



German Economic Team Moldova

Policy Paper Series [PP/03/2011]

Credit Growth in Moldova: Empirical Analysis and Policy Recommendations

Enzo Weber, Robert Kirchner

Berlin/Chişinău, July 2011

About the German Economic Team Moldova

The German Economic Team Moldova (GET Moldova) advises the Moldovan government and other Moldovan state authorities such as the National Bank on a wide range of economic policy issues. Our analytical work is presented and discussed during regular meetings with high-level decision makers. GET Moldova is financed by the German Federal Ministry of Economics and Technology under the TRANSFORM programme and its successor. Our publications are publicly available at our website (www.get-moldova.de).

German Economic Team Moldova

c/o Berlin Economics

Schillerstr. 59

D-10627 Berlin

Tel: +49 30 / 20 61 34 64 0

Fax: +49 30 / 20 61 34 64 9

E-Mail: info@get-moldova.de

<http://www.get-moldova.de>

Credit Growth in Moldova: Empirical Analysis and Policy Recommendations

Executive Summary

The experience in several transition countries shows that credit growth can at times be rather high. When faced with such a situation, banking supervisors and policy makers need to answer a crucial question: Is the observed high credit growth a sustainable equilibrium phenomenon explained by a catching-up process or are we dealing with an unsustainable credit boom or bubble, which could burst soon and cause macroeconomic and financial sector instability? Finding the right answer to this question is of paramount importance, because otherwise the policy reaction would be inappropriate. Long-term credit growth could be unnecessarily reduced, with negative consequences on investment and growth. Or the authorities could fail to prevent a financial crisis with severe impact on the real economy.

In order to answer this question, the authorities need reliable analytical tools. In this paper we apply (for the first time) standard analytical tools to credit growth in Moldova during 1995-2010. The results verify that Moldova displayed two distinguished periods of credit booms in its recent past. The first credit boom developed around 1998, just before the Russian crisis. The second boom developed during 2007-2009 after some years of very strong economic growth, and just before the global crisis hit the country.

These results confirm that the authorities need to be vigilant, monitoring the pace of credit creation very closely. The approaches discussed in this paper contribute to such efforts. Furthermore, in case the models signal that credit growth turns excessive, the authorities need to deliver a comprehensive policy response in order to keep credit growth in line with the development of economic fundamentals. We discuss a wide range of possible policy options, ranging from macroeconomic policies to prudential and supervisory tools.

Authors

Enzo Weber Enzo.Weber@wiwi.uni-regensburg.de

Robert Kirchner kirchner@berlin-economics.com +49 30 / 20 61 34 64 2

Acknowledgements

The authors would like to thank the National Bank of Moldova for providing the data used in this paper. We also like to thank Balázs Vonnák from the National Bank of Hungary for sharing his estimation results with us.

Contents

1. Introduction

2. Credit Growth in Moldova: Stylised Facts

3. Theoretical and Empirical Framework

3.1 Empirical Definition

3.2 Methodology

3.2.1 Statistical approaches

3.2.2 Fundamental approaches

4. Estimation Results

4.1 Statistical approach

4.2 Fundamental approach

5. Policy Recommendations

6. References

Annex

A.1 Data

A.2 Description of the fundamental approach by Kiss et al. (2006)

1. Introduction

In many Central and Eastern European countries (CEECs), credit to the private sector has risen rapidly during the transition process, and became an important topic on the economic policy agenda. Many observers considered the rapid pace of credit expansion as excessive, contributing to an overheating of domestic demand as evident by rising inflation, a deteriorating current account and asset bubbles¹. According to their views, a credit bubble had developed, which had to burst at some time, with negative macroeconomic implications and severe financial stability risks. A robust finding in the relevant literature is indeed that excessive credit growth often precedes financial and banking sector crises.

However, from an ex-ante point of view, this conclusion deserves some caution. Strong credit growth can also result from a catching-up process and thus be considered an equilibrium phenomenon in a rapidly growing transition economy moving from a planned towards a market economy ("sustainable credit growth"). Further empirical research is thus necessary to distinguish fundamentally justified credit growth from credit bubbles.

Our contribution in this paper is to conduct such a quantitative analysis for Moldova and provide policy recommendations based on the results. By doing so, we extend the empirical literature on this issue for a country which has not been analysed so far (to the best of our knowledge) and still stands at the early stages of the convergence process. The structure of the paper is as follows: In chapter 2 we present some stylised facts about private sector credit growth in Moldova. Chapter 3 deals with the theoretical and empirical framework of our analysis. The results of our estimations are shown in chapter 4. In chapter 5 we conclude with some policy recommendations.

2. Credit Growth in Moldova: Stylised Facts

This chapter deals with the empirical patterns of credit expansion in Moldova over our sample period 1995-2010². In line with the literature, we focus on credit to the private sector, i.e. corporates and households, extended through the local banking system.³ We will discuss different aspects of credit expansion like credit growth, credit penetration (credit-GDP ratio), or the currency and sectoral breakdown in more detail in the following sections.

¹ See Duenwald et al. (2005) for a more detailed exhibit.

² Depending on data availability and econometric issues, the starting point for individual series is 1995:I – 1996:I.

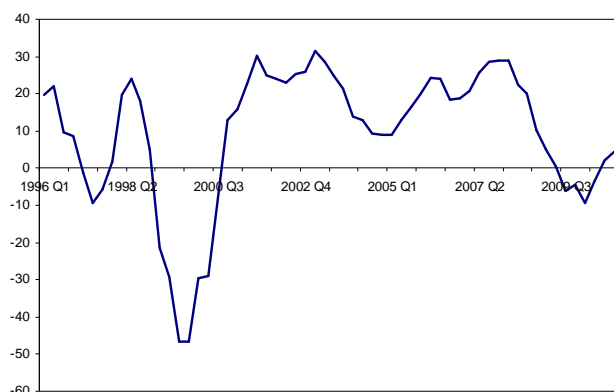
³ This excludes credit issued by foreign banking institutions directly to domestic clients like big corporates, as data on such transactions were not available. Similarly, the role of non-bank financial institutions is not captured in the data.

Credit growth

The following figure shows the annual credit growth rate in Moldova. We deflated the nominal figure by inflation⁴ in order to show the real rate of expansion.

Figure 1

Real private credit growth in Moldova (% yoy)



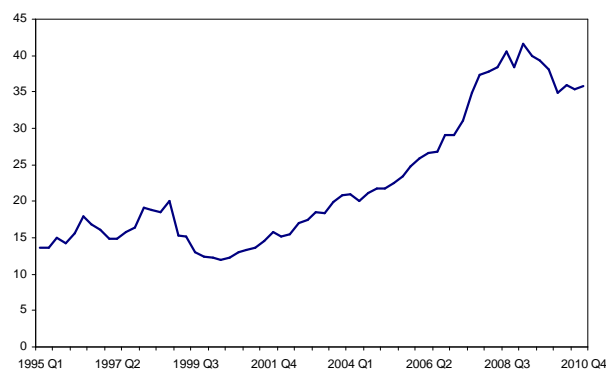
After some volatile period at the beginning of the sample, the aftermath of the Russian crisis 1998 caused a sudden and steep drop in real credit growth, which bottomed at almost -50% in 1999. From this low, growth started and hovered between 10% and 30% for most of the following decade. The recent global crisis caused growth to fall again into negative territory, even though a stabilisation has been reached recently.

Credit penetration

The figure below shows the level of credit penetration in Moldova, measured in percent of (seasonally adjusted) GDP.

Figure 2

Credit-GDP Ratio (in %)



The long-term increase in credit penetration over time is clearly visible in the data, with two peak phases during 1998 and 2007-2009. A crucial question, which we attempt to answer in the following chapters, is if this development was supported by economic

⁴ We used the consumer price index (CPI) for deflating credit growth.

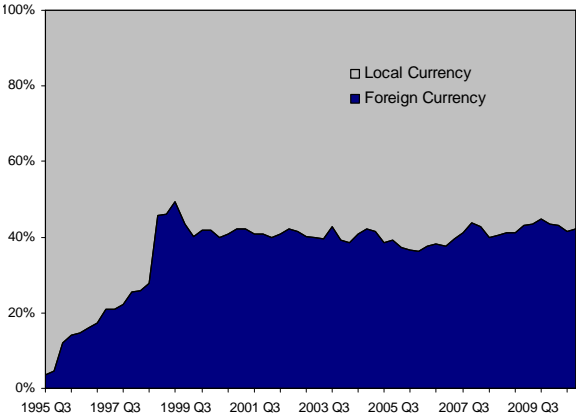
fundamentals (e.g. GDP-per-capita) and can thus be considered an equilibrium phenomenon, or if it must be considered excessive.

Currency breakdown

In line with other transition countries, a considerable amount of loans is denominated in foreign currencies, mainly the US dollar. The figure below shows the share of local and foreign loans in the overall loan stock in Moldova.

Figure 3

Currency structure of loan stock



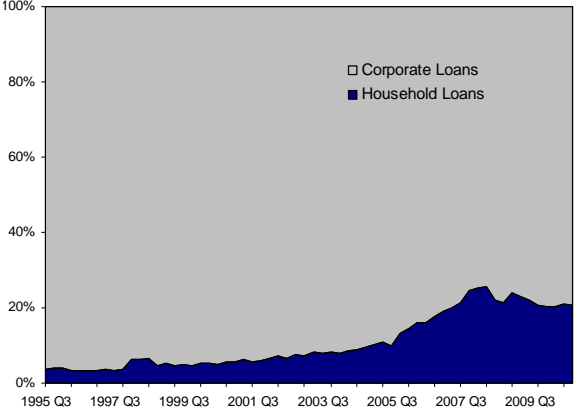
Again, after some volatility in the second half of the 1990s, the share of foreign currency-denominated loans stabilised at around 40% of total loans, without any big movements in either direction.

Sectoral breakdown

The share of corporate and household loans⁵, respectively, in total loans is shown below.

Figure 4

Sectoral breakdown of loan stock



⁵ In our dataset covering the private sector, this refers to „claims on non-financial corporations“, and “claims on other resident sectors“, respectively.

The sectoral decomposition of the loan stock reveals that the share of household loans increased significantly over the sample period, albeit from a low level. This phenomenon of surging household lending is well documented in most CEECs, as access to finance broadened and mortgage and consumer lending picked up from an initially very low level.

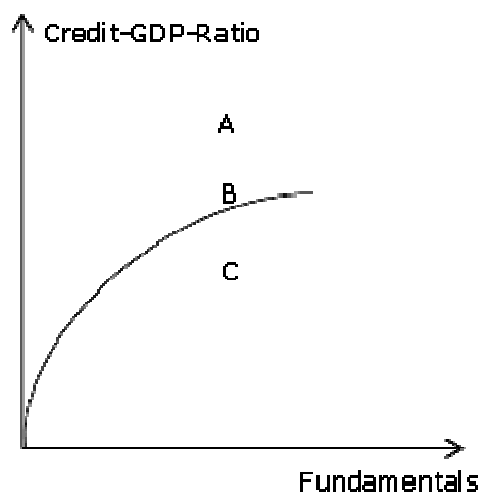
3. Theoretical and Empirical Framework

3.1 Empirical Definition

Before we discuss our theoretical and empirical framework, we specify the exact meaning of the terms “equilibrium level of credit” and “excessive credit booms” as used in our paper. The following, highly stylised figure helps to explain this in more detail.

Figure 5

Stylised Development of Credit



Source: Own display based on Egert et al. (2006), p. 14

The figure shows the credit-GDP ratio that corresponds to the level of economic development, given by economic fundamentals, e.g. GDP-per-capita. This “equilibrium level of credit” usually rises with GDP-per-capita, a process which is called financial deepening (see Egert et al. (2006)) and follows real convergence.

In a situation given by point B, the country is on its long-term equilibrium path given by economic fundamentals. Ideally, the country would move along the line over time, increasing its credit-GDP-ratio. Situation C is not an equilibrium, as the ratio is lower than what fundamentals would predict. This might be due to initial undershooting in the early days of transition, which has not been corrected so far. Importantly, catching-up to the equilibrium path would imply high credit growth rates for a certain transition period.

Point A is of special interest, as we have here a situation where credit is higher than what economic fundamentals would predict. This case of credit overshooting its equilibrium level will be described as “excessive credit”, or simply “credit boom” in the following.

3.2 Methodology

Empirical work that tries to identify such periods of “credit booms” usually applies a number of different approaches, ranging from purely statistical methods to fundamental econometric approaches based to varying degrees on economic theory. We will describe in the following sections two complementary methods that will be subsequently applied in the empirical analysis. The indicator we will use and model in the following sections is the credit-GDP ratio.

3.2.1 Statistical approaches

Statistical approaches try to identify significant deviations from long-term (or equilibrium) trends in the data, which can be interpreted as credit booms. In order to establish the equilibrium credit-GDP ratio, univariate time series methods are applied to the underlying data. In line with the literature, we use the Hodrick-Prescott filter.

The difference between the long-term values obtained from applying the filter and the actual values are the deviations from trend. A crucial question is now to establish a threshold deviation, beyond which we can speak of a credit boom. In other words, what is the “speed limit” for credit expansion, distinguishing “good” from “bad” expansion? Some research contributions⁶ define a (symmetric) band around the equilibrium value. Once this band is crossed by the credit-GDP ratio, this signals a credit boom. In line with the literature, we take a distance of 1.75 times the standard deviation of credit fluctuation around the trend as a threshold value.⁷

3.2.2. Fundamental approaches

The second class of models tries to explain the dependent variable –the credit-GDP-ratio– as a function of a number of economic fundamental variables, like GDP-per-capita, interest rates, inflation, and others by means of econometric regressions. Important contributions in this field, among others, are the papers by Kiss et al. (2006)⁸ and Egert et al. (2006), which try to identify credit booms in a number of CEEC by using a two-stage estimation procedure. We will explain the approach of Kiss et al. (2006) below⁹.

⁶ See Coudert/Pouvelle (2008) and IMF (2004).

⁷ Assuming a normal distribution, this roughly corresponds to the 5% quantile.

⁸ See Kiss et al. (2006), Appendix 2, for a detailed overview of the different fundamental approaches used in the literature until that date.

⁹ The Annex A.2 gives more detailed information on Kiss et al. (2006), since we follow this particular approach for Moldova’s case.

In the first stage, panel econometric techniques are used to estimate the structural relationship between the credit-GDP ratio and fundamental variables mentioned above. The authors use a panel of Eurozone countries. Specifically, error-correction models are formulated to estimate a long-term relationship between the different variables in levels.

The second stage is an out-of-sample exercise, using the estimated long-run coefficients and country-specific constants in the first stage and applying them to a number of CEECs. Thereby, equilibrium credit-GDP ratios for CEECs can be calculated based on the structural relationships identified in the first stage, assuming long-term parameter homogeneity. Using this approach rather than estimating directly on CEEC data avoids the "transition estimation bias", which may appear if too many transition countries are included in the panel (see Kiss et al. (2006)). The underlying rationale is that in the long run, transition countries will eventually converge to their developed European peers. Therefore, the structural linkage between fundamentals and the credit-GDP ratio is adopted from the Eurozone countries, while the values for the fundamental variables will stem from Moldovan data.

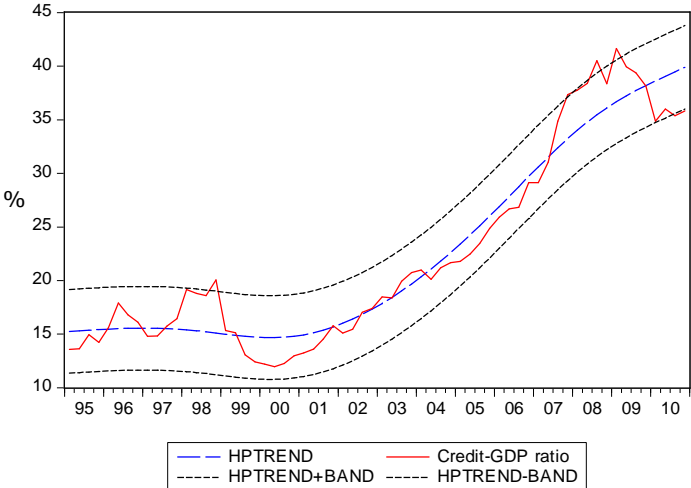
4. Estimation Results

4.1 Statistical approach

Applying the Hodrick-Prescott filter to the data (see figure 2) and setting the threshold band at 1.75 times the standard deviation gives the following results:

Figure 6

Credit-GDP Ratio in Moldova: Statistical Approach



Source: Own estimations

The credit-GDP ratio (red solid line) fluctuates around its equilibrium value (blue dashed line, HPTREND). Most of the time, it stays between the threshold bands (dotted black lines, HPTREND +/-BAND). However, the upper threshold has been crossed twice in the

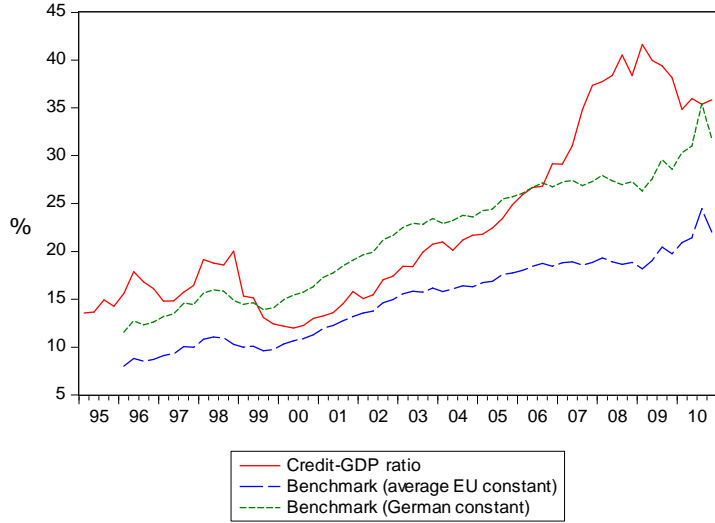
past, indicating a credit boom. This was the first time the case during 1998 (1998:4), before the Russian crisis hit the country, and the second time during the strong expansion 2007-2009, before the global crisis hit the country (2007:4, 2008:3, 2009:1).

4.2 Fundamental approach

As discussed above, we take the estimated coefficients from the first stage of Kiss et al. (2006), and conduct an out-of-sample exercise for Moldova (second stage). The following figure shows the results.

Figure 7

Credit-GDP Ratio in Moldova: Fundamental Approach



Source: Own estimations based on Kiss et al. (2006)

As explained in more detail in the Annex A.2, one of the crucial steps in this approach is to select relevant country-specific fixed effects (constants) from the Eurozone panel (stage 1) in order to derive equilibrium paths of credit. In our analysis, we show two such cases, which in our view are relevant benchmarks. The blue dashed line shows an average of all Eurozone country constants in the sample, and can be thought of as an “Eurozone average equilibrium path”. The green dotted line represents the case of Germany as the biggest Eurozone economy. The red solid line is the actual Moldovan credit-GDP ratio.

The results support broadly the findings of our statistical approach. Both in 1998 and again during 2007-2009 a credit boom developed, as the blue line (the Moldovan credit-GDP ratio) started to deviate considerably from both Eurozone and German benchmarks. During 1999 and 2006, the development was in the range of estimated equilibriums.

5. Policy Recommendations

The macroeconomic and financial stability implications of credit growth raise immediately the fundamental question if and how decision makers (banking regulation/supervision and the government) should react towards such growth.

The starting point of any policy response must be an empirical assessment of credit growth. From the discussion above it became clear that policymakers need to distinguish two separate cases here: If credit growth follows an equilibrium convergence process, no intermediate policy response is warranted. Rather, this process of financial deepening driven by improving economic fundamentals should be broadly supported by the authorities¹⁰. However, it is of paramount importance to closely monitor and analyse credit growth on a permanent basis, using a wide range of appropriate methods and models. Such an “early warning system” helps to recognise risks at an early stage and contributes to the design of an appropriate policy response. Especially when credit levels are leaving the “comfort zone” around their long-term equilibrium trend, particular caution is recommended and respective efforts should be stepped up.

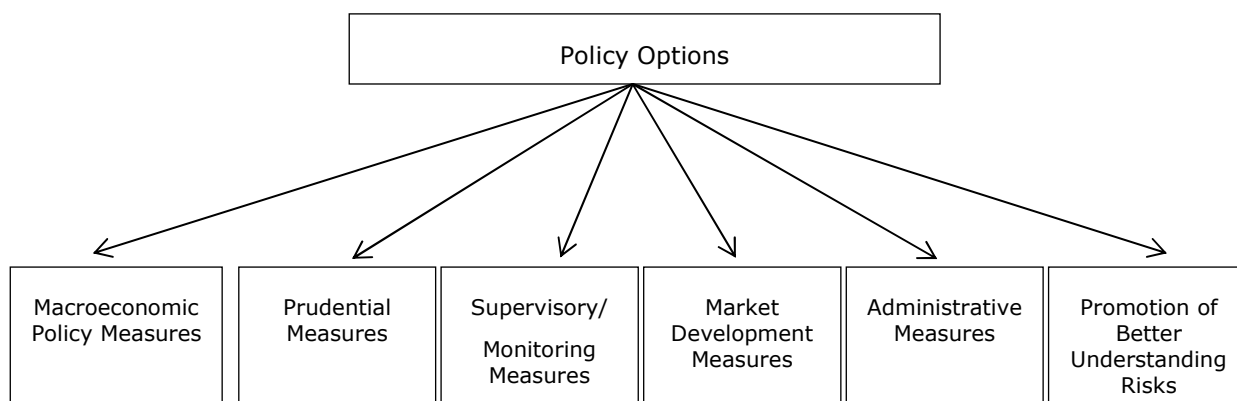
In case credit growth turns into a credit boom, as happened in Moldova during 1998 and 2007-2009, and macroeconomic and financial stability risks loom, policy makers need to act decisively in order to achieve a moderation in credit growth¹¹. It is without doubt that this can be a rather difficult decision: Taking the punch-bowl away when the party is at its best is never popular among the audience. However, policies to mitigate credit booms have clear long-term benefits in promoting sustainable and balanced credit provision and thus economic growth. A good overview of the different policy options can be found in Hilbers et al. (2005) and is shown in Figure 8.

¹⁰ There is a long theoretical and empirical literature on the relationship between the level of financial development and its relation to economic development and growth. See Kiss et al. (2006) for a short overview.

¹¹ We are aware of the fact that to a significant degree, credit growth can be the result of global factors (global liquidity, capital inflows...) rather than domestic ones, however, policy reactions definitely can play an important role in limiting the problems associated with them.

Figure 8

Policy options to address credit booms



Source: Hilbers et al. (2005)

The basic policy options available are discussed briefly below (see Hilbers et al. (2005) for an extensive discussion):

- Macroeconomic measures: The standard macroeconomic instruments relate to monetary, fiscal and exchange rate policy. It is important to note that the concrete exchange rate system in place can limit the available options to a large degree, as does the level of dollarisation. Countries which run currency boards or other forms of hard pegs have basically no room for a monetary policy response. In this case, the main instrument is fiscal policy, which needs to be conducted in a tight and countercyclical fashion to moderate credit growth. Countries with flexible exchange rate systems have more tools at hand, since they can resort to monetary tightening in this case.
- Prudential measures: Among prudential measures, a wide range of instruments can be applied: This starts from tightening capital requirements, loan classifications and provisioning rules, and continues to collateral requirements, concentration rules, FX open position limits and maturity mismatch regulations.
- Supervisory/Monitoring measures: Here, increasing disclosure requirements and a better monitoring of banks' exposure are to mention, coupled with periodic stress testing and an increased role of onsite/offsite inspections and surveillance in institutions that exhibit aggressive lending practices. It is also important to improve the dialogue and coordination among domestic supervisory bodies (e.g. also involving non-bank financial institutions) as well as with corresponding bodies abroad.
- Market development measures: This covers a wide range of issues with the objective to improve the quality of financial intermediation and to have the right institutions in place. In the banking system, institutions like credit bureaus should be established,

and the general legal framework should be strengthened. Accounting by both banks and corporates should be transparent and follow international standards. Among further issues, this relates also to the development of local capital markets to reduce dependency on bank intermediation.

- Administrative measures: Such measures like the introduction of credit ceilings are rather harsh and likely create distortions to market functioning. Furthermore, they will be effective most likely only in the short-term, as they are relatively easy to circumvent in the medium- to long term.
- Promotion of better understanding of risks: Here, the regulator needs to be active at different fronts. The banks' ability to monitor, assess and manage risks stemming from excessive credit growth should be strengthened. The public's awareness (i.e. the demand side) regarding the dangers should also be raised. Finally, policies to convince banks to slow down credit growth ("moral suasion") are to mention here.

To sum up, when faced with a credit boom, a multipronged policy response by the authorities along the options shown in Figure 7 seems to be the most promising approach (see Backé et al. (2007)). The right policy mix depends crucially on the concrete macroeconomic policy framework of the country. In countries like Moldova, which are in the transition towards inflation targeting, the macroeconomic instrument toolkit is more flexible than e.g. in countries operating currency boards. Thus, macroeconomic instruments would play an important role in taming credit growth, while supervisory and prudential policies may play supplementary roles.

6. References

- Backé P., Egert B., Walko Z., Credit Growth in Central and Eastern Europe Revisited, Focus on European Economic Integration Q2/07, OeNB, p. 69-78., 2007
- Cottarelli C., Dell’Ariccia G., Vladkova-Hollar I., Early birds, late risers and sleeping beauties: bank credit growth to the private sector in Central and Eastern Europe and in the Balkans, Journal of Banking and Finance, No. 29, 2005
- Coudert V., Pouvelle C., Is credit growth in central and eastern European countries excessive? Banque de France Bulletin Digest, No. 174, July-August 2008
- Duenwald C., Gueorguiev N., Schaechter A., Too much of a good thing? Credit booms in Transition Economies: the cases of Bulgaria, Romania and Ukraine, IMF Working paper WP/05/128, June 2005
- Egert B., Backé P., Zumer T., Credit Growth in Central and Eastern Europe: New (Over)Shooting Stars?, ECB WP Series, No. 687, October 2006
- Hilbers P., Otter-Robe I., Pazarbasioglu C., Johnsen G., Assessing and Managing Rapid Credit Growth and the Role of Supervisory and Prudential Policies, IMF Working paper WP/05/151, 2005.
- IMF, Are credit booms in emerging markets a concern, in: *World Economic Outlook*, April 2004.
- Kiss G., Nagy M., Vonnak B., Credit Growth in Central and Eastern Europe: Convergence or Boom?, Magyar Nemzeti Bank Working paper 2006/10.

Annex

A.1 Data

The sample period is 1995:I – 2010:IV (quarterly data). We used the following variables obtained from the National Bank of Moldova:

- Credit to the private sector ("Claims on non-government sector")
- Corporate loans ("Claims on non-financial corporations")
- Household loans ("Claims on other resident sectors")
- Foreign currency loans ("Claims on non-government sector in foreign currency")
- Domestic currency loans ("Claims on non-government sector in domestic currency")
- Nominal GDP
- Real GDP
- Inflation (CPI)
- Nominal interest rates (Short-term lending rate)

The bank-specific data are based on the "Banking System Survey". Nominal GDP was seasonally adjusted by the authors. One further variable, "GDP-per-capita" (in PPP terms), has been obtained from the IMF's "World Economic Outlook Database". It is available in annual frequency and thus has been interpolated to a quarterly frequency using the pattern of real GDP development.

A.2 Description of the fundamental approach by Kiss et al. (2006)

Kiss et al. (2006) use a two-stage strategy to estimate equilibrium in a number of CEECs. The first stage consist of an estimation for a panel of Eurozone countries, using a pooled mean group (PMG) estimator described by Pesaran, Shin and Smith (1999). Their annual dataset runs from 1980-2002, data have been provided by both Eurostat and the ECB. The following Table 1 shows the estimated coefficients of the long-run relationship.

Table 1

Coefficient estimates (t-statistics in parentheses)

Variable	Coefficients
GDP-per-capita (log)	0.51 (5.36)
Real interest rate	-1.88 (-4.33)
Inflation	-2.04 (-3.93)

Source: Kiss et al. (2006)

The coefficients are in line with what theory would predict, and also similar to other empirical approaches. The coefficient of 0.51 for the GDP-per-capita (in PPP) implies that a 1% increase in GDP-per-capita lifts the credit-GDP ratio by 0.51%, while the real interest rate and inflation have negative effects. The coefficients of the long-run relationship are assumed to be equal for all countries, while the short-run dynamics (not shown) can differ from country to country.

The second stage applies the estimated long-run parameters in Table 1 to CEECs for out-of-sample estimation. While this is straightforward, the selection of a country-specific constant term ("fixed effect") is less so. The constant captures the specifics of a particular country not captured in the explanatory variables, e.g. its institutional set-up. If one has prior beliefs that the country in question shares a similar structure with a member country of the original panel (stage 1), then it is natural to use this particular country constant. However, in the absence of such information, one may try to capture uncertainty by applying a wider number of country constants, e.g. maximum, minimum, and average. Kiss et al. (2006) show in their forecast all Eurozone country constants apart from Luxemburg, which is obviously a special case. The reader has then the freedom to select a relevant benchmark. However, the shadow side of this is a rather wide range of equilibrium estimates, showing significant uncertainty.