Real estate prices and CNB monetary policy

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I. Introduction

Real estate prices are among the fundamental indicators for the development of asset prices. The growing importance of asset prices for central banks' monetary policy is the consequence of the ongoing liberalisation of the economic environment and the ensuing globalisation of the world economy. The central banks of advanced countries continue to focus primarily on their main objective, price stability. Nevertheless, the changing global economic environment has been responsible for a certain shift in the perception of a central bank's fundamental role towards that of securing financial stability.

The changing global economic environment has also affected the impact on the central banks' monetary policy in the developing European countries, including the Czech Republic. The high degree of liberalisation of the financial markets not only means that the effects of global economic changes are swiftly passed on to the national economy, but is also responsible for a wide variety of financial innovations. These innovations result in an ever-expanding range of assets, the gradual erosion of differences between the financial and non-financial sector and the rising importance of asset prices in monetary policy in the transforming countries.

In the case of the Czech Republic, the question of asset prices in the Czech National Bank's monetary policy has been examined chiefly in the last two years. This is based on the desire to preserve macroeconomic and financial stability, particularly following experiences with the instability of the banking system in the second half of the 1990s. With regard to the Czech Republic's entry into the European Union in 2004, attention is currently paid to the sharp rise in real estate prices. This is the background to this study on the subject of real estate prices and CNB monetary policy. The next two sections focus on the general definition of assets and the significance of asset prices for the central bank's monetary policy. The three subsequent sections look at the situation in the Czech Republic, primarily with regard to the definition of assets, monitoring real estate prices and the importance of real estate prices in the CNB's monetary policy. The resulting analysis chiefly reflects the authors' practical experience of monetary policy and monetary analyses during the economic transformation of the Czech Republic.

II. General definition of assets

Using a theoretical definition, an asset may be defined as an item with a market, ie, exchangeable value, which forms part of the wealth or property of its owner. A distinction is made between financial and non-financial, or real, assets.

Financial assets are assets in the form of cash, bank deposits and securities which bring their owners a return in the form of interest on the deposits and bonds or dividends from shares. Financial assets also include a foreign exchange rate as the price of a specific asset - currency. *Non-financial assets* include production factors (land, buildings, machines, vehicles, mineral deposits) and immaterial assets (eg patents or trademarks). When examining asset prices, central banks typically focus primarily on financial assets and non-financial assets in the form of real estate and land.

Financial and non-financial assets are present in all areas of a society's economic activity. They constitute a common ingredient of the portfolios of practically all economic sectors. A fundamental factor that determines the prices of specific assets is supply and demand. The classic market axiom applies: when demand is greater than supply an asset's price rises and vice versa. This is closely linked to the degree of a given market's development, ie, whether the market is advanced and effective and has sufficient liquidity.

The economic cycle also influences asset price developments. Different assets develop differently within the economic cycle. The largest difference can be seen in the development of share and bond

prices. During a recession, share prices fall as a result of falling profits. Bond prices, however, rise in response to the fall in interest rates. During a depression, shares continue to have a low, and bonds a high, market value. During the recovery phase, share prices rise together with rising profits, while bond prices begin to fall. In times of boom, share prices are high due to high profits and bond prices continue to fall. From the long-term standpoint, share prices essentially copy the development of economic activity; in fact, from a shorter perspective they generally anticipate the development of the real economy by several months.

Expectations also influence prices. According to the theory of expectation, long-term rates represent the mean of future anticipated short-term rates, including risk premium. This means that share prices can be interpreted as prices reflecting the current value of anticipated future company revenues and real estate prices on the basis of expected future rents. Changes in short-term interest rates thus affect long-term rates and asset prices in relation to how monetary policy will affect expected future short-term rates, returns and rents. Expectations also form part of the effective market hypothesis[1] (the school of rational expectations as part of new classical theory), according to which all accessible data on asset prices that are relevant for the formation of expectations are immediately reflected in market prices. In addition to existing experience, this data also includes various prognoses of economic development and the opinions of central bankers regarding the development of basic macroeconomic indicators.

No less important a factor in price forming is speculation, the result of which is the creation of so-called price bubbles. Bubbles can indicate the future fall in asset prices and thereby reduce real economic activity. According to monetary theory,[2] a bubble may arise, but will only grow into a real financial crisis if the public loses confidence in the banking sector. This theory does not acknowledge the relation between bubbles and the economic cycle. Adherents of the financial instability approach[3] (a post-Keynesian concept), on the other hand, regard asset price bubbles as the result of irrational behaviour on the part of investors and acknowledge the relation between price bubbles and the economic cycle. The view prevails that in the event of price bubbles the central bank should play a positive role in moderating the unfavourable impacts on the real economy. This view is shared by both monetarists and proponents of the financial instability theory[4] (ie post-Keynesians) as well as the adherents of asymmetrical information[5] (ie, institutionalists).

Asset prices are also influenced by other factors, which are chiefly present in the new market economies. These contribute to the uncertainty over the true level of asset prices and thus to uncertainty concerning the future response of asset prices to monetary policy. Among them are restricted access to information, weak and uncompetitive markets and volatile macroeconomic indicators.

As is clear from the above survey, asset prices are determined by a variety of diverse factors whose weight changes over time. This means that in order to assess the price development of assets it is necessary to know both the specific type of asset and the structure of factors that applies to the relevant asset at any given time.

Some work has been done in constructing an aggregate asset price index.[6] Its **reliability factor** depends on the one hand on the concept of its construction and on the other on the quality of the data used. In essence, there exist two fundamental criteria for the selection of assets in the index. The first is the sufficient ratio of the relevant asset to the wealth of the private sector, which guarantees the proper representative character of the affluence of the whole of society. The second criterion is sufficiently high liquidity on the publicly organised markets.

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1 Some of the more important authors in this field are Fama, Miller, Modigliani and Sharpe.

2 See Friedman and Schwartz (1963).

3 See Minsky (1975).

4 See Minsky (1986).

5 See Mishkin (1991).

6 Borio et al (1994).

In the technical sense of the word, the construction of the relevant asset price index is quite problematic. The assets market contains a wide variety of heterogeneous products. And it is precisely the differences between assets that have a powerful impact on the overall value of the aggregate index and its **reliability factor**. Nevertheless, in general we can say that despite these limitations, asset prices represent a major source of information for the central bank's monetary policy decision-making.

III. Asset prices and monetary policy

A. The importance of asset prices for the central bank's monetary policy

The importance of asset prices for monetary policy rises in correlation with the development of the financial markets. Information from the financial markets can be used in timing specific monetary policy measures. This means that asset prices can suggest whether the measures will be effective. Opinions differ on whether the central bank should respond to asset price changes. One line of thinking is that the central bank should include asset prices in the overall target price index. Others believe that asset prices are only relevant for monetary policy if they affect the forecast for future inflation, or if they threaten the stability of the financial system. The optimal monetary policy reaction to changes in asset prices thus depends on their importance in the transmission mechanism and on those factors that influence them.[7]

If fundamental factors are responsible for a change in asset prices then this is justified. An increase in productivity leads to increased company profits and higher share prices. On the other hand, experience tells us that improvements in fundamental factors almost always result in a higher dynamic for asset prices than would correspond to those factors. Nevertheless, price movements on the assets market generally influence inflation expectations and expectations of future economic growth. This is due to the fact that asset prices are strongly influenced by expectations of future returns, which themselves are dependent on expectations of future economic activity, inflation and monetary policy. The use of asset prices as a sufficiently reliable indicator thus depends to a large extent on whether the relevant expectations are determined by fundamental economic factors.

Taking account of asset prices for monetary policy in general has its adherents and opponents. The argument for the inclusion of asset prices in the monetary policy planning concept is based chiefly on their forward-looking character, which corresponds to current monetary policy approaches based on medium to long-term outlooks. It's frequently emphasised that financial assets very easily monitored, only revised in exceptional cases, and stand out for their statistical reliability. Those who argue against their inclusion in monetary policy claim that there is no reason to expect the repetition of previously-monitored links between asset price developments and monetary policy objectives. The reason is the strong dependence on expectations. If the price volatility of one type of asset can successfully be reduced, this volatility may switch to other assets.[8] The inclusion of speculative price fluctuations on the assets market between the mediating objectives of monetary policy may make it less transparent for the public. Monetary policy responses to price fluctuations on the assets market thus do not necessarily lead to their stability. On the contrary, future prices may have a tendency to greater volatility. This applies particularly in cases where a monetary policy measure does not fall within previous monetary policy experience and is considered surprising.

The degree to which asset prices can act as sound leading indicators depends to a significant extent on whether the expectations on which they are based reflect fundamental economic factors.[9] The

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[7] Several studies exist on the impact of monetary policy on asset prices; most of them however focus on the ability to influence financial market interest rates. The Swedish Central Bank, which examined the impact of all instruments used by the central bank on the stock market, including inflation reports and the governor's speeches, concluded that it actually does influence share price levels and market volatility (the question is whether this is desirable). In Japan, a relation was proved between share and land prices on the one hand and real economic indicators on the other. Share and land prices are therefore important indicators.

[8] See Dornbusch's "Overshooting model".

[9] Information effectiveness has been addressed by, for example, Le Roy, Kupiec, Borio, Kennedy and Andersen.

assessment of the significance of asset prices in the context of monetary policy represents a relatively new subject, one which in certain respects objectively meets with inappropriate methodological approaches and opinions. Nevertheless, it is a matter of importance for the majority of central banks. The reason is the fact that the development of asset prices and monetary policy register definite mutual links, which it is useful to take into account when considering the various approaches in monetary policy.

B. The impact of monetary policy on asset prices

Monetary policy may influence asset prices in a variety of ways. One of these is the so-called rational approach,[10] which consists of the setting of short-term rates by the central bank. This then influences asset prices in the economy through the rates. A second method is the monetary approach,[11] which is essentially based on the volume of disposable financial resources for the purchase of assets. It proceeds from the fact that there are only two basic ways in which people can dispose of their money. Either they can spend it on buying goods and services, which ultimately increases economic activity, or they can save it through purchasing financial assets.

The development of asset prices is also connected to a number of macroeconomic variables that stand at the hub of monetary policy. For example the relation between *financial assets and the money supply*. If the money supply exceeds demand for money a certain surplus will probably be spent on the acquisition of assets, asset prices will rise, and vice-versa. The reasons why asset prices are relevant for the demand for money are clear. Higher aggregate asset prices are logically linked to the higher value of financial transactions and real assets. A rise in asset prices also increases the overall wealth of a society, which can positively affect demand for money.[12]

Other such links include the relation between *asset prices and credits and the offer of and demand for savings*. The relation between credit and asset prices is many-sided; economic subjects may use credit directly for the purchase of real and financial assets. A direct result of a rise in prices is therefore an increase in the credits issued by financial institutions. The expansion in the assets side of the balance sheet (credits) appears on the liabilities side (money supply). Of particular significance in the relation between asset price development and demand for savings is the link between the development of the offer of savings in the economy and the overall demand of economic sectors for financial resources. If the offer of savings in the economy as a whole exceeds demand for financial resources, a certain surfeit will be spent on existing assets, whose prices will thus tend to rise. Alternatively, if the offer of savings is lower than demand for financing in the economy as a whole, existing assets will be sold and their price will instead tend to fall.

One of the key links between the development of asset prices and the central bank's monetary policy is the relation between *asset prices and inflation*.[13] Analysis of this relation is important in deciding whether monetary policy should respond to asset price developments or not. A theoretically positive or negative relation between the expected inflation rate and nominal asset prices depends on the correlation between inflation and returns on assets. The level of consumer prices may also be directly affected by an increase in asset prices, or indirectly through changes in household expenditure.

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[10] See BIS (1998).

[11] See Borio et al (1994).

[12] Grice and Bennett were the first to attempt to include affluence in the conventional function of demand for money. Other authors include Hall, Corker and King. M Friedman analysed the impact of share prices using a narrow definition of money and concluded that asset prices should be treated in the same way as an alternative income rate.

[13] This has been examined, among others, by Modigliani and Cohn (1979), Gultekin (1983), Solnik (1983) and DeFina (1991).

IV. Asset prices in the Czech Republic

A. Asset prices during the Czech Republic's economic development to the present

Asset prices during the decade-long history of the Czech economy have developed in different ways at different times. Abroad, price fluctuations on the asset market can partially be explained by upturns in the economic cycle. In the case of the Czech Republic, asset price movements have been associated primarily with the economy's transition from a planned to a market-oriented economy.

In the first case, this meant the impact of the *change in ownership structure*. In the space of a few years, an enormous volume of property changed owners. This change took several forms which, from the point of view of prices (or rather the valuation of the property), had no comparison with, and in terms of their rapidity no analogy outside, the transforming economies. *Price, business and financial liberalisation were also important*. A significant proportion of prices in the economy were liberalised and barriers limiting the imports of foreign goods and preventing the free movement of capital were relaxed. The Czech Republic thus joined those economies for which a high level of openness is customary.

Another factor determining the structure and price fluctuations of the asset market was the *creation of a financial market* which at the beginning of the economic transformation was practically non-existent. Initial price relations did not reflect the real value of individual financial assets. The first significant change towards more realistic prices in this area took place in 1990 with the devaluation of the Czech currency and again during the currency turbulence of May 1997. The Czech financial market was shown to be easily vulnerable and influenced by external factors in a context of inter-connected world markets. Similarly, share prices from voucher privatisation fell sharply after their introduction on the stock market (1993-94) and even in the following years failed properly to reflect the real value of company assets. Only with the economy's subsequent restructuring at the end of the 1990s did their prices begin to reflect companies' performance in the conditions of a market economy.

B. Definition of assets in the Czech Republic

The period of economic transformation saw the creation of the following categories of financial and non-financial assets, which form the subject of analysis of the asset prices channel as part of the monetary transmission mechanism of the CNB's monetary policy. The chief financial assets[14] include securities, household assets in the form of building savings and capital pension insurance. Non-financial assets include real estate, land ownership, production equipment and other immaterial assets. The detailed assets structure in the Czech Republic is evident from the following diagram.[15]

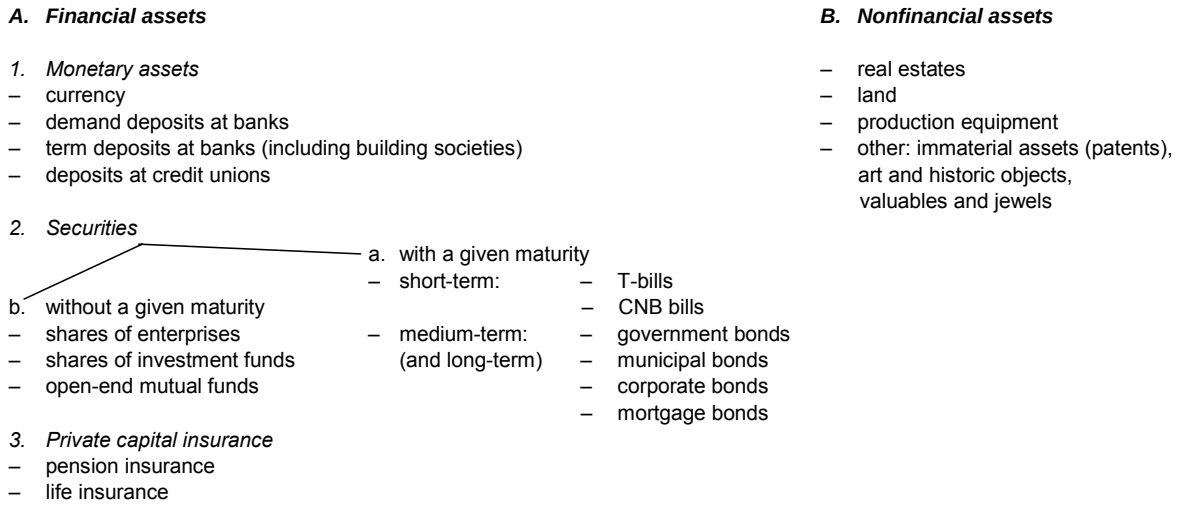
The development of financial and non-financial asset prices in the Czech Republic differed markedly for individual assets from the beginning of the economic transformation period. It's important to note that at the beginning of the 1990s almost none of the aforementioned financial assets existed, with the exception of some forms of life insurance. Financial assets were overwhelmingly in the form of cash or deposits and only with the development and strengthening of the liquidity of basic segments of the financial market did alternative forms of financial investment begin to emerge. This development was understandably reflected in the development of their prices. This applied primarily to the over-valuing of asset prices in the form of company shares and investment funds in the mid-1990s, which was linked to the economy's general imbalance. We may describe this situation as a transformation bubble in this asset segment.

[14] In accordance with the definition of the monetary transmission mechanism in Section 5 we do not include among asset prices financial assets in the form of currency and deposits since these are examined by other transmission channels.

[15] We leave to one side the fact that Czech subjects may also own assets abroad in the same or similar structure.

Figure 1

Assets in the Czech Republic



Certain non-financial assets, in particular real estate prices, developed similarly. At the beginning of the 1990s, real estate prices rose markedly due to the limited supply and high demand. Only with the gradual deepening of liquidity on the real estate market, chiefly as a result of the construction of new houses, flats commercial and production premises, did this asset market start to see more realistic price relations at the end of the 1990s. The deformation of the asset prices with respect to real estate also impacted on the credit market. On the one hand, they acted as unrealistic and low-liquidity collateral, on the other hand institutional conditions (the Act on Bankruptcy and Settlement) also hindered the recovery of collateral. As a result, deformations on the capital market and the real estate market were reflected in banks' worsening portfolios and the subsequent credit restrictions by banks.

An international comparison reveals that the ratio of financial assets to GDP in the Czech Republic still falls short of the figure recorded in advanced countries. The structure of financial assets also differs and reflects both the structure of the financial market and certain historical correspondences with regard to the preferences of household investments. In the Czech Republic, households continue to prefer to hold currency and invest in deposits. The following table provides a comparison of the asset price structures of different countries.[16]

Table 1

Structure of financial assets held by households in selected countries in per cent (2000)

	Germany	France	United States	United Kingdom	Czech Republic
Currency and deposits	36.2	30.4	11.1	22.2	59.6
Equities	15.6	24.8	33.1	17.4	17.7
Other securities	10.1	2.7	6.4	1.3	14.5
Mutual funds	10.5	9.0	12.9	5.5	4.7
Life insurance	13.6	23.3	7.1	27.5	2.3
Pension funds	5.2	1.5	23.8	22.1	1.2
Financial assets as a percentage of GDP	180	234	341	299	121

[16] See OECD (2000).

At present, the CNB pays closest attention to real estate prices within the larger development of asset prices. Recently, this assets segment has recorded quite a sharp price increase, chiefly as a result of expectations associated with the rise in price of apartments and houses following entry into the EU in 2004. Interest in acquiring property has also been stimulated by the lowest ever interest rates in the Czech Republic and the consequent accessibility of mortgages to finance real estate purchases. For this reason, the following two sections address the monitoring of real estate prices in the Czech Republic and the relation between real estate prices and the CNB's monetary policy.

V. Monitoring real estate prices in the Czech Republic

A. Current situation

Since 1997, the Czech Statistical Office, together with the Ministry of Justice, has been developing a system to monitor real estate prices in the Czech Republic. This is the first attempt to gather data from the real estate sphere in the period since 1989. An important milestone was the introduction of Act no 151/1997 Coll., on Asset Evaluation, which stipulates the obligation of the tax authorities to pass on to the Ministry of Finance and the Czech Statistical Office data from tax declarations concerning prices established by real estate evaluations and prices agreed for real estate in the case of sale. The Act came into effect as of 1 January 1998.

Certain requirements are placed on the development of the real estate price monitoring system. First, it should be reliable and up-to-date and should provide information on the price level spread according to the types of real estate, their location and other determining factors, including the development of this spread in time. The system should provide global information at a macroeconomic level and should thus not duplicate the so-called price maps which are compiled by local administrative bodies for their own purposes.

The system's data comes from real estate tax declarations, which owners or sellers of real estate are obliged to provide to the tax authority within 30 days of receiving a registered purchase agreement from the Land Registry. A database for tax was established by the tax authorities for tax declarations provided in 1998, ie, the data has been collected since February 1999 (with an average gap of seven months from the sale date, or delivery of the real estate tax declaration). The tax authorities have identified the following types of real estate from the declarations in the database: buildings and halls, family houses, recreational cottages and homes, recreational and gardeners' huts, garages, wells, apartments and non-residential premises, building plots, agricultural land and forest land. These data, which are owned by the Ministry of Finance, are electronically sent to the Czech Statistical Office on a monthly basis in coded form.

The chief advantage of this resource is that it comes from real, paid (declared) prices and is therefore a comprehensive, regular and optimised data flow on price transactions on the real estate market. The only problem may be distortions caused by the possibility that the declared price is not always the same as the price actually paid. Nevertheless, in a relative comparison of prices over time and generally also in the real estate's location this objection has no weight since it can be posited that any such distortion remains, on average, constant.

The Czech Statistical Office used this database to compile the publication in 2002 of "Prices of Monitored Types of Real Estate between 1998 and 2000" (ČSÚ (2002)). The publication, which is mostly analytical in character, provides information on real estate's price dependence on a variety of determining factors. The explanatory priority variable in the publication's tables is a unitary purchase price, and from that a price index, which is a proportion of average prices from two different time periods. The explanatory variable expresses mainly location and time, followed by wear and tear and the size of the community. Only single-apartment brick family homes, apartments, multi-dwelling buildings, brick garages and building plots were selected from those on the database as they fulfilled the criteria of sufficient volume and homogeneity.

The selection of explanatory factors and of real estate types for this publication (for the years 1998-2000) is the result of extensive numerical analyses, of which the most important is probably the analysis of the seasonal character of sales. Also of interest is the analysis of the stipulation of the relative degree of average unitary price in each of the explanatory factors and the analysis of the connection between the unitary price and the size of the building plot.

The study also showed the relatively precise dependency of the unitary price on wear and tear, which makes it possible to conduct a hypothetical calculation of the price of a new family home for each price given (the Czech Republic can be divided into two localities - more expensive and cheaper). The price diffusion is greater in localities with a higher price level.

The statistical analyses were used to stipulate the maximum extent of a set of tables as one of the publication's objectives had been to find the maximum reliability factor of the current state of data, or to define the border for the reliability factor of the examined from a perspective selected in advance. This classification pointed to uneven data coverage from various regards and thus to the urgent necessity to improve the statistical system for the monitoring of real estate.

B. Proposals to improve data collection

Due to the character of the data resource (data from tax declarations owned by the Ministry of Finance) the information provided on real estate prices cannot be absolutely up-to-date. For the future, the Czech Statistical Office is considering the annual publication of "Monitored Real Estate Prices". The next publication, which comes out at the end of 2003, will cover the period 1998-2002. The Office's objective is to shift the publication's **reliability factor** to the real estate price indices; however, because the available data do not provide adequate information for the calculation of clean price indices, it will be necessary to apply more demanding statistical methods which place higher demands on sources. Nevertheless, the publication under preparation will also contain an aggregated real estate index for selected types of real estate, or for those types of real estate for which an index can reliably be constructed. For the future, the Czech Statistical Office is considering the creation of standard, long-term schedules for real estate price indices. The aforementioned character of the data resource is a further reason why real estate price indices cannot be entirely up-to-date.

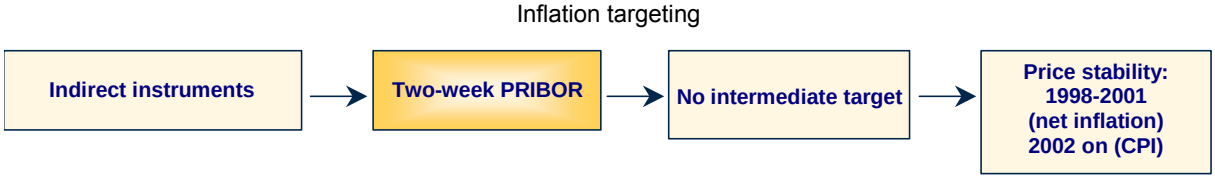
VI. Real estate prices and CNB monetary policy

A. CNB monetary policy and the monetary transmission mechanism

Since 1998, the CNB's monetary policy has been based on the so-called inflation targeting regime. The changeover from so-called currency targeting, which was practised from 1990 to 1997, to inflation targeting was caused by the loss of the nominal currency policy anchor in the form of the exchange rate during the exchange rate turbulence of May 1997, subsequent rise in inflation and the associated rising inflation expectations and the necessity to increase overall transparency and consistency of the CNB's monetary policy. The monetary policy scheme from 1998 to the present is given in the following graph.

Figure 2

Monetary policy scheme from 1998 to date



Since 1998, when the Czech Republic became the first transforming economy to introduce an inflation targeting regime, this form of monetary policy has been significantly developed. This applies above all to the target itself, which, since 2002, has been the overall consumer price index instead of "net inflation"[17]. Other important changes include, for example, the switch from defining targets for specific

[17] Net inflation = the total consumer price index less changes in so-called regulated prices and indirect taxes (approx 20% of the price index).

years to a target in the form of a ***continuous band***, the change from a conditional to an unconditional prognosis, greater transparency in the CNB's monetary policy through the publication of future inflation factors, the voting ratios of the Bank Board members etc.

An important feature of the CNB's monetary policy is the inflation prognosis, which is the result of the CNB's short- and medium-term macroeconomic prognosis. When compiling the prognosis, the CNB proceeds from a number of theoretical postulates, but also from empirical information which are the result of a permanent analysis of the monetary transmission mechanism (MTM) in the Czech Republic.

The study of the MTM in the Czech Republic is one of the basic areas of research in the CNB. For example, as part of the research from 1998,[18] the following six channels were defined:

- CNB action on interest rates on the interbank deposits market (PRIBOR)
- the impact of interbank deposits market interest rates on other financial market interest rates
- the impact of financial market interest rates on the exchange rate
- the impact of the exchange rate and interest rates on aggregate demand
- the impact of interest rates on demand for money
- the relation of the money supply to inflation and GDP.

With the gradually changing character of the Czech economy, primarily through the economy's restructuring and culmination of economic transformation, changes have taken place in the way economic impulses function in the economy. The asset price channel, which since 1998 has been included in the MTM roughly under the channel describing the impact of interbank deposit interest rates on other financial market interest rates, is currently allocated a separate channel of its own. The effectiveness of the asset channel is closely linked to the level of the financial market's development. The connection between central bank measures and their impact on asset prices is, however, generally not straightforward. The transmission is highly influenced by expectations.[19] At present, the MTM is most often broken down into the following five channels:

- **direct monetary transmission** - classic transmission channel via in which demand for money is influenced;
- **interest channel** - operates through official interest rates determining financial market rates; its effects are manifest in investment, substitution and income;
- **asset price channel** - affects real economic activities through asset prices such as shares, bonds, real estate, land, exchange rate etc. In this respect of chief relevance are Tobin's *q* effects and affluence effects. The exchange rate channel is also incorporated in the assets channel;
- **credit channel** - acts on the economy through the offers of credits and their price,[20] can be sub-divided into two channels: banking credit channel and ***balance sheet channel***;
- **expectations and uncertainty channel** - relates primarily to the credibility of the central bank's monetary policy. A further aspect of the channel concerns the uncertainty of loan contract repayments, eg increased uncertainty at times of recession obfuscates the distinction between good and bad credit risks. The rise in uncertainty thus reduces the ***reliability factor*** of information on the financial markets, while negative selection and moral hazard restrict credit and thus contribute to the fall in economic activity.

The increasing significance of the asset prices channel in the MTM, which has also become a feature of CNB monetary policy over the past two years, chiefly stems from the change in the microeconomic

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[18] Eg Arlt et al (1998).

[19] Among the major authors to have written on the role of asset prices in the MTM as part of their studies are Von Mises, Keynes, Kindleberger, Minsky, Friedman and Kuttner.

[20] See Bernanke and Blinder (1988), Gilchrist and Zakrajšek (1995) and Peek and Rosengren (1995).

environment. This is the process of globalisation, deregulation and financial liberalisation,[21] which has led to changes in the perception of monetary policy in many countries, or a switch to inflation targeting, in which expectation plays a major role. Another important factor that has influenced the earmarking of a separate asset price channel in MTM is the experience of many countries which, as a result of rising asset prices and their subsequent fall, suffered major financial instability and high losses in the banking sector. The final factor contributing to the greater attention paid to asset prices as a separate channel are the fundamental characteristic features of asset prices, but in particular their information content. The aforementioned factors are the reason why the CNB's monetary policy also focuses on asset prices and within them real estate prices. This focus is the result of similar factors to those abroad, ie, the impact of globalisation, deregulation and financial liberalisation on monetary and economic development in the Czech Republic.

B. Real estate prices as a factor in CNB monetary policy

CNB monetary policy pays close attention to developments in real estate prices. Yet this asset's role in the process of monetary policy remains limited and only indicative. This is mainly due to insufficient current information on asset price developments in this segment. As has already been mentioned, data are obtained more than a year in arrears and even with an improvement in data collection the delay in publishing statistics on real estate prices will be almost one year. Monetary policy thus uses partial information from a variety of statistical surveys provided by the large real estate agencies. Currently, the CNB, in conjunction with the Czech Statistical Office, is attempting to speed up the data collection procedure and possibly to introduce current studies on the development of real estate prices in the Czech Republic.

The second reason for the purely indicative role of real estate prices in monetary policy is the specificity of real estate market developments in the Czech Republic, mainly due to the culmination of economic transformation and the Czech Republic's entry into the European Union. Real estate prices continue to narrow the gap with prices that are normal in the European Union, depending on the level of economic development of the various regions of the Czech Republic. Any increase in real estate prices over the last year (eg +20% in Prague) is recorded as significant; real estate prices in the capital are also only coming nearer to those common in the European Union. If we take into account that, at an economic level, Prague is around 130% of the EU average, this development can be considered as justified. Further price movements should however be linked chiefly with economic developments in the Czech Republic.

Real estate prices also only play an indicative role in CNB monetary policy because of the absence of any empirical evidence that real estate prices influence household consumption habits and company investment. It thus proceeds chiefly from theoretical assumptions on the impact of real estate prices on economic development.

When examining the *impact of real estate prices on household consumption*, we assume the existence of three channels. The first is the classic *affluence effect* associated with F Modigliani. In his concept of the consumption function, based on the model of the life cycle, consumer expenditure is determined by lifetime resources which form financial wealth, real and human capital. Since real estate comprises the decisive part of assets in the household portfolio, it can be assumed that with its increase in price the consumers' lifetime resources increase and with it their routine expenditure. From a macroeconomic point of view, there is an increase in aggregate demand. In the Czech Republic, the affluence effect has yet to manifest itself to any meaningful extent. Apartments and family houses are very rarely used for investment purposes. The second channel acts through the *possibility of using*

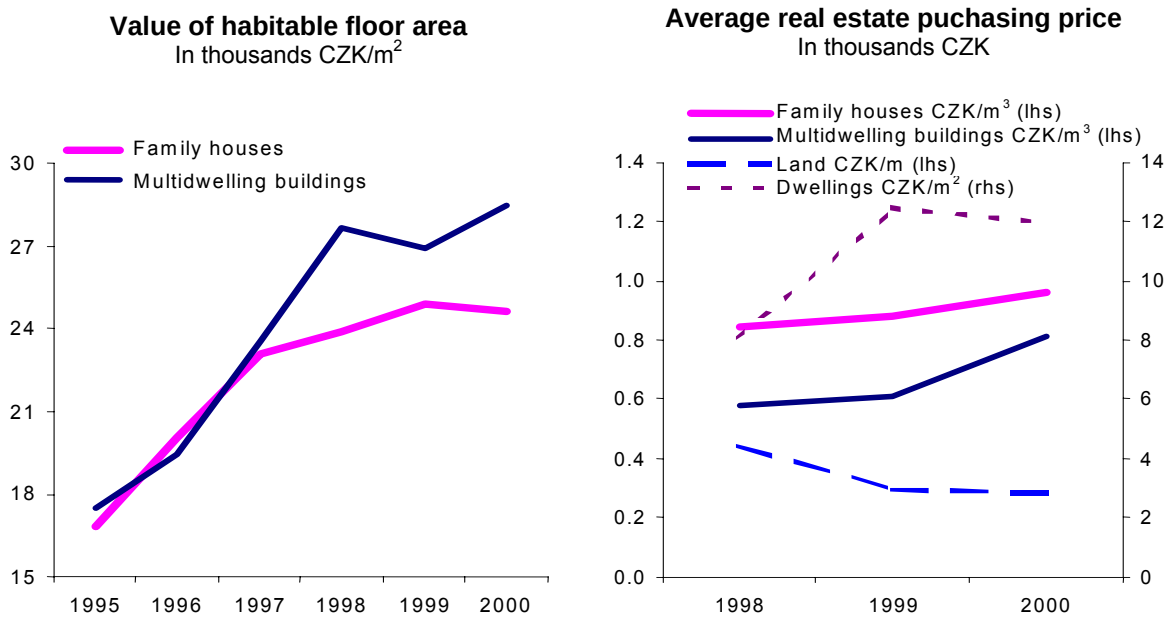
[21] Liberalisation on the financial markets and related procedures leads to:
- a reduction in interest margins, to which banks react by entering into higher risk transactions (eg credit for the purchase of shares and real estate)
- a significant shift in banking credit from the public sector to the private sector
- easing access of the private non-financial sector to credit
- diversification of the assets and liabilities sides of the balance sheet of the private, non-financial sector
- a reduction in the proportion of fixed interest rates in favour of variable interest rates
- securing credit by means of collateral in the form of financial assets
- a general expansion of securities holdings at the expense of traditional forms of savings.

real estate as collateral for credit. For owners, real estate represents highly valuable collateral since credit secured on its basis is, in comparison with other types of credit (personal loans, credit cards), generally cheaper. The increase in real estate prices thus directly influences the accessibility, or potential credit capacity of a household with a direct impact on consumption. In the Czech Republic it is unlikely that a relation through collateral will become more pronounced. The third channel acts through *additional expenditure arising from the acquisition of real estate*. This applies to purchases of items long-term consumption which, while they are considered investments from the point of view of economic theory, from the standpoint of statistical monitoring they are categorised under normal consumption in the system of national accounts. Over the past few years in the Czech Republic, the rise in consumer demand has been closely connected with the process of equipping items of long-term consumption in relation to the rise in the proportion of new real estate in household ownership.

The impact of real estate price development on company investment is assessed using Tobin's *q* theory of investment and the credit channel theory. Under the former theory, real estate is assessed in the same way as other assets (eg shares), ie, an increase in the price of real estate - for example in the event of a relaxation of monetary policy - increases Tobin's *q* (the market price of real estate divided by costs for the reproduction of real estate) and thereby stimulates its new construction, or investment generally. On the other hand, the volume of investment in real estate reduces in the event of a fall in the price of real estate, ie, if there is a tightening of monetary policy. Real estate is often used as collateral when providing credit. Therefore, *changes in real estate prices, or requirements for collateral quality (on the part of commercial banks and banking supervision) may influence the volume of overall credit in the economy, particularly investment credits*. A tightening up of monetary policy (increased interest rates) can result in the fall in the values of collateral and thus to restriction on the credit supply (and vice-versa). In addition, a change in real estate prices may alter the value of a bank's and company's portfolio, or balance sheet, which in turn means a change in the position for the provision and obtaining of credit, or debt repayment.

From the Statistical Year-Book of the Czech Republic and the publication "Monitored Real Estate Prices 1998 to 2000" it is evident that real estate prices continue to rise (between 1995 and 2000 the value of unitary habitable floor area in family houses and multi-dwelling buildings rose by approximately 50%), as the following graph and table indicate.

Graph 1



Source: Czech Statistical Office.

We can expect that in the future the asset price channel in the real estate segment will function very differently due to increased competition and the introduction on the market of financial innovations.

This should particularly cover mortgage financing which is more accessible to a wider circle of clients, not only through falls in mortgage rates but also the provision of new mortgages to refinance existing mortgages and the introduction of flexible mortgage products. The development of real estate prices as part of the analysis of asset prices should thus play an increasing role in the CNB's monetary policy.

Table 2

Value of habitable floor area

In thousands CZK/m^2

Year	Family houses	Multidwelling buildings
1995	16,826	17,528
1996	20,063	19,457
1997	23,109	23,542
1998	23,913	27,688
1999	24,899	26,902
2000	24,654	28,470

Source: Czech Statistical Office.

Average real estate purchasing price

	1998	1999	2000
Family houses CZK/m^3			
Prague	2,914	3,102	3,069
CR	843	880	959
Dwellings CZK/m^3			
Prague	19,228	22,954	26,296
CR	8,077	12,453	11,936
Multidwelling buildings CZK/m^3			
Prague	701	849	1,206
CR	580	612	812
Land CZK/m^2			
Prague	3,158	3,152	3,183
CR	444	296	285

Source: Czech Statistical Office.

VII. Conclusion

Real estate prices are one of the prime indicators for the development of asset prices in the Czech Republic. The development of real estate prices is reflected in the specifics of the period of transition that the Czech economy went through in the 1990s. This period is characteristic for the emergence of a transitional price bubble on the real estate market at the beginning of the 1990s, when the enormous demand for this asset without corresponding response on the part of supply led to an unfounded increase in prices. With the restructuring of the Czech economy in the second half of the 1990s and the gradual convergence of the Czech economy with the EU, the Czech real estate market gradually came to function more efficiently. The market is currently experiencing a rise in prices as a result of expectations concerning the development of real estate prices following the Czech Republic's entry into the EU and the accessibility of funds to invest in this asset.

Real estate prices have begun to take a central position in the CNB's monetary policy in the last two years, during which time monetary policy has been based on an inflation-targeting regime and has

focused more on the comprehensive study of the monetary transmission mechanism and attention to a variety of financial and non-financial indicators of monetary and economic development. Real estate prices are one of these indicators.

An analysis of the development of real estate prices as part of an analysis of the monetary transmission channel comes up against data problems. In 1997, the Czech Statistical Office, in conjunction with the Ministry of Finance, setup a system to gather information on the development of real estate prices. At present, data are available on real estate prices from 1998 to 2000. The current system represents a very solid basis from which to proceed and make it more efficient. The major challenge for the Czech Statistical Office is the acquisition of more up-to-date information and the construction of an aggregate price index for the development of real estate prices.

We expect that, once an effective data gathering system has been put in place for real estate prices in the Czech Republic, the CNB's monetary policy will be able to focus more on analysing this indicator of monetary and economic development. In line with the theoretical preconditions and results of empirical research we may expect that the development of real estate prices in the Czech Republic will likewise have a standard effect on household consumption patterns and companies' investment decisions.

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