuations (grey area on graphs) in individual EU-27 states constituted a reference point for the analysis of the course of cyclical fluctuations on the housing and financial markets. The empirical analysis was conducted from a quarterly perspective. Despite a large variety of statistical data sources, it needs to be highlighted that a vast number of time series, especially in the housing loans area, remained incomplete. In the process of identifying the turning points of the assumed variables, these variables were exposed to logarithmical transformation, followed by isolating the odd changes and seasonal fluctuations using the X-12 Arima method, which uses various kinds of moving averages, without a clear-cut specification of the model. The band-pass Christiano-Fitzgerald filter [2003] was used in the estimation process of cyclical elements. The procedure applied assumed that time series are non-stationary variables, thus data were treated as a process of random walk with a drift. The length of isolated economic fluctuations was assumed in the analysis to be within the range of 6 to 32 quarters.

Cyclical fluctuations of the analyzed housing and financial markets variables in the EU member states are irregular in time, with volatile amplitudes and have a stochastic character. In none of the examined countries could one notice regular growths and declines in housing investments, house prices or housing loans in relation to the potential.

The ascending phases of housing cycles lasted on average 7.7 quarters, while the descending phases – 6.6 quarters. It means that the ascending phases were a quarter longer on average than the descending ones. Taking into consideration the GDP reference variable, the results are comparable (7.9 qu. and 6.8 qu.). The average minimum period of one housing cycle phase amounted to 3.8 quarters, with the maximum period being 13.1 quarters. The average standard deviation of the length of individual phases amounted to 3.4 quarters.

Based on the conducted research, it may be concluded that housing cycles in the European Union countries are discrepant and have a relatively individual course. Nonetheless, an analysis of housing cycles leads to the identification of a new, extremely characteristic phenomenon. Thus, in a part of the period under analysis, encompassing the years 2003-2007, in the majority of the European Union member states there occurred the longest or a very long ascending phase of the

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4 Time series were obtained from various sources, including the European Central Bank, national central banks, European Mortgage Federation, Eurostat, national CSOs, International Monetary Fund, World Bank, construction departments from different countries.
housing cycle. Next, in the years 2007-2009, there occurred a serious slump in housing investments in the majority of countries under analysis (except for the Czech Republic, Germany, Slovakia, Luxembourg). Until then, there had not been such violent, common reactions of housing markets in the group of countries in question. Common ascending and descending phases in the given period clearly indicate that global impulses had been transmitted to local housing markets. The phenomenon of excessive extension of the ascending phase of a housing cycle is assumed to be extremely hazardous. The costs of this extension are transmitted in the following periods to the descending phase, the course of which is quite abrupt and deeper than ‘normal’ ascending phases.

The turning points of housing investments (homes whose construction has already begun) are located before the turning points of the GDP as a reference variable. In this context, changes in housing investments exceed the changes taking place in the economy. Nonetheless, the turning points of house price fluctuations are usually located after the turning points of housing investments. It means that house prices are characterized by downward stickiness, which amplifies the tensions on the housing market. A crucial question arises at this point concerning the mechanism which keeps on the growth of house prices. The key role here is played by the financial system. Following from the research conducted, we may conclude that the ascending and descending phases as well as turning points of housing loans and house prices were close to each other, especially during the last crisis of 2008-2009. It seems justified to claim that the effect of a dynamic credit expansion in that period was the growth in house prices rather than the growth in the number of homes whose construction had already begun. Easily available and cheap money fueled the households’ expectations concerning future price growths. Housing became a crucial and profitable segment of business activity of credit institutions, especially universal banks, the cost of which was increasing the impact of imbalances in the residential real estate sector on the financial system. The decisive criterion was above all a growing collateral market value of granted mortgage loans, a derivative of a long-term growth in house prices. Other residential real estate market parameters were of much less importance in the managerial decision-making process. As a result, these decisions were based primarily on the short-run, especially on the situation at the time of selling financial services.

The extremely long ascending phase of housing cycles, which occurred in the years 2003-2007, was reflected by a very dynamic growth in dwelling prices in that period in the majority of
countries under analysis, with the exception of Austria and Germany. The shape of dwelling prices in that period in particular European Union member states is presented below – in figure 3.

**Figure 3. Dwelling prices in the European Union member states in the years 1990-2014 (2 quarters), in natural logs, seasonally adjusted**
An increase in dwelling prices occurred on housing markets even after the descending phase (measured by gross expenditures on dwellings) had begun. On the one hand, dwelling prices tended towards the downward rigidity of prices. Only after a few quarters following the emergence of the descending phase on housing markets did an abrupt decline in dwelling prices occur in many countries. On the other hand, a long-lasting increase in dwelling prices since the first decade of the
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21 century, created expectations for further growths in dwelling prices, which caused the ascending phase of housing cycles to expand. This long increase in dwelling prices had to be supported by a stream of money, which allowed for a successful distortion of cycle changes on housing markets.

Taking into consideration the results of the above studies and the conclusions from a theoretical analysis included in the first section, it seems justified to discuss the financial system as a group of factors which have the greatest influence on the course of contemporary housing cycles. In particular, a long and dynamic ascending phase of the 2003-2007 housing cycles requires further explanations together with a shorter, yet equally acute descending phase of the 2007-2009 housing cycles.

4. Conditions for the development of global financial systems

This part of the paper will present an attempt at verifying the above-presented theoretical conceptions on the basis of the EU member states. The starting point for my reflections in this area is a description of conditions for the development of financial systems around the world.

The period from the late-1990s to mid-2007 was exceptionally profitable for the global economy. The world product grew faster than the population growth, and the turnover of global trade grew even more quickly, with higher capital mobility and the domination of floating exchange rates [Gorynia, Kowalski, 2009, pp. 216-220]. The world’s economic growth was very good, which is reflected by the data concerning the US economic cycle. In the post-war era (1945-2009), there were 11 economic cycles, with an average decline stage lasting for 11 months and an average growth stage lasting for 59 months. From a historical perspective, it shall be emphasized that decline stages were shorter and growth stages longer than in previous periods prior to 1945. Moreover, from July 1990 to December 2007 growth stages were exceptionally long and lasted for 120 and 73 months respectively, with relatively short decline stages lasting for merely 8 months. Developing global trade, especially within regional integration groups such as the European Union, NAFTA, MERCOSUR, ASSEAN, ensures a growth in productivity of the factor of production [Gorynia, Kowalski, 2009, p. 216]. The development of trade connections was possible thanks to subsequent rounds of trade liberalization under GATT, the creation of the WTO in 1995 and the admission of the People’s Republic of China (PRC) into this organization [Gorynia, Kowalski, 2009, p. 216]. According to Gorynia and Kowalski [2008, 2009], the benefits resulting from globalization processes have been strengthened by the activity of the People’s Republic of China in global trade, with a reduction in
nation states’ abilities to influence effectively the direction and course of market adjustments. A regular trade surplus and an influx of direct foreign investments in China led to the accumulation of vast monetary reserves, which rose from 0.6 trillion dollars in 2004 to 3.18 trillion dollars in 2011. China has become one of the main purchasers of American Treasury securities (1.3 trillion dollars in July 2014)\(^5\) and other financial assets, thus contributing to a large extent to high excessive liquidity both on the American monetary and credit markets and globally [see also Gorynia, Kowalski, 2009, p. 220]. According to Wojtyna [2011, p. 21], large savings in PRC and other less-developed countries explain only to some degree the phenomenon of capital flow in the opposite direction, i.e. from the peripheries (less-developed countries) to the center (the United States). International capital flows should move from the countries with a lower return rate to countries with a higher return rate. Less-developed countries had a higher rate of return stemming from a relatively smaller capital stock in relation to workforce. Consequently, these countries should experience a current account deficit in the balance of payments due to a surplus of investments compared to savings [Wojtyna 2011, p. 21, Dąbrowski 2011, 74]. As Wojtyna [2011] emphasizes, international capital flows moved in the last two decades in the appropriate direction according to the theory only in mid-eastern European countries. That is why, we shall assume that this phenomenon is not fully explained in the macroeconomic theory.

The process of financial markets globalization and liberalization, especially since the 1980s, led in the first decade of the 21st century to a transfer of world’s savings to central areas, especially the largest United States, where they were redistributed. Excessive financial liquidity was accompanied by an extreme growth in the current account deficit in the balance of payments in the US between 2002 and 2006 (Fig. 4). Although as early as in the 1980s the United States became the world’s debtor, rapid changes began only from the year 2000. The US foreign debt, measured with a net international investment position, grew from -4% of GDP in 1990 to -13% in 2000 and -17% of GDP in 2010, with a maximum value of -23% in 2008 [estimated on the basis of BEA and IMF data]. Dąbrowski [2011, pp. 69-71] offers valuable remarks in this aspect, updating previous conclusions put forward by Bernanke [2005], concerning the relationship between domestic investments and savings. Since the beginning of the 1980s, the propensity to save has become weaker in the United

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\(^5\) The share of the PRC in the ownership structure of American Treasury securities’ buyers between 2000-and 2012 changed radically, from 6% in January 2001, with the assets value of 60 billion dollars, to 21% in July 2014, with the value of 1.3 trillion dollars [data from CEIC and U.S. Department of the Treasury].
States. At that time, investments in the American economy exceeded domestic savings, which strengthened capital needs. The gap between domestic investments and savings almost doubled between 1980 and 2008, rising from approximately 2.5% to 4.5% of GDP respectively [Dąbrowski 2011, p. 70]. Additionally, a growing deficit in that period paradoxically aided in funding the negative current account balance, since countries such as the PRC invested their financial surplus in American debt securities [Soros 2010, p. 134].

**Figure 4. Current account deficit in the balance of payments, budgetary deficit and public debt in % of the US GDP between 2001-and 2013**

Apart from the phenomenon of a savings growth in the People’s Republic of China, Bernanke [2005] indicates two more reasons for changes in current accounts in the United States, which will just be mentioned at this point. The first was the fear of recurring financial crises in emerging economies (financial crises in Mexico in 1994, in south-eastern Asian countries in 1997-1998, in Russia in 1999, in Argentina in 2002). In this aspect, Dąbrowski [2011], after McKinnon and Schabl [2004], emphasizes that the Asian countries in particular managed to prevent overvaluation their currency, maintaining a stable exchange rate. The second reason concerns a dynamic growth in crude oil prices between 2005 and 2009 [Dąbrowski 2011, p. 75]. Nonetheless, it has to be

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6 In a philosophical approach, Gray [2009] emphasizes that a loan has changed its function during the last decade, from an instrument which facilitated running a business to an instrument of getting rich. Using a cheap loan, financial institutions multiplied their profits, and the society – including some of its least well-off groups – began to perceive incurring high loans as a method of capital building.

7 The Japanese savings were also invested in higher-interest foreign currency instruments, since interest rates in Japan after a crisis on the real estate market dropped to very low levels [Soros 2010, p. 134].
highlighted that even such a rapid growth in the current account in the balance of payments did not cause the United States to lose its credibility as a state. Nonetheless, there occurred a crucial decrease in confidence in the financial system in the United States, which was immediately transmitted to foreign financial markets.

Growing excessive liquidity in the United States, with the crisis of the year 2000 in the internet sector and the sectors related to it and after the attacks of September 11, 2001, caused a change in the monetary policy of the US Federal Reserve System. The process of reducing the federal funds rate was initiated, resulting in a drop from 6.5% in July 2000 to 1% in June 2004 [FED data]. These tendencies were reflected by the process of reducing interest rates all around the world until April 2004, which is presented in Figure 5. [cf. Gorynia, Kowalski, 2009, p. 220]. According to Taylor [2010, pp. 24-26], the Federal Reserve System withdrew in 2002-2004 from setting interest rates in accord with those that would follow from the Taylor rule, which resulted in deviations of -2 to -3 basis points. Such action was not accidental, but stemmed from the monetary authorities’ fear of the US entering deflation similar to Japan’s from the 1990s [Taylor 2010, p. 26]. The European Central Bank (ECB), according to Taylor, copied the negative behavior of the Federal Reserve System. The ECB’s interest rate was two basis points too low in the analyzed period between 2000 and 2006 in relation to the Taylor rule [Taylor 2010, p. 35]. Thus, according to Taylor, the actions of the Federal Reserve System contributed to a housing market boom and its subsequent rapid slump, with significant intermediate repercussions for the euro-zone states. Taylor [2010, pp. 32-34] built his thesis drawing on the results of Ahrend, Cournède and Price’s research [2008]. These authors showed the statistical importance of the relationships between the index of actual, short-term interest rates deviations from the interest rates set using the Taylor rule and the index of residential investment changes in % of GDP, the index of real house price deviations, the index of construction investments, in Eurozone countries and the OECD countries between the third quarter of 2001 and the fourth quarter of 2006 [Ahrend, Cournède, Price 2008, p. 18]. Despite the statistical importance of the obtained results, the authors admit that rapid growth in house prices occurred also in the periods, in which interest rates were in line with Taylor rules. That is why, we shall examine the structure of the financial system, the influence of financial innovations and deregulations as an accelerator of house price growth.
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Figure 5. Monetary market interest rates in the United States and the EU member states between January 1990 and January 2014

Source: Based on the International Monetary Fund data.

Summing up, the key conditions for a rapid development of the global financial system was the process of globalization and liberalization of capital flows, strengthened by the activity of the People’s Republic of China, with a decreasing ability of national states to effectively influence market processes. There was a transfer of savings from low- and medium-income states to developed countries, especially to the United States. This phenomenon was accompanied by an overly expansive monetary policy led by the Federal Reserve System, which was copied by central banks around the world, and especially by the European Central Bank8 [see more Wang, Zhang, 2014; Whitehead, Priemus, 2014].

5. Institutional changes in the system of housing investment finance

The financial system constitutes a part of the financial sphere, excluding financial management of the real sphere entities, which encompasses above all the financial institutions, instruments and

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8 In subject literature, there appear views which are different from the above presented one. For example, according to Andrzej Wojtyna [2011, p. 21], due to originating in the past the processes which were not fully understandable and well thought-out in terms of their consequences, there appeared a global financial system which turned out to be unstable. George Soros [2010], on the other hand, claims that the development of the financial system is a result of institutional solutions initiated in answer to the Great Depression of the 1930s. Whenever there is a threat of financial system crisis, there is state intervention. Thus, this process brings about the phenomenon of the so-called temptation to overuse. The entities which have an awareness of the state support in crisis situations tend to take more risky actions than those which do not have the support and must face the consequences of their mistakes by themselves [Soros 2010, p. 131]. That is why, some authors think that the financial crisis of 2008-2009, due to its global scale, great importance of herd behavior and strong connections between the real and financial spheres, was similar to the Great Depression of the 1930s [Wojtyna 2011].
principles determining mutual connections and relationships with the surroundings. The main aim of this system is to provide a certain range of services to non-financial entities, which will serve the purpose of the real sphere development, including at the same time the costs of functioning of the financial system itself and its stability [Pietrzak, Polański, Woźniak, 2004]. The system of housing investment finance is one of the areas of functioning of the financial system, set apart on the basis of investment types. Simultaneously, the system of housing investment finance realizes its own economic and social goals resulting from the housing policy aims and from wider goals of the socio-economic development. These goals are accounted for both in the general organizational and legal forms of the financial system as well as in specific instruments and institutions [Andrzejewski, 1987]. It is thus assumed that the system of housing investment finance defines the forms of the process of accumulating and dividing financial resources intended for investments [Dominiak, 1976]. The aim of its functioning is to provide the non-financial entities with financial resources enabling them to realize residential investments. Depending on the scope and degree of the state intervention in the cash flow mechanism, we may distinguish between the market subsystem or the public subsystem of housing investment financing. The market subsystem of housing investment finance functions on the basis of transactions, in which at least one side is a private institution and the cash flow takes place using the market mechanism. Let us look at the condition and dynamics of the changes in the market subsystem of housing investment financing, in particular EU member states between 1990 and 2013.

To begin with, the EU countries experienced a rapid growth in the credit expansion from the last decade of the 20th century to the year 2008. The value of the households and firms debt in % of GDP increased in the EU-27 states by 53 percentage points in 2007 compared to 1995 (fig. 6). This growth amounted to 77 percentage points in the US, and only 31 percentage points in eastern Asian countries.

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9 The structure of the market financial system consists of: a) individual markets, where transactions with financial instruments are made, b) financial institutions, called financial agents, which take over or purchase financial liabilities, c) financial instruments, which are characteristic financial liabilities, claims concerning the assets of some economic entities connected with other entities, and d) principles (norms) used in the system, i.e. the rules of determining the manner of functioning of markets, institutions, instruments [Pietrzak, Polański, Woźniak, 2004, p. 23].
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Figure 6. Value of private sector loan debt in % of GDP around the world

Besides the main trend of the financial system development mentioned above, it is highlighted that in the EU member states the housing loan debt grew faster than the Gross Domestic Product in the years 1998-2013 (fig. 7). Only after the financial crisis of 2008-2009 did the value of granted housing loans drop, resulting in its stabilization in 2010-2011. The European Union member states are extremely diverse in terms of the mortgage debt value. An average housing loan debt in percentage of GDP grew in the EU-27 from 20% in 1995 to staggering 40% in 2013. The lowest indices were observed in Eastern European countries, whereas the highest indices were observed in such countries as: the Netherlands, Denmark, Ireland, the UK, Sweden, Portugal and Spain.

Figure 7. Gross Domestic Product and housing loans in the European Union between 1998 and 2013
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Figure 8. State of housing loans granted in the European Union member states in the years 1990-2012 (m. 6), data in natural logs, seasonally adjusted
With reference to the dynamics of changes in housing loans, it shall be highlighted that the occurring growths were particularly abrupt, especially in the first decade of the 21st century in almost all European Union member states. Figure 8 presents the shape of the households’ housing loans intended for housing purposes in the years 1990-2014 (2 quarters). This stream of easily available money on real estate markets translated into a longer ascending phase of housing cycles (years 2003-2007). With reference to the dynamics of housing loan changes, one should bear in mind that it was extremely abrupt in the European Union, especially in the first decade of the 21st century. Figure 9 presents the dynamics of the housing loan debt growth rates, in the ascending order, i.e.
from the smallest to the biggest change in 2010 compared to 1999. An average debt growth rate in relation to the GDP grew by as many as 17 basis points in the EU between 1999 and 2010. A record growth in housing loan debt was observed in the analyzed period in Cyprus, Ireland and the Netherlands (64, 58 and 46 basis points respectively).

**Figure 9. Housing loan debt as % of GDP between 1999-2010 (from slowest to fastest growths)**

Housing loans constituted on average 14% of total assets in monetary balances of financial institutions from the EU member states in December 2011 (12% in January 2005), with marginal values of 2% in Luxemburg and 31% in Estonia (figure 10). The above relationship between housing loans and assets has grown in the last two decades in the EU countries. This growth was particularly noticeable in central European states, especially in the Czech Republic, Latvia, Lithuania, Poland, Slovakia, but also in southern Europe (Greece and Spain) and in Sweden. These countries experienced a significant increase in the engagement of credit institutions in the housing sphere.

**Figure 10. Condition of housing loans in % of total assets of monetary financial institutions at the end of 2011**

Let us analyze here the structure of the market subsystem of housing investment financing. This structure is composed of the mechanisms which allow credit institutions to obtain financial means for granting housing loans. Among these mechanisms there are the following: 1) deposit mechanism, otherwise known as commercial banking mechanism, 2) contact mechanism, 3)
mortgage banking mechanism, 4) securitization mechanism [cf. Lea, 1999; Lis 2008, 2010, Chiquier, Lea, 2009; Główka 2010]. It is emphasized that credit institutions in contemporary financial systems more and more frequently use the mechanisms which make it possible for them to effectively obtain financial means for strengthening credit lending. Nonetheless, let us take an insight into the above presented mechanisms, especially from the perspective of financial stability of residential investments.

5.1. Deposit mechanism (commercial banking mechanism)

In the deposit mechanism (commercial banking mechanism), housing loans are refinanced with individual savings of households and businesses, put aside in credit institutions as savings deposits or time deposits. Citizens’ deposits play a vital role as a refinancing source of housing investments, especially in the economies which do not have well-developed secondary market instruments, such as: covered bonds or mortgage-backed securities (figure 11). The creditors, in this case, are mainly commercial banks, universal banks, but also cooperative banks or credit unions (cooperative savings and loans organizations), which entered the market of long-term mortgage loans as a competitive action. These institutions aim at attracting customers for a long time, which makes it possible to obtain a higher rate of return on operating activity [Jaworski, Krzyżkiewicz, Kosiński, 1999, p. 124].

Figure 11. Deposit mechanism and other sources of housing loans refinancing in the EU member states

Source: Based on IMF and ECB data.
The citizens’ deposits used in refinancing housing loans do not meet the basic financial principle connected with adjusting the liquidity of assets to the maturity of liabilities. However, the process of financial liberalization led to the development of the source of housing loans refinancing which used to be regarded as unacceptable. Thanks to liberalization, central banks in Europe (and the United States and Canada) had the possibility to provide additional financial resources to the interbank market, in order to maintain the turnover liquidity when required. Additionally, the process of introducing deposit insurance systems in the countries of the former European Economic Community was accelerated (from 1986)\footnote{Directive 94/19/EC of the European Parliament and the Council of the European Union of 30 May 1994 on deposit-guarantee schemes introduced a requirement for the existence of deposit guarantee systems in all EU member states.}. These actions encouraged credit institutions to use some of their deposit base to refinance granted housing loans. This peculiar security buffer is a justification for commercial banks (being more and more frequently universal in their character) to breach the basic principle of financing [Ahlswede, 2011].

Let us now look at some fundamental advantages and drawbacks of the deposit mechanism [see more in Lis, 2008, 2012]. Deposits constitute a relatively stable and inexpensive source of housing loans refinancing, assuming that the banking sector infrastructure is already well-developed\footnote{An average cost of deposits in Polish banks was shaped below the WIBID rate (Warsaw Interbank Bid Rate), i.e. the rate at which banks are willing to pay for depositing means for their use [Główka, 2010, p. 109].}. When the effect of returns to scale has been achieved, housing loans refinancing with the instruments based on the capital market, may be cheaper than refinancing with deposits\footnote{According to M. Lea’s studies, the cost of acquiring funds from the capital market in the United States is lower than the cost of acquiring deposits. In the last decade, the UK has also dynamically developed its capital market, which resulted in a change in the relationship between the deposit cost and the cost of assets from the capital market. These results must be completed with an assessment of housing finance systems conducted in 2003 by Mercer Oliver Wyman, a company which points at two more countries - Denmark and Germany, in which capital market funds are cheaper than the costs of acquiring deposits [Lea, 2000; Wyman, Low, Sebag-Montefiore, Dübel, 2003].}. Considering the diversification of the entire credit portfolio as a method of the total credit risk management, the banks’ involvement in the market subsystem of financing will increase the diversity of assets. Some bank assets are not connected with the residential real estate market. A long-term housing loan makes it possible for banks to offer their debtors new financial services. Vertical integration within commercial banking allows creditors to avoid transfer costs of individual financial functions. The issuer, owner and servicer of granted mortgage loans is a commercial bank. Nonetheless, one consequence of supplying housing loans refinanced with deposits is a floating
rate. The interest rate risk is fully transferred to the bank’s client, similarly to the foreign exchange risk in the case of housing loans denominated in foreign currencies.

Cyclical fluctuations of deposits as a source of credit refinancing, including housing loans, are reflected by cyclical fluctuations of the GDP as a reference variable lagged several quarters. To illustrate the above relation, figure 12 presents cyclical fluctuations of deposits and loans in Poland in relation to the GDP as a reference variable. In this case, the deposit lagged six quarters compared to the reference variable. As a consequence of this economic slowdown, there usually occurs a decrease in the number of deposits in the following periods, whereas when there is an economic revival, the number of deposits may increase. Nonetheless, deposit volatility is incomparably smaller than loan volatility.

Figure 12. Cyclical fluctuations of deposits and loans in Poland between 1996 Q2 and 2012 Q1

![Graph showing cyclical fluctuations of deposits and loans in Poland](image)

Explanations: time series in logarithms, filtered with the Census X12 method, cycle isolated using Christiano – Fitzgerald filter. Grey areas mean economic slowdown areas under the definition of the contemporary economic cycle. GDP as a reference variable.

Source: self-analysis on the basis of the National Bank of Poland and CEIC data.

Credit institutions, based to a large degree on the deposit mechanism, tend to engage impulsively in financing of the residential real estate sector, i.e. the engagement is high during the time of relatively stable house price growths and low when the price trend is reversed. The first case may lead to the occurrence of a funding gap\(^1\). Filling this gap is possible with the use of financial means from foreign institutions, especially with strong ownership connections between credit institutions running in various countries. Furthermore, the interbank market activity increases, especially in the deposit transaction segment (insured and uninsured deposits). Short-term

\(^1\) Funding gap – a relationship between the remainder of loans and deposits to loans. Loans and deposits include operations with entities from the non-financial, government and self-government sectors.
uninsured debt instruments and interbank loans or wholesale deposits are extremely sensitive to external factor changes [cf. Ahlswede, 2011, p. 2]

The deposit mechanism functions in various institutional forms in Bulgaria, Cyprus, Estonia, Luxemburg, Latvia, Lithuania, Malta, Poland, Romania and Slovenia. In these countries housing loan refinancing takes place neither through covered bonds nor through mortgage-backed securities. Obviously, other instruments allowing for obtaining financial means may be used, yet they do not fulfill the fundamental criterion of long-term liabilities. Taking Poland as an example, it has to be highlighted that the deposit mechanism does not ensure stability of housing investment finance regardless of the economic condition. A negative shock connected with the financial crisis in the Unites States was reflected by a decrease in the number of housing loans granted in Poland.

A dynamic growth in the number of loans granted by Polish banks, with the banks’ deposit base growing at a slower pace, contributed to the widening of the financial gap, which stood out in full relief especially in the period of financial turmoil, i.e. from the 4th quarter of 2008 to the 1st quarter of 2009. Under stable conditions, Polish banks fill up this gap by means of financial resource loans on both domestic and foreign interbank markets, by obtaining deposits from non-bank financial institutions and by issuing securities. The bankruptcy of the American bank Lehman Brothers on 15 September 2008, caused a significant growth in the contracting party’s risk on world markets and resulted in reductions in interbank transaction limits as well as a decrease in financial markets liquidity. A consequence of the international market turmoil was a reduction in mutual transaction limits among banks in Poland. Banks reacted in various ways to this situation, depending on the model (strategy) of refinancing granted loans. There are three such models: deposit, foreign funding and mixed models. In the deposit model banks rely their development on acquiring the deposits from the non-financial, government and local-government sector. In the foreign funding model the source of means were the foreign owners of Polish banks. In the mixed model it is difficult to indicate a predominant refinancing source. Finally, it must be mentioned that the participation of banks with particular financing strategies in the commercial banks assets amounted about 60% in the deposit model, above 20% in the mixed model and 15% in the foreign funding model.

Banks which realized the deposit strategy and the mixed strategy to some extent began a competitive fight for citizens’ deposits in the 4th quarter of 2008, in the face of limited availability of resources on the interbank market and problems with filling up the financing gap. As a result, the deposit interest rate increased, leading to a considerable increase in the source of refinancing
housing loans during financial turmoil. Banks in the mixed model, on the other hand, received only the indispensable financial supply from their western owners, inhibiting at the same time credit lending. This aid from foreign owners of Polish banks contributed to some extent to maintaining stability of the domestic financial system, yet it did not contribute in any degree to a balanced development of housing financing. Moreover, this mechanism inhibited the financing of housing investments conducted by developers. It appears that the main issue was the uncertainty concerning the participation of non-performing loans in the credit portfolio of financial institutions and higher refinancing costs of future housing loans. It must also be highlighted that universal banks in Poland realized to some extent the strategy of their foreign owners, who many a time had liquidity problems themselves resulting from the turmoil on global financial markets. In such a case, the foreign owners decided about the scale of financial system supply for their banks in Poland.

To sum up, the deposit mechanism perfectly fits the developed infrastructure of the banking sector, with deposits being a relatively cheap source of housing loans refinancing. Problems begin with dynamic credit expansion and a rapid increase in the participation of housing loans in credit institutions’ assets. Such a situation causes a growth in liquidity risk, which imposes higher activity on banks in acquiring capital, which in turn will be short-term in character and much more sensitive to economic turmoil compared to deposits. The deposit mechanism transmits external impulses, which has been shown on the example of Poland. It stems in this case from the connections between the credit institutions running in Poland and their foreign investors. The costs of regulating the liabilities to these entities constitute to some degree the running costs of this mechanism. An additional, obvious cost is transmitting negative shocks from the global economy to the domestic system of housing financing. However, this mechanism offers in return, housing loans with a floating rate only, transferring the risk it entails to the debtor. Furthermore, in order to lower financing costs, banks offered loans denominated in foreign currency, thus also transferring the currency risk to the debtor. Only after a very expensive government program and the Financial Supervision Authority’s actions are implemented does this unfavorable structure of granted loans change.

5.2. Contract mechanism
The experience of many countries shows that housing needs may effectively motivate households to regular and long-term saving [Główka, 2010; Furga, 2008, 2011; Szelągowska, 2011; Lis, 2009, 2011]. The source of financing housing loans granted within the contract mechanism is the savings
contribution made by natural persons to credit institutions. The primary element of the contract mechanism is the contract (agreement) between a credit institution and a client, concerning above all the so-called target sum, saving conditions and loan granting conditions. The target sum consists of the client's savings contributions, interest on these contributions paid by the bank, housing bonus and housing loan. The client is obliged to regular saving for the period set in the contract (usually from 5 to 7 years), but the interest on their contributions in this mechanism is constant and much lower than the interest on commercial deposits. After the contractual saving period, the client is entitled to apply for a housing loan, the value of which is the multiple of accumulated savings, capitalized interest and savings bonuses granted by the state (as a form of financial subsidies). According to Furga [2008, p. 42], the sum received by the client to realize housing investments consists of a relatively large share of own resources, amounting on average to 40%. There are two forms of the contract mechanism: closed and open.

The closed form of the contract mechanism concerns specialist credit institutions, i.e. building and loan associations, where the access to housing loans is determined by the principle of waiting. This principle enables managing the liquidity of a credit institution (extending or shortening the loan waiting period), since housing loans are granted based solely on previously accumulated deposits. Thus, housing loans are suitable only for those clients who managed to accumulate savings in this mechanism. The closed form includes a variable number of participants in the contract, various contractual target sums, different levels and periods of savings, different interest on contributions and loans, severing contracts by some savers and resigning from loans by some clients. Nonetheless, the associations administer their clients' savings and cannot pay out more resources than they receive from the savers and debtors [Furga, 2008, p. 42]. An example of this form is a specialist financial institution such as Bausparkassen in Germany and Austria. However, this mechanism functions in other EU countries as well, e.g. the Czech Republic, Romania, Slovakia, Hungary, Belgium and Luxemburg.

The open form of the contract mechanism, on the other hand, is based on building societies which run as separate entities under universal banks. Clients may incur liabilities regardless of the societies' financial liquidity. Deposits may be used by universal banks to grant other loans or to invest in securities. An example of the open form of the contract mechanism is a financial institution such as Epargne Logement in France.
Let us now take a general look at some basic advantages and disadvantages of the contract mechanism [more in Lis, 2008]. Among the benefits of this mechanism, we may enlist: stability of housing investment finance during crisis periods, fixed housing loans interest rate (no interest rate risk), housing loans in domestic currency (no currency risk), promotion of regular saving in the economy, quite high clarity of the functioning of societies, supporting the sensitive groups in the housing policy. Among the drawbacks, on the other hand, there are: necessity to keep a moderate, stable inflation rate (over 15%), a relatively small value of housing loans granted, financial subsidies connected with savings bonuses may be a considerable burden for the national budget, especially high in the period of the implementation of this mechanism.

The contract mechanism guarantees lending stability, even in the period of economic slowdown. To illustrate this conclusion, figure 13 presents cyclical fluctuations of housing loans granted by monetary financial institutions, including commercial banks, mortgage banks, cooperative banks, savings banks and building and saving associations in Germany. Research clearly indicates that the growth phases of housing loans granted by building and saving associations occurred in the decrease phase of the GDP as a reference variable.

**Figure 13. Cyclical fluctuations of housing loans granted by building and saving associations and other credit institutions in Germany between 1991Q1– 2012 Q2 in the background of economic fluctuations**

Explanations: time series in logarithms, filtered with the Census X12 method, cycle isolated using Christiano – Fitzgerald filter. Grey areas mean economic slowdown areas under the definition of the contemporary economic cycle. GDP as a reference variable.

Source: self-analysis on the basis of the CEIC data.

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14 For example, a typical finance structure of house purchase in Germany (house worth 100,000 euro) is divided like this: 1) 18% of value – savings accumulated in the building and saving association, 2) 10% of value – additional own capital, 3) 22% of value – housing loan obtained from a building and saving association, 4) 50% of value – housing loan obtained outside the contract mechanism.
Summing up, the contract mechanism is largely independent from economic cyclical fluctuations. Consequently, housing loans granted within this mechanism are relatively stable in terms of their value and volume. Obviously, there is no possibility of a significant increase in the value of credit lending during the economic crisis or decrease in credit lending during economic revival. The clients of building and saving associations must undergo a relatively long saving stage. Additionally, the functioning of building and saving associations is endangered by a high inflation rate.

5.3. Mortgage banking mechanism

The basis for the functioning of the mortgage banking mechanism is covered bonds, which make it possible to refinance granted housing loans. Covered bonds are registered securities or bearer securities, the issuing of which is determined by credit institution liabilities backed with mortgages and/or guaranties given by the governments of individual states, central banks, international organizations and local-government entities.

Let us take a closer look at a few characteristic features of covered bonds. First of all, the buyers of covered bonds have a full right of recourse regarding the issuer, this right being absolute, unlimited and priority. The basis for our reflections is the fact that covered bonds remain on the issuer’s consolidated balance sheet. The issuer (a credit institution) of covered bonds commits itself to fulfill financial services to its buyers consisting in paying out the interest and buying back the securities in the period and manner defined by the terms of issuing. The issuer runs and keeps a register of covered bonds collateral, which includes separate records for mortgage bank liabilities constituting the basis for covered bonds issuance. When a credit institution refinesances granted loans from various sources, it is the covered bonds buyers who have the right of priority regarding their claims, before any other buyers of un-backed securities. In case of the bankruptcy of a bank or a credit institution, the assets enforced from the liabilities recorded in the register of covered bonds collateral may be used only to fulfill the claims of covered bonds buyers. Secondly, covered bonds issuers are controlled and supervised by both a general institution of financial system supervision running in every country and a specialist supervision institution, most frequently referred to as a trustee. The trustee must be a natural person, independent (cannot work for the issuer), who possesses certain qualifications and gives a warranty of reliable fulfillment of the duties imposed on them. The duties of this specialist supervisor include checking if the liabilities resulting from the sales
of covered bonds are legally secured by a mortgage bank. Furthermore, the trustee monitors the value of real estate which constitutes collateral to mortgage loans granted, the value of covered bonds issuance in relation to the bank’s mortgage-backed liabilities, the manner of covered bonds collateral record keeping conducted by the bank, cover pool for future covered bonds issuance.

Covered bonds, present in particular EU member states (Denmark, Spain, Sweden, France, Germany), frequently possess unique features apart from the general specification described above. The last financial crisis highlighted the weak points of diversified legal solutions concerning covered bonds in the EU countries. Not until January 2008 did the European Mortgage Federation formulate, regardless of the European Union directives, the essential features which covered bonds should have. It stemmed from the necessity of distinguishing between covered bonds and asset-backed securities and a senior unsecured debt, i.e. the instruments which were directly connected with the financial crisis. Capital market investors completely lost their trust to this kind of securities, which are the basis for the securitization mechanism. Thus, there was a real risk of unfavorable trends spreading across the entire financial secondary market, including the covered bonds turnover. With this in mind, the activities of the European Mortgage Federation shall be regarded as late, bearing in mind the negotiation problems in terms of achieving a shared stance, which appear in this situation. Furthermore, enabling special purpose vehicles to turn over covered bonds seems an unfavorable action, since it moves the mortgage banking mechanism closer to the less-secure securitization mechanism. The similarities and differences between the sources of refinancing existing in the two mechanisms are depicted in table 2.

Table 2. Main features of covered bonds and mortgage-backed securities

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Covered bonds</th>
<th>Mortgage-backed securities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Issuer motivation</td>
<td>Mortgage loan refinancing</td>
<td>Lower credit risk, mortgage loan refinancing</td>
</tr>
<tr>
<td>Mortgage loan creation.</td>
<td>Bound process</td>
<td>Separate process</td>
</tr>
<tr>
<td>Influence on balance.</td>
<td>Assets remain on the creditor’s balance sheet</td>
<td>Assets are set apart from the creditor’s balance sheet</td>
</tr>
<tr>
<td>Repayment source of capital instalments and interest.</td>
<td>Issuer’s cash flow</td>
<td>Secured cash flow</td>
</tr>
<tr>
<td>Risk exposure:</td>
<td>Issuer</td>
<td>Investors</td>
</tr>
<tr>
<td>- credit risk</td>
<td></td>
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</tbody>
</table>

Covered bonds are one of the refinancing sources of capital market-based housing loans. The sources of refinancing constitute a valid criterion for mechanism differentiation in the market financing subsystem. Based on this, covered bonds belong to the mortgage banking mechanism. However, this mechanism is not uniform. Thus, it seems that a better criterion for distinguishing between various types of the mechanism is a classification according to the kind of bank or credit institution issuing covered bonds. In this context, we may differentiate between the following:

1. specialist model (classical),
2. totally specialist model,
3. universal model:
   a. licensed universal model,
   b. non-licensed universal model.

In the specialist model, which originated the mortgage banking mechanism, separate banks or credit institutions are established to perform the activities imposed on them from the top. These entities are called mortgage banks, and their primary tasks are lending mortgage-secured loans and issuing cover bonds. Besides, mortgage banks are entitled to purchase other banks' liabilities from the mortgage-secured loans and non-mortgage-secured loans granted by these banks. The mortgage banks' issuing activity concerns mainly the issuance of mortgage bonds, the basis of which are the mortgage bank's liabilities from granted mortgage-secured loans and purchased liabilities of other banks from mortgage-secured loans granted by them. Furthermore, in some contexts it is possible to issue public covered bonds, the basis of which are the mortgage bank's liabilities from granted non-mortgage-secured loans and purchased liabilities of other banks from non-mortgage-secured loans granted by them. This additional segment of mortgage banks' activity has been permitted in Luxemburg, Poland and Romania. The specialist model is still present in Luxemburg, Poland, Hungary and to some degree in Finland and Romania.
The totally specialist model introduces an additional institution – a special purpose vehicle, which has an exclusive right to issue covered bonds. Securities remain only on the balance sheet of a special purpose vehicle (SPV). The SPV’s regulation is extremely restrictive in order to maintain high quality of issued securities and strengthen security against a possible bankruptcy. However, the SPV is entitled to purchase only qualified assets provided for by the law. The totally specialist model is frequently identified with the French variety of mortgage banking. Special purpose vehicles, referred to as ‘société de crédit foncier’, have an exclusive right to issue the French covered bonds, called ‘obligations foncières’. The asset pool of an SPV contains only qualified assets, including: mortgage loans secured with a mortgage recorded in the first place in the Registry of Deeds, loans connected with real estate finance guaranteed by credit institutions or insurance companies which are not associated with the SPV, as well as other loans guaranteed by the government, local authorities, central bank and EU institutions. In addition, the assets may include highly rated units of securitization funds, which consist exclusively of AAA-rated mortgage loans or loans to public institutions [Gleyze, 2011]. Under French solutions within the totally specialist model, we shall not omit the institution called “Caisse de Refinancement de l’Habitat”, CRH in short. The main aim of this institution is to finance French banks so that they are able to grant housing loans to individual entities. CRH issues high-quality bonds and lends the funds it obtains to banks, keeping the same price and maturity period. CRH’s loans are debentures issued by the lending bank and retained by CRH. Only housing loans for individual entities secured with a mortgage or loans guaranteed by financial and insurance institutions constitute qualified assets (maximum 35% of the portfolio) [Raymond 2011].

The last variety of mortgage banking is the universal model. The main feature of this variety is the extended possibility of issuing covered bonds, which includes not only mortgage banks but also other institutions. In some cases there even is a possibility to create a special purpose vehicle by financial institutions, only for the purpose of covered bonds issuance. Such a solution is acceptable is Greece, the Netherlands, the UK and Italy.

The universal model functions in two forms. The first one is the licensed universal model. The issuer of covered bonds in this case may be a government-licensed universal bank. The credit institution must meet certain legal requirements concerning the equity capital, solvency ratios, possible bankruptcy procedure. The bank’s assets, on the basis of which the issuance of covered bonds is conducted, must meet certain criteria, similarly to their issuer. The licensed universal model
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is present in Austria, the Czech Republic, Denmark, Germany, Slovakia, Slovenia, Sweden, Spain and partly in Finland. Additionally, the United Kingdom created at the beginning of March 2008 a peculiar combination of the licensed universal model and a totally specialist model using an SPV. Despite the fact that the assets are transferred to the SPV, they still remain on the issuer’s balance sheet.

The second version of the universal model, referred to as a non-licensed universal model, allows for covered bonds issuance by all bank institutions without the necessity of obtaining a license or without additional requirements to obtain it. Thus, since the issuer has a bank status, it performs unlimited activity in this area, including covered bonds issuance based on an assets pool, which do not have to meet the eligibility criterion. The non-licensed universal model is common in Bulgaria, Greece, the Netherlands, Latvia, Portugal, Italy and Romania.

Let us now take a general look at some advantages and disadvantages of the mortgage banking mechanism [see more in Lis, 2008]. The benefits of the mechanism include: applying more than in other mechanisms a financial principle connected with adjusting asset liquidity to the maturity of liabilities, a predominant fixed interest rate on housing loans (exclusion of the interest rate risk), a relatively low cost of refinancing of credit lending with an appropriate scale of activity (by rule a lower cost than in the case of the securitization mechanism), protection of covered bonds for the financial system and for capital market investors, relatively small cyclical fluctuations of granted housing loans in the case of a large scale of activity of this kind of mechanism in a given country. As regards the drawbacks of this mechanism, there are such aspects as: additional costs connected with prepayment of loans, higher own contribution compared to the deposit mechanism, costs of credit institutions connected with fulfilling the requirement of high security of covered bonds, leaving the credit risk to a credit institution, requirement of capital market functioning,

16 In terms of mortgage banking mechanism safety, it has to be stressed that there is supervision over credit institutions and over covered bonds as capital market instruments. Within institution supervision, we must refer to the limitations in the activity of credit institutions on monetary and derivatives markets, the necessity of using a quality assessment of the debtor and the real estate quality constituting the collateral for a housing loan. As regards covered bonds supervision, we may point at three priority rules: the overprotection rule (the preferred relation of loan to real estate value is 60%), the balance rule (maintaining convergence in maturity and interest of assets and liabilities) and the specialist mortgage banking rule (limiting operating activity of covered bonds issuers in order to minimize the risk of insolvency). The state can increase the protection of covered bonds buyers, in case of the issuer’s bankruptcy, by: setting the priority on mortgage as collateral of mortgage bank’s liabilities, recording covered bonds in the register of collateral before other liabilities, using the resources obtained from executing the liabilities recorded in the register of covered bonds collateral only to satisfy the claims resulting from covered bonds, ordering the assets pool continuation after the issuer’s bankruptcy, until all claims connected with covered bonds have been paid off.
concentration of the residential real estate sector risk in specialist institutions of the mortgage banking mechanism, the effect of pushing out the treasury bonds by covered bonds, information asymmetry between a local credit institution funding housing loans on the local real estate market and the investors purchasing covered bonds, who run both on the domestic market and international markets.

In the EU member states there has begun a process of spreading the availability of various instruments helping in refinancing granted housing loans to credit institutions. The more developed the specialist instruments of the secondary market (covered bonds and mortgage-backed securities) are, the larger the share of housing loans in % of GDP is (figure 13).

Covered bonds in the EU member states play a more and more important role as an instrument on the capital market (fig. 14). The structure of covered bonds issuers is dominated by such states as: Spain (21% in the structure of all mortgage bonds), Denmark (20%), Germany (14%), the UK (13%), Sweden (12%) and France (10%).

**Figure 14. Refinancing sources of housing loans based on the capital market in UE-27**

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Explanation: the condition of covered bonds at the end of 2010, the condition of housing asset-backed securities at the end of 2011, the condition of housing loans in % of GDP at the end of 2011

Source: Based on ECB and IMF data.

Cyclical fluctuations in the economy affect the mortgage banking mechanism more than in the case of the contract mechanism. It is illustrated and presented in the previous point by the

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cyclical fluctuations of housing loans granted in Germany by such institutions as mortgage banks, building and loan associations. In the case of the mortgage banking mechanism, after taking the lags into account, there occurred a significant decrease in credit lending during economic slowdowns, which did not take place in the case of the contract mechanism [see more: Kofner, 2014]. The mortgage banking mechanism is not entirely immune to cyclical fluctuations in the economy. When it came to the financial crisis of 2008-2009, two phenomena occurred, i.e. disruption of the instrument’s issuance and a growth in finance costs. Nonetheless, covered bonds regain the investors’ trust faster than housing asset-backed securities on capital markets. For example, the market value of all issued covered bonds in Denmark reacted to an economic slowdown and then came back to the ascending trend (fig. 15). After a financial crisis, investors come back on the capital market, looking for safe investments, which obviously include covered bonds. Making it impossible for credit institutions in the mortgage banking mechanism to transfer the credit risk to other entities is, in this case, a factor which strengthens the stability of covered bonds as an refinancing instrument of housing loans (see more Boelhouwer, Priemus, 2014).

Figure 15. Covered bonds and GDP in Denmark (stages and cyclical fluctuations)

Explanations: time series in logarithms, filtered with the Census X12 method, cycle isolated using Christiano – Fitzgerald filter. Grey areas mean economic slowdown areas under the definition of the contemporary economic cycle. GDP as a reference variable.

Source: Based on CEIC data.

To sum up, covered bonds are one of the safest securities on the capital market, available for both domestic and foreign investors. It stems from strict regulations of the mortgage banking mechanism, including especially the unavailability of the credit risk transfer from the covered bonds issuer to third entities. The unification of the legal framework in this aspect would cause even greater immunity of this instrument to crisis phenomena. Furthermore, we shall highlight the
process of pushing out specialist credit institutions by universal banking. The effects of this process have not been fully recognized yet, however, there is a threat of the mortgage banking mechanism shifting too close to the securitization mechanism.

5.4. Securitization mechanism

In the securitization mechanism, the main sources of refinancing granted housing loans are the so-called residential mortgage backed-securities (RMBS). The originator of securitization sells to a special purpose vehicle housing loans granted by it. The costs of purchase of mortgage loans by an SPV are covered with the issuance of RMBS. Securities document buyers claims to future payments streams. The buyer has the right of recourse against the borrower – the originator’s debtor. Future investors’ claims are collateralized with payment streams of capital installments with mortgage loan interest and the issuance payment insurance.

The essence of the securitization mechanism is its off-balance sheet character. It means actual sales of assets by a securitization investor, who thus excludes these assets from its balance sheet. Off-balance securitization transactions must be characterized at least by two features. Firstly, an SPV cannot be entitled to a return claim to the securitization originator. It entails the necessity of separating the credit risk of the securitization originator from the investment risk associated with the issuance of RMBS (and the risk associated with the assets securing them). Secondly, the SPV must be a sovereign entity independent of the originator. It protects the vehicle from possible consequences resulting from the securitization originator’s bankruptcy. Failure to meet the above requirements leads to recognizing securitization as a balance operation.

Let us just briefly enlist the benefits and drawbacks of the securitization mechanism [more in Lis, 2008]. The advantages include among all: better access to a long-term source of housing loan refinancing, better management of the finance liquidity risk in credit institutions, connected with a risk transfer to third entities, greater concentration of credit institutions on selling financial services than on acquiring new sources of credit lending finance, a possibility to optimize the distribution network of financial services. The disadvantages, on the other hand, include: a relatively expensive source of housing loans refinancing compared to covered bonds, high capital barriers for entering

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17 In on-balance sheet securitizations, the secondary market resources are obtained by issuing mortgage bonds, which remain in the credit institution’s balance sheet. Incurring a loan from other financial entities will actually meet the requirements of the on-balance sheet securitization.
the mechanism, complexity of the instrument and a lack of standardization, transferring the issuer’s credit risk to investors who purchase mortgage-backed securities.

The securitization mechanism financed an average of 21% of housing loans granted in the EU countries. Mortgage-backed securities became an essential source of refinancing of those loans, especially in Belgium, the Netherlands, Ireland, the UK, Portugal, Italy and Spain. The securitization mechanism develops more and more dynamically in the countries where the tradition associated with the mortgage banking mechanism, especially in its socialistic form, does not exist.

In relation to the stability of the securitization mechanism in terms of housing investment finance, we shall highlight its high vulnerability to cyclical fluctuations in the economy. The repercussions of the last financial crisis affected mainly mortgage-backed securities both by disturbing their issuance and increasing their finance costs. The issuance of the European housing asset-backed securities plummeted in the first quarter of 2009 to 123 billion euros, from a historical level of issuance amounting to 367 billion euros at the end of 2008. Simultaneously, the cost of obtaining financial resources from mortgage-backed securities increased for credit institutions. Despite the fact that the European version of the securitization mechanism does not possess any structural faults, common for the American version, there was a considerable decrease in investors’ trust to this kind of securities [Lis, 2010].

Summing up, the securitization mechanism in the European version should not have contributed to crisis phenomena in the financial system. In practice, however, this mechanism constituted the reason for the dissemination of the financial crisis. According to the author, American conception of housing assets securitization results in transferring of the negative phenomena of this mechanism on the European model. The introduction of semi-public and public institutions in this solution causes additional turmoil in the functioning of this mechanism on the creditors’ side – the issuer of mortgage-backed securities, and the side of domestic and foreign capital market investors.

6. Conclusions
The first decade of the 21st century faced the occurrence of extension in the ascending phase and an abrupt descending phase of housing cycles in the majority of the European Union member states. The changes in the global financial system, which occurred from the 1980s to the financial crisis of 2007-2009, shall be regarded as the main determinant of this phenomenon. The functioning of the
local housing markets became more and more dependent on the global financial system. Despite the fact that housing real estate did not actually participate in the international exchange, they became involved in global events through the financial system. It was the easy access to relatively cheap money which extended the ascending phase, and consequently led to a deep and abrupt descending phase. In the author’s opinion, the factors which cause excessive extension of ascending phases on housing markets shall be reduced. In the case of the 2009-2010 slump, the cause was the loan expansion. The costs of the extended ascending phase were born during the descending phase of housing cycles.

Among the selected housing investment finance mechanisms, the one that is most independent from economic fluctuations is the contract mechanism and the most sensitive is the securitization mechanism. Nonetheless, it should be stressed that disruptions in terms of the availability and costs of mortgage-backed securities, constituted a side effect of the functioning of a faulty securitization mechanism in the United States. On the other hand, the deposit mechanism is not able, without additional support, to provide a long-term dynamic development of the financial system. Moreover, providing additional support to the mechanism, most frequently through foreign means, causes a transmission of possible disruptions from international markets. Similar consequences result from the foreign ownership structure of domestic credit institutions. As regards covered bonds, it must be highlighted that they are a relatively stable, inexpensive and long-term source of mortgage loan refinancing. In the era of the American financial crisis, there are some limitations in the covered bonds growth, yet they are not as drastic as in the case of asset-backed securities in the securitization mechanism. That is why, it is assumed that the course of action of the European Mortgage Federation is inexplicable, since it allows for a special purpose vehicle in the mortgage banking mechanism. It is emphasized in most sources that there should be a distinct borderline these two mechanisms. However, we may notice a clear tendency to push out specialist institutions by universal institutions.

Long-term and dynamically growing house prices constituted the main source of mortgage loans expansion, which in turn caused a further growth in house prices. Research clearly shows that there were no references whatsoever to cyclical fluctuations of housing investments in the decisions taken within the financial sector. The growing value of housing loan collateral, a derivative of house price growth, became the decisive criterion here.
APPENDIX 1

HOUSING, FINANCIAL AND ECONOMIC CYCLES
IN THE EUROPEAN UNION MEMBER STATES (UE-27)
Graph 9. Housing cycles in France

Graph 10. Housing cycles in Germany

Graph 11. Housing cycles in Greece

Graph 12. Housing cycles in Hungary

Graph 13. Housing cycles in Ireland

Graph 14. Housing cycles in Italy

Graph 15. Housing cycles in Latvia

Graph 16. Housing cycles in Lithuania
Graph 17. Housing cycles in Luxemburg

Graph 18. Housing cycles in Malta

Graph 19. Housing cycles in the Netherlands

Graph 20. Housing cycles in Poland

Graph 21. Housing cycles in Portugal

Graph 22. Housing cycles in Romania

Graph 23. Housing cycles in Slovakia

Graph 24. Housing cycles in Slovenia
This project has received funding from the European Union’s Seventh Framework Programme for research, technological development and demonstration under grant agreement no 266800

Graph 25. Housing cycles in Spain

Graph 26. Housing cycles in Sweden

Graph 27. Housing cycles in England
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THE ABSTRACT OF THE PROJECT IS:

The research programme will integrate diverse levels, methods and disciplinary traditions with the aim of developing a comprehensive policy agenda for changing the role of the financial system to help achieve a future which is sustainable in environmental, social and economic terms. The programme involves an integrated and balanced consortium involving partners from 14 countries that has unsurpassed experience of deploying diverse perspectives both within economics and across disciplines inclusive of economics. The programme is distinctively pluralistic, and aims to forge alliances across the social sciences, so as to understand how finance can better serve economic, social and environmental needs. The central issues addressed are the ways in which the growth and performance of economies in the last 30 years have been dependent on the characteristics of the processes of financialisation; how has financialisation impacted on the achievement of specific economic, social, and environmental objectives?; the nature of the relationship between financialisation and the sustainability of the financial system, economic development and the environment?; the lessons to be drawn from the crisis about the nature and impacts of financialisation?; what are the requisites of a financial system able to support a process of sustainable development, broadly conceived?

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