Financial Sector Development and Dollarization in the Economies of Central Asia

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Abstract

This study examines financial dollarization in three economies of Central Asia – Kazakhstan, the Kyrgyz Republic and Tajikistan, where dollarization of bank deposits and loans has remained extensive over the recent years. Different factors are suggested to explain financial dollarization in this region. Deposit dollarization has been a result of memories of economic instability reflected in high rates inflation and depreciating local currencies in the 1990s. Moreover, poor governance and institutions quality together with political instability, poverty and foreign exchange inflows constitute a number of factors that contribute to deposit dollarization. Loan dollarization is highly correlated with deposit dollarization. Furthermore, countries with smaller financial systems have higher dollarization levels. Financial dollarization might pose certain risks to financial stability in case of developed and large financial intermediation. Central Asian economies have thin financial systems but increasing bank assets, and thus close monitoring and effective measures to develop local currency instruments and stability are necessary.

JEL classification: G21, P34, F31, E52

Keywords: financial dollarization, deposit dollarization, credit dollarization

1 Introduction and Motivation

The present study focuses on the phenomenon of financial dollarization in a group of economies in Central Asia – Kazakhstan, the Kyrgyz Republic and Tajikistan. In the beginning of transition, there was a very limited use of foreign currency in these countries. Important social and economic transformation had resulted in a deep economic recession accompanied by hyper inflation, considerable depreciation of newly introduced local currencies and overall macroeconomic instability in the region. In such circumstances, loosened restrictions on holding foreign currency encouraged currency substitution and dollarization that offered a hedge against further domestic currency depreciation and decreasing value of monetary and financial assets. Despite economic and financial stabilization from mid-1990s and a rapid recovery from the Russian financial crisis in August 1998, the countries continue to experience significant levels of dollarization. This study contributes to understanding of the factors that drive dollarization of the financial sector in transition economies using examples of the countries in the Central Asia. The importance to study dollarization stems from the fact that high dollarization levels can undermine the effects of the monetary policy. Moreover, financial dollarization contributes to financial instability through an underlying risk of sudden exchange rate depreciations that could result in banking and currency crises.

Financial sectors of the Central Asian economies have lately undergone important developments. Kazakhstan has recently experienced an impressive credit growth and remains the most financially advanced economy in the region. The Kyrgyz Republic and Tajikistan have seen relatively moderate expansion of the financial sector though demonstrating growth in the volume of banking deposits and credit as well. These developments might be fuelled by the restored credibility of the local banking systems and developing financial markets in these countries. Significant shares of deposits and loans denominated in foreign currency held by domestic agents might, however, pose a risk to the stability of financial sectors. Furthermore, relatively underdeveloped and thin financial markets in transition economies might contribute to the vulnerability of the financial system in the face of growing deposit and loan dollarization.

The purpose of the present study is to examine the importance of the financial dollarization, and to detect the major factors that cause banking system dollarization in these countries. Moreover, the study aims at investigating whether there is a relationship between the degree of dollarization and the level of financial development of a given country, and whether high dollarization bears a risk of financial crises. Finally, the study is to discuss financial stability issues and monetary policy effects in the light of financial dollarization, comparing the findings to the other economies' experiences.

Section 2 presents literature on financial dollarization. Section 3 briefly describes economic and financial system developments in Central Asian economies and dollarization in their banking systems. Section 4 provides methodological approach and Section 5 discusses different explanation of financial dollarization. Section 6 discusses financial sector development and financial stability issues in the context of financial dollarization. Section 7 concludes.

2   Literature Review

Currency substitution and dollarization have become an important characteristic of the economic development in most transition and developing economies in the last decade. Authors usually describe dollarization as holding by agents of financial assets denominated in foreign currency or, in other words, a situation when foreign currency substitutes domestic currency as a unit of account and a store of value.[1] Havrylyshyn and Beddies (2003) give to dollarization a broad definition as the use of foreign currency for store of value purposes, as a medium of exchange, and as a unit of account. The authors distinguish two forms of dollarization: currency substitution and asset substitution. The first implies holding foreign currency in cash by domestic agents to conduct various transactions. In other words, if currency substitution is present, foreign currency starts to perform such functions of money as means of payments or unit of account. Dollarization is usually referred to as asset substitution and describes a situation when foreign currency is used as a store of value. In the economies in transition, foreign currency has increasingly been used in all three of the classic functions of money (means of payment, store of value, unit of account), and at present an important share of bank deposits and loans are denominated in foreign currency. This phenomenon is

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[1] See, for example Calvo and Vegh (1992), Balino, Berenzstein and Berg (1999)

known as financial dollarization (FD).[2] It is primarily caused by macroeconomic instability, high inflation, and depreciation of local currency. These factors reduce credibility of the local currency, and economic agents start to use more frequently foreign currency (usually U.S. dollars).[3]

Early literature on dollarization was primarily concerned with currency substitution that emphasized the negative relationship between demand for local currency and inflation rate.[4] In financially dollarized economies however currency substitution can only play a minor role. Recent studies on financial dollarization have provided a number of analytical models that consider dollarization as an asset substitution phenomenon. The literature on financial dollarization has usually distinguished Latin American economies as the most dollarized economies among developing regions. These economies were characterized by extremely high inflation rates during the period of 1980 – 1995. The process of dollarization in Latin America accelerated after the external debt crisis, when the countries experienced recession, growing inflation and unemployment. Overall macroeconomic instability led to capital flight and an increased use of U.S. dollars alongside national currencies by the end of 1980s. In the last decade, the level of dollarization and, in particular, financial dollarization, in these economies continued to grow. Rennhack and Nozaki (2006) show that financial dollarization increased in most developing country regions between the mid-1990s and early 2000s. In such circumstances, some governments have decided to adopt full dollarization seeking for more policy credibility. For example, Ecuador dollarized officially in September 2000. This policy has helped to reduce inflation and inflation expectations, and to stabilize this economy. The level of financial dollarization has also increased in the economies with low initial dollarization (e.g. Costa Rica, Paraguay). Some economies have managed to avoid significant dollarization even though they experienced severe macroeconomic problems as

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[2] De Nicolo, Honohan, and Ize (2003) distinguish among three generic types of dollarization that broadly match the three functions of money: payments dollarization (also known in the literature as currency substitution), is residents' use for transaction purposes, of foreign currency, in cash, demand deposits, or central bank reserves; financial dollarization (also referred to as asset substitution) consists of residents' holdings of financial assets or liabilities in foreign currency; real dollarization is the indexing, formally or de facto, of local prices and wages to the dollar. In turn, financial dollarization may be domestic (i.e. associated to claims of residents, including against the government), or external (i.e. associated with the claims of non residents against residents)
[3] see Havrylyshyn, Beddies (2003)
[4] See, for example, Giovannini, Turtelboom (1992), and Thomas (1985)

well.[5] Since 2001, financial dollarization has declined in some Latin American countries. For example, in Argentina the government forced its residents to convert into national currency, reducing the degree of dollarization in this economy. Nevertheless, high levels of dollarization persist in this region even after significant macroeconomic stability reflecting the historical legacy of high inflation episodes, national currency depreciation by over 1000 percent and lending interest rates of more than 100 percent.[6] The countries in Latin America have learned to accommodate the risks related to high dollarization levels and have seen the advantages of dollarization, such as deeper financial integration with the international financial markets and thus a rapid development of national financial systems.

The experience of Latin America cannot be overestimated when making comparison to transition economies. The economic developments in transition economies in the 1990s and the beginning of 2000s are very similar to those experienced by Latin American countries earlier. As Rennhack and Nozaki (2006) show, the use of foreign currency has grown most rapidly in transition economies in the last decade as a consequence of general macroeconomic instability. At present transition economies in Central Asia experience rapid growth of their financial sectors, and become more open for international finance. Higher financial dollarization is on one hand a result of such developments, and, on the other hand, it can promote further dollarization of their financial systems. Several authors discuss the role of financial dollarization in promoting financial system development and in causing financial instability. The study by de Nicolo, Honohan and Ize (2003) belongs to that stream of literature on financial dollarization. The authors examine dollarization of the banking system in a sample of 100 countries. The main questions articulated by this study are to determine the factors driving financial dollarization, to examine the relationship between financial deepening and dollarization, and to find out whether dollarization brings financial instability. The authors could establish that the main driving forces of financial dollarization are the risk environment and the calculated minimum variance portfolio. The MVP dollarization calculated from historic variances and covariances of inflation and real exchange rate changes captures the risk environment, and the institutional variables in the study are represented by

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[5] Rennhack and Nozaki (2006) make an example of Brazil, Chile, Colombia, Mexico and Venezuela as countries that preserved demand for their currencies through a combination of sound economic policies, indexed financial instruments, and legal restrictions on dollarized transactions.
[6] See Rennhack and Nozaki (2006)

the administrative restrictions in a given country, measures of political and institutional development, and measures of legal protection of creditors. The authors further extend the study by Honohan and Shi (2003) and find that dollarization can promote a deeper domestic financial system. This result is however true only in the case of inflationary economies. The question whether dollarized economies are more fragile is supported by the examples of the Mexican 1982 crisis and the crisis in Argentina in 2002. The authors argue that domestic dollarization affects the stability of financial systems, as dollarized systems are more exposed to solvency and liquidity risks.

Levy Yeyati (2006) provides a comprehensive study on financial dollarization through studying the determinants of financial dollarization, and whether empirical effects of FD on financial stability and economic performance are consistent with theoretical predictions. The author emphasizes the role of balance sheet effects that accompany financial dollarization and introduce a currency imbalance for the economy as a whole. The author presents a theoretical background for studying dollarization and FD in particular, and classifies the literature on asset substation by different groups of explanations:

- *a portfolio view* that explains FD as the optimal portfolio choice for a given distribution of real returns in each currency (see also Ize and Levy Yeyati, 2003); this approach explains dollarization as investors choice to minimize the variance of portfolio returns, which depends on the volatility of the inflation and the real depreciation rates.

- *a market failure view* that explains FD as a response to a market imperfection; this explanation of FD suggests that a dollarization bias relates to presence of market imperfections and externalities, and an inadequate regulatory framework that fails to address them.

- *an institutional view* that explain increasing FD as a consequence of institutional failures.

The author finds out that portfolio and institutional view explain rather well the cross-country variation in the share of dollar denominated deposits. Therefore, volatility of inflation and exchange rate together with poor institutional quality can foster financial dollarization. Moreover, the author examines the link between FD and crisis propensity due to the presence of balance sheet effects. Results show that the exchange rate devaluation and FD increase crisis propensity.

Barajas and Morales (2003) emphasize the fact that liability dollarization contributes to currency and financial crises by exposing the balance sheet of both the public and private sectors to large swings in the exchange rate. These authors make a somewhat similar to Levy Yeyati's (2006) classification of explanations for FD. They distinguish three major reasons of liability dollarization in emerging market economies: financial development, macro-related and banking-related explanations.

In the study of the IMF (2006) on the financial dollarization in Ukraine, presence of foreign banks is discussed as a factor to contribute to banking sector dollarization. Dabla-Norris and Floerkemeier (2006) study dollarization in Armenia, and argue that important growth in remittances inflow might contribute to financial dollarization as well. This factor should be important in explaining dollarization the economies in Central Asia, as they have lately experienced significant increase in remittances from abroad.[7]

Many authors suggest the ratio of deposits denominated in foreign currency to total deposits as a measure of dollarization level. The justification of such a choice is based on several reasons. First of all, there is a limited availability of data on dollarization for most developing and transition countries. For example, it is very often impossible to find data on foreign currency in circulation in those economies. Therefore, the DI usually represents a measure of overall level of dollarization. Different measures of dollarization were considered by Feige (2003) who distinguishes between currency substitution index (CSI) and asset substitution index (ASI), where the former constitutes a ratio of foreign currency in circulation to total currency supply, and the latter is a ratio of foreign currency deposits to a sum of total demand and time deposits. The author studies the relationship between the two measures considering both simple correlation and inter-temporal correlation. He concludes that the relationship between these two phenomena is quite complex and varies across countries. And thus, it is to some extent questionable to use a share of foreign deposits as a measure of dollarization in general.

The authors who study financial dollarization in particular, consider deposit ratio as a major measure of financial dollarization while accepting its shortcomings. De Nicolo et al. (2003) discuss that such a measure includes demand deposits which in fact reflect payment

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[7] Tajikistan is in fact the second country among former USSR economies by the share of remittances to GDP, with Moldova being the first (IMF Country Report, Tajikistan, 2007)

dollarization (or currency substitution), and it fails to include dollar cash and offshore deposits, and it ignores nonbank holdings of financial instruments, such as government securities, shares in mutual funds, pensions and insurance claims, and all derivative instruments. These shortcomings could, however, play a less important role in the countries in Central Asia due to several factors related to the countries' economic background and financial sector developments. The offshore foreign currency deposits constitute probably a tiny part of overall foreign currency holdings for these economies. Moreover, financial markets do not offer economic agents a big variety of financial instruments. Hence, deposits and credit denominated in foreign currency constitute major financial assets and liabilities of the banking systems in the region, and foreign currency deposits represent major financial instrument for the private sector. Levy Yeyati (2006) argues that deposit dollarization ratio can be used as a sensible proxy for domestic loan dollarization since they mirror each other due to the presence of prudential limits on banks' foreign exchange positions. In the present study I distinguish between deposit and loan dollarization which can be explained by different factors.

3   Developments and dollarization in financial sectors in Central Asia

The dissolution of the Soviet Union in the beginning of 1990s led to a deep socio-economic crisis in the economies of Central Asia: a severe output decline, general macroeconomic instability, and hyperinflation (see Figure 1). Recent macroeconomic stabilization has not significantly affected the level of dollarization though there is a tendency to decline in Kazakhstan. Financial sectors of Central Asian economies have undergone important developments since the countries had started building market economies. Emerging second tier banks first served some big industrial and trade enterprises' needs and later also started to provide financial services to households and developing small and medium businesses. They had become an important stage in development of local financial markets. It is however important to note that until today financial sectors are mainly represented by the banking institutions. Other types of financial intermediaries are still rudimentary and small and occupy a very tiny share of the financial markets. Banking assets constitute the major part of the financial assets in Central Asian economies.

Figure 1. Inflation in Central Asia
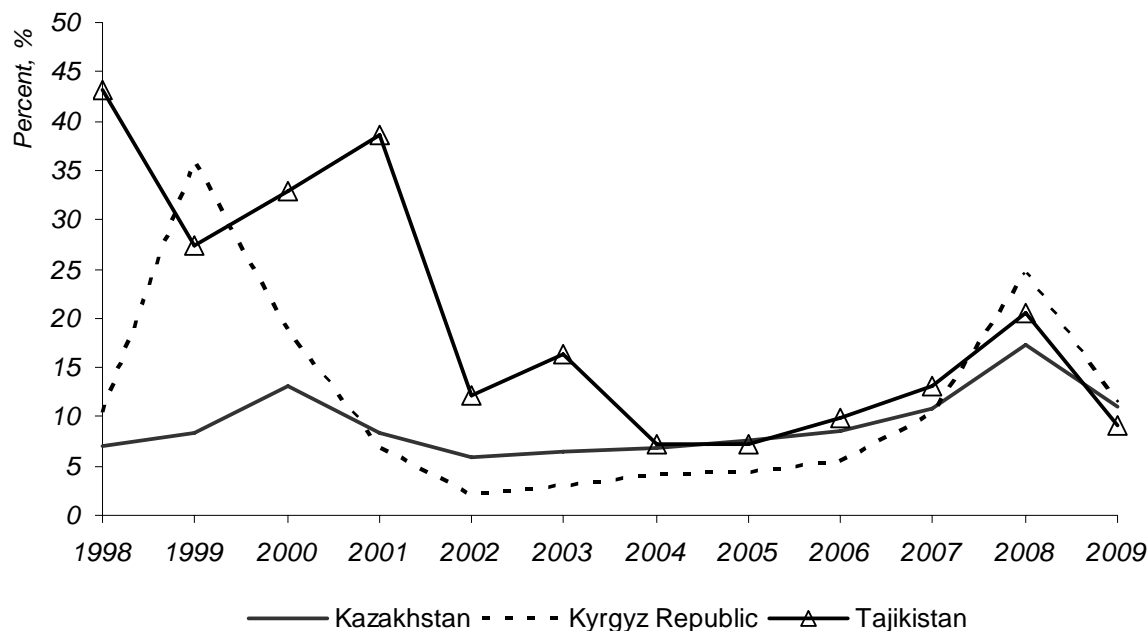
Notes: Data for 2008 are estimates, data for 2009 - projections
Source: EBRD Transition Report, 2008

Table 1 on selected financial indicators provides evidence that the size of financial systems represented by banking sectors in Central Asian countries is still not important in comparison to financial systems in Central and Eastern Europe. The data in the Table 3 comprises information for 2005 -2006, and there have been important advances recently in the Central Asian economies. In relative terms, however, financial intermediation still lags behind in these countries when compared to more advanced economies in Central and Eastern Europe (CEE). The degree of monetization in the economies of Central Asia is still lower than that in more advanced transition countries. The size of the banking systems measured as the ratio of bank assets to GDP is smaller in these economies than in CEE, including the Baltic countries. Other indicators, such as bank deposits to GDP and bank credit to the private sector, show that financial intermediation is still low and banks do not constitute an important source of financing of real activity.

Table 1 Selected Financial Sector Indicators

	M2/GDP	Bank assets/GDP	Bank deposits/GDP	Bank credit to private sector
Kazakhstan	26.6	63.3	25.6	26.7
Kyrgyz Rep.	21.3	51.3	9.2	6.2
Tajikistan	7.0	20.7	8.9	12.9
Armenia	16.4	20.2	10.7	8.2
Azerbaijan	18.0	26.8	12.7	9.1
Estonia	29.5	112.6	44.8	60.0
Latvia	23.1	123.2	36.7	60.1
Czech Rep.	69.8[*]	99[***]	56[***]	36[**]
Hungary	49.9[*]	80[***]	34[***]	50[**]
Poland	44[*]	61[***]	34[***]	29[**]

Notes. Figures are taken from Dabla-Norris and Floerkemeier (2006) with data for 2005 if not specified otherwise.
Other sources:
*   IFS, World Bank Financial Indicators
** EBRD Transition Report 2007 (data for 2005)
*** National Banks

Dollarization of bank assets and liabilities has been a widespread phenomenon in the economies of Central Asia. It is important to take into account as dollarization might affect the stability and development of the financial system. A standard measure of dollarization – dollarization index (DI) – for all three economies is represented in Figure 2 from which it is evident that dollarization has had an important magnitude in all three economies. The dynamics and trends in dollarization indices have however differed from country to country. For example, dollarization index has decreased in Kazakhstan since 2001, while in Tajikistan it has been growing steadily until 2006-2007, and remained at a very high level. There was a sharp decline in dollarization in 2008 in Tajikistan related to weakening of the position of the U.S. dollar in the global markets and due to decreasing nominal value of the foreign currency deposits share in total deposits.

Figure 1 Dollarization Indices in Central Asia
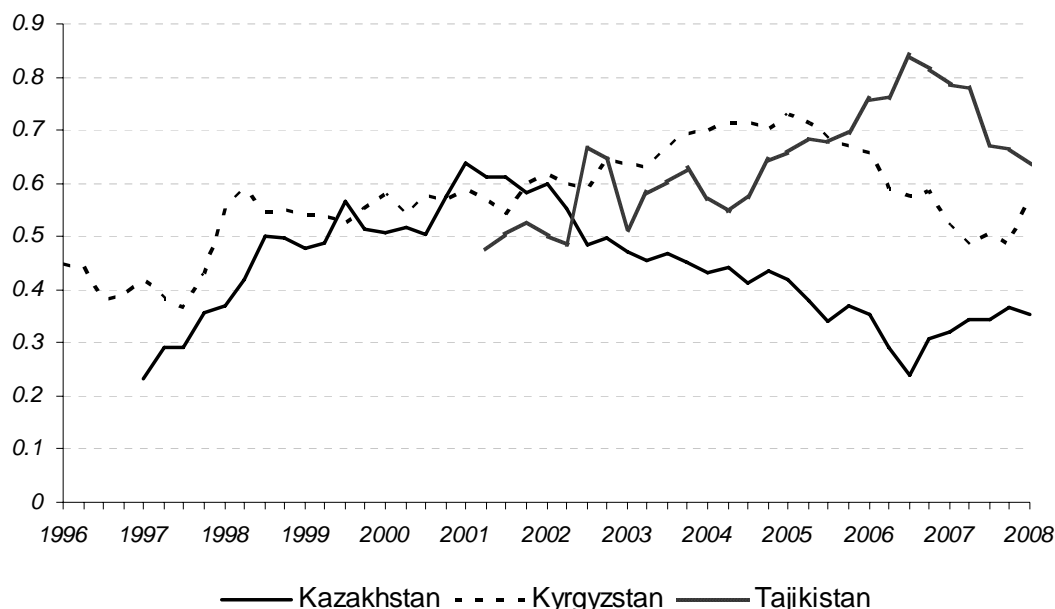
Source: National Banks

Note: Dollarization Index is computed as a ratio of foreign currency denominated deposits to total deposits

Figure 2 (a) shows deposit and loan dollarization in 2002 and 2008 for the three economies. Both indices have decreased in Kazakhstan where liability dollarization was around 35 per cent and loan dollarization was 44 per cent in 2008. In the Kyrgyz Republic, though deposit dollarization has declined, it remained 58 per cent, and loan dollarization has increased to more than 65 per cent. In Tajikistan, amount of deposit denominated in dollars has increased to a very high level of 64 per cent while loan dollarization has decreased to 53 per cent of total loans. If compared to other transition economies, Central Asia appears to be among the countries with the highest levels of financial dollarization.[8]

Among factors that caused dollarization are macroeconomic instability of the 1990s, depreciation of the local currencies, and high inflation rates. Buying dollars and keeping them was an efficient way to save money in countries with rudimentary financial systems and absence of saving instruments.

Macroeconomic stabilization and developments in the financial systems have brought certain credibility to national currencies and banks. Persistent dollarization could be explained

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[8] See IMF (2006) for financial dollarization in a group of transition economies.

Figure 2. Financial Dollarization in Central Asia (in percent)

a) Deposit dollarization

a) Loan dollarization
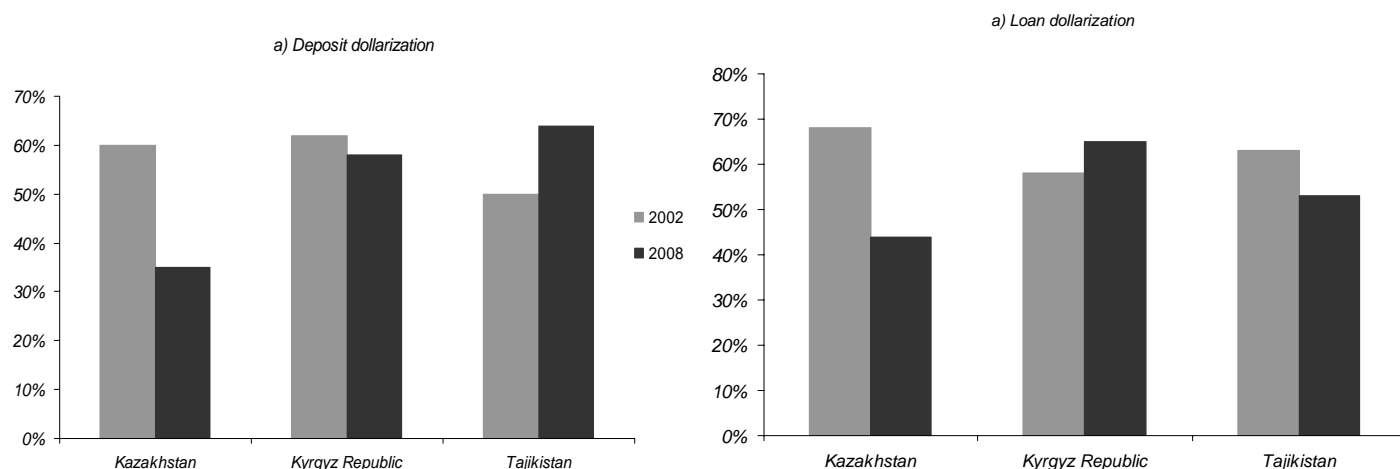
Source: National banks

by lingering memories of high inflation or a persistent fear of recurrence. The evidence suggests that for most transition countries, dollarization does not decline significantly over time following periods of high inflation.[9]

Several sources of foreign cash and foreign capital inflows should be mentioned. First, increasing dollarization levels are related to the increasing inflows of foreign capital and foreign exchange in these economies. For example, remittances have become an important source of foreign exchange and finance for local economies (see Table 2).

Furthermore, a lack of confidence in the quality of institutions of economic management can undermine confidence in the domestic currency and provide an incentive to hold assets in foreign currency.

An important factor of financial dollarization might be foreign participation in the banking systems of the countries in Central Asia. In the Kyrgyz Republic, for example, 14 out of 21 operating banks have foreign participation, with 10 banks having more than 50 % of foreign participation in their capital. There are 3 foreign banks in Tajikistan. In Kazakhstan, however, foreign participation has decreased over the recent period, and the share of banks

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[9] IMF Selected Issues, Ukraine, 2006

assets with foreign participation in the authorized stock capital in total bank assets was 17.6 % in 2008.[10]

Table 2. Capital Inflows in Central Asian Economies

	2003	**2004**	**2005**	**2006**	**2007**	**2008**
Remittances*(mln.USD)%						
Kazakhstan	147	166	178	187	223	192
Kyrgyz Republic	78	189	322	481	715	1232
Tajikistan	146	252	467	1019	1691	2544
FDI(mln.USD)%**						
Kazakhstan⌐	2213	5436	2123	6630	6900	10732
Kyrgyz Republic	46	132	43	182	208	265
Tajikistan	32	272	55	66	160	190

Source: *World Bank Migration and Remittances Factbook, 2008.
        Data retrieved from the website of the WorldBank.
    **EBRD Transition Report, 2008.
        Notes: Data for FDI in 2008 are estimates.

4   Methodology

Two sides of financial dollarization (FD) are examined in the study: dollarization of deposits and loans. Due to a short time span, different concepts of financial dollarization will be studied in the framework of simple statistical correlation. The following explanations of dollarization of financial sectors are suggested:

1) The *currency substitution* view can be captured by the past values of inflation;

2) The *minimum-variance portfolio (MVP)* view (or banking related view) is tested through measuring the MVP as follows

   $MVP = [Var(\pi) + Cov (\pi,s)]/[Var(\pi)+Var(s)+2Cov(\pi,s)],$

   where π – stands for inflation rate and s is a change in the real exchange rate;[11]

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[10] Data on foreign participation in the second tier banks is taken from the sites of the national banks: National Bank of Kazakhstan, National Bank of the Kyrgyz Republic and National Bank of Tajikistan

[11] The MVP variable cannot be included in the regression due to the short time span and a small country sample. However, a dollarization level based on MVP can be calculated and compared to actual level of dollarization in the economies of Central Asia.

3) The *financial development* explanation is captured by interest rate spreads where relative interest rates on deposits and loans in foreign and domestic currency are used.

And approaches that will be used if appropriate indicators of a relevant time span and frequency are available:

4) The *institutional view* that can be captured by the initial GDP per capita, a variable that measures the degree of legal restrictions on dollarization, and several other institutional variables that might affect dollarization.[12]

5) Loan dollarization, following Luca and Petrova (2008) is explained by the openness of a given economy, interest rate spreads and dollarization of deposits.

To study relationship between financial sector development, financial stability and dollarization, the same methodology is used. The data in the graphs is the end of 2008. The more recent observations were included to avoid the effect of the international financial turmoil.

5 What Causes Financial Dollarisation in Central Asia?

5.1 Deposit Dollarization

5.1.1 Currency Substitution View

Currency substitution view relates dollarisation to high rates of inflation in the past. Below are three charts that capture developments of inflation and deposit dollarisation in the three countries since 1996. As literature on dollarisation suggests, high inflation leads to currency substitution and financial dollarisation because residents seek to protect their purchasing power and value of financial or monetary assets.

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[12] Levy Yeyati (2006) uses a composite index that averages six governance indicators compiled by Kaufmann *et al.* (1999), where large values indicate greater institutional development, with the caveat that the indicators are computed only since 1996. Alternatively, he uses the Country Policy and Institutional Assessment assembled by the World Bank

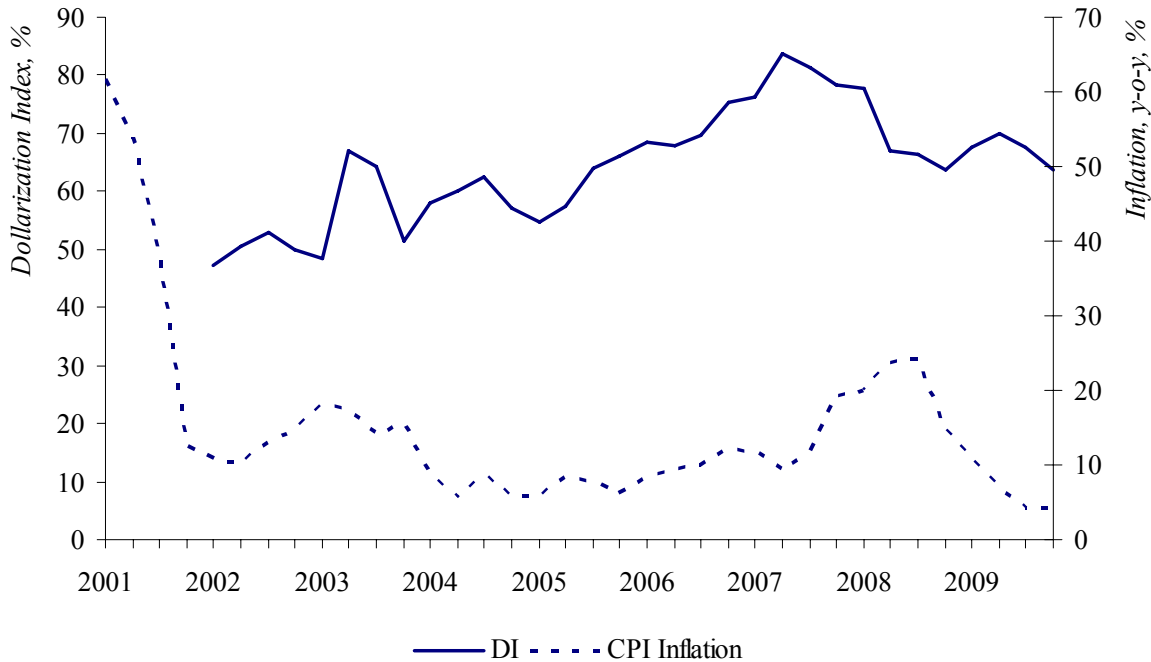**Figure 4. Dollarization and inflation in Central Asia**

a) Kazakhstan
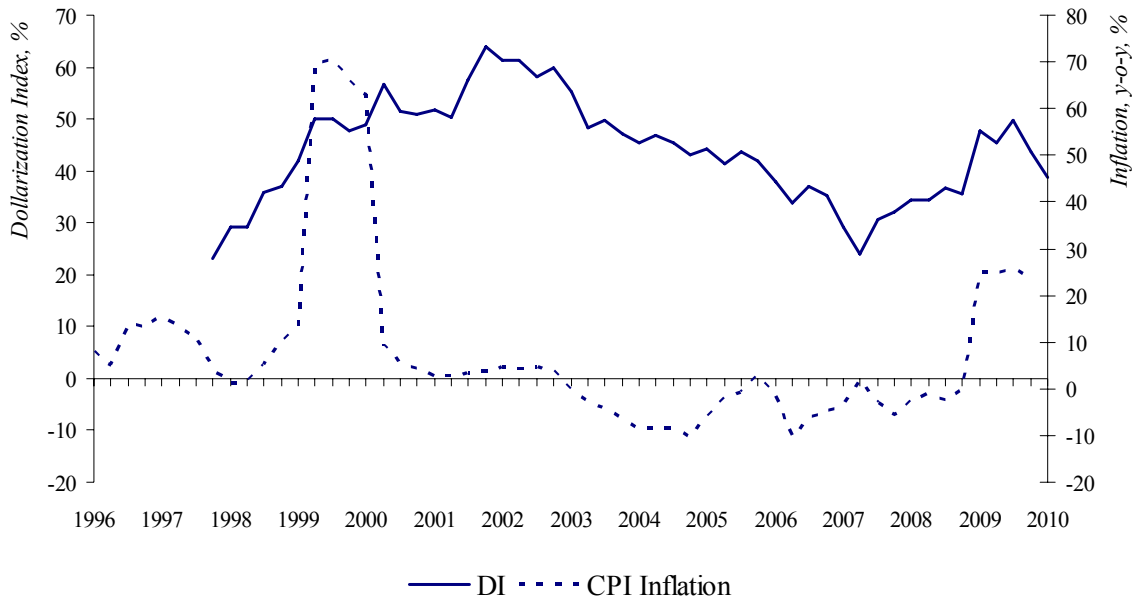
b) Kyrgyz Republic
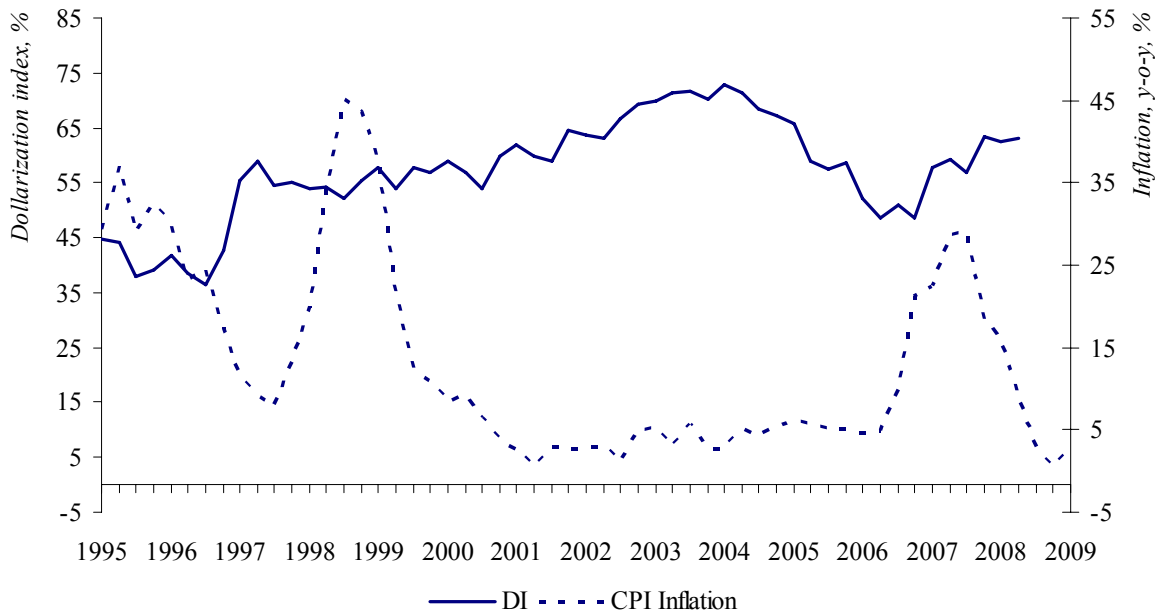
c) Tajikistan

It is clear from the graphs that deposit dollarisation is related to high rates of inflation and therefore depreciation of the local currencies. Dollarization in Kazakhstan has been rapidly increasing from 10 per cent in 1996 to 50 per cent in 2001 when it started to decline gradually over the whole period till 2007. There was a sharp increase in 1999 which can be related to the depreciation of the local currency – the Kazakh tenge – as a result of the Russian financial crisis. Moreover, overall increase in the deposit can be related to the growing credit of the public to the local banking system as well as growing income of the oil sector. Increasing oil export revenues required, denominated in the U.S. dollar, were reflected on the deposit accounts of the exporting firms. Therefore, both increasing volume of deposits and growing export sector can be the reasons for the gradual increase in the deposit dollarization in Kazakhstan till 2001. The reason for decreasing share of dollar denominated deposits in total deposit relates to the stronger position of the local currency and gradual tendency of de-dollarization. Similar situation was observed in the economy of Russia.

Dollarization started however to decline after 2002 as Kazakh money appreciated versus U.S. dollar. This could be a sign of growing confidence in local currency but also an effect of depreciating foreign currency assets if expressed in units of local currency.

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Dollarization in the Kyrgyz Republic has remained stable at around 20 per cent during the period of 1998 until 2003. It has increased more than twice from 2003 to 2005 and then dropped in 2006. The Kyrgyz Republic has experienced modest developments in the banking sector in comparison to Kazakhstan. Moreover, there seems to be little improvement in the public's confidence toward local banks. Only 5 per cent of population had a bank account in 2008. A sharp increase in dollarization level can be explained by a sharp increase in remittances inflows from 2003 to 2005 when the latter grew almost 4 times. First, a part of the remittances could come through the banking system and remain on the bank accounts of the residents who opened bank account for a purpose of receiving money transfers. Second, money transfers from abroad are usually denominated in foreign currencies and, in particular, in U.S. dollar. A decrease in the dollarization index shown in the graph might be related to the fact that U.S. has significantly depreciated vis-à-vis the local currency in 2007 – the Kyrgyz som.

Dollarization of deposits in Tajikistan is the highest among the economies of Central Asia with the highest peak of around 70 per cent in 2006. There is no data available on deposits for Tajikistan before 2001. It is evident however that dollarization has been rapidly increasing over the whole period from 2001 to 2008. One of the major factors driving dollarization of deposits appears to be considerable inflows of remittances. Tajikistan is a leading economy (after Moldova) by the size of incoming money transfers from labor migrants. The country is landlocked and isolated by high mountain ranges and has a poor transport infrastructure and communication to other countries. In these circumstances sending money through money transfer systems or banks seems to be a convenient and inexpensive way to make such transfers.

5.1.2 Minimum Variance Portfolio

The minimum variance portfolio (MVP) approach to examine financial dollarization was proposed by Ize and Levy Yeyati (1998). In their study, the authors present a portfolio model of financial intermediation in which currency choices are determined by hedging decisions on both sides of the banks' balance sheets. They find that the MVP approach provides a natural benchmark to estimate dollarization of bank deposits and loans as a function of macroeconomic uncertainty. The authors' findings provide evidence to ability of

the MVP dollarization to approximate actual dollarization closely for a broad sample of countries. Levy Yeyati (2006) provides a very detailed description of the MVP theory and computations. The following equation is usually used by the authors to compute the MVP:

$$MVP \equiv (var(\pi) + cov(\pi, s))/(var(\pi) + var(s) + 2cov(\pi, s)),$$

where π is inflation rate, and s is real depreciation. The computation can be simplified to the following equation:

$$MVP = var(\pi)/cov(\pi, e),$$

or a coefficient of simple regression of the inflation rate on the nominal depreciation rate. Following this definition of the minimum variance portfolio, the underlying MVP dollarization is calculated for the three economies and the results are presented in Figure 5.

The actual dollarization level was calculated as a simple arithmetic average of dollarization indices over the period of 1995 to 2008. The sample was divided into two periods: 1995 – 2000 and 2000 - 2008. Comparison is provided for the three samples. The MVP approach underestimates dollarization in the economies of Central Asia. The most accurate predictions of the MVP theory are for the period of 1995 to 2000. The largest gap between the actual dollarization index and the predicted one is for the recent period starting in 2000. The MVP theory predicts composition of the portfolio on the basis of volatility of inflation and the exchange rate. It is evident that both have become much more stable in the second half of the sample. Therefore, MVP predict a low level of dollarization. Actual data shows however that dollarization index has recently increased and stayed at high levels even after prices and exchange rates stabilized. This supports the idea that dollarization is highly persistent in this region. The study by IMF (2006) for Ukraine has shown the same results, i.e. MVP usually underpredicted the actual level of dollarization. The authors explain that higher actual levels of deposit dollarization might be explained by some other factors than MVP. For example, important amount of remittances could be the reason for difference between actual and underlying MVP dollarization.

**Figure 5. Actual and minimum variance portfolio dollarization in Central Asia**

a) 1995 – 2008

b) 1995-2000   *c) 2000-2008*
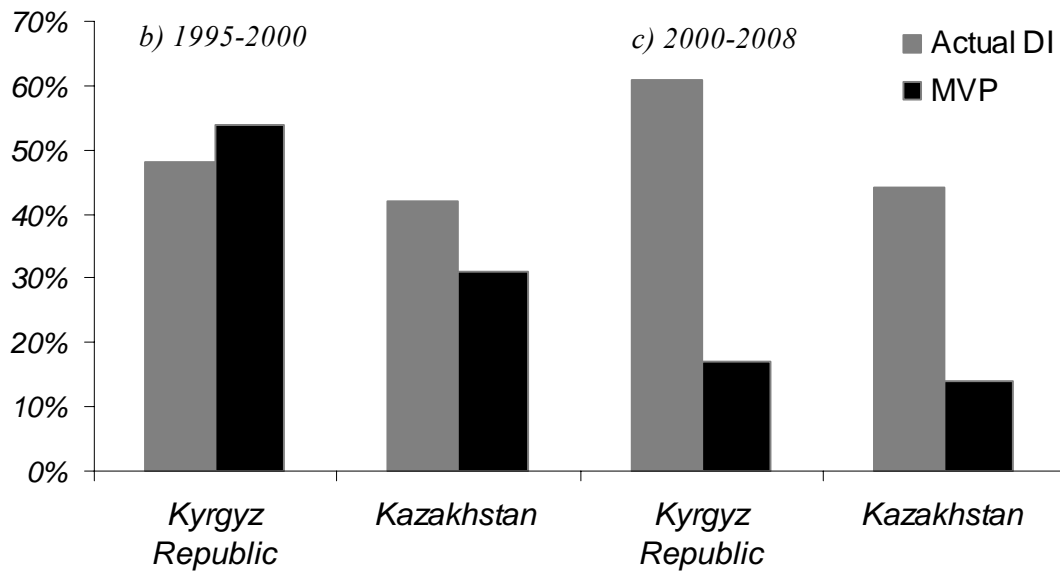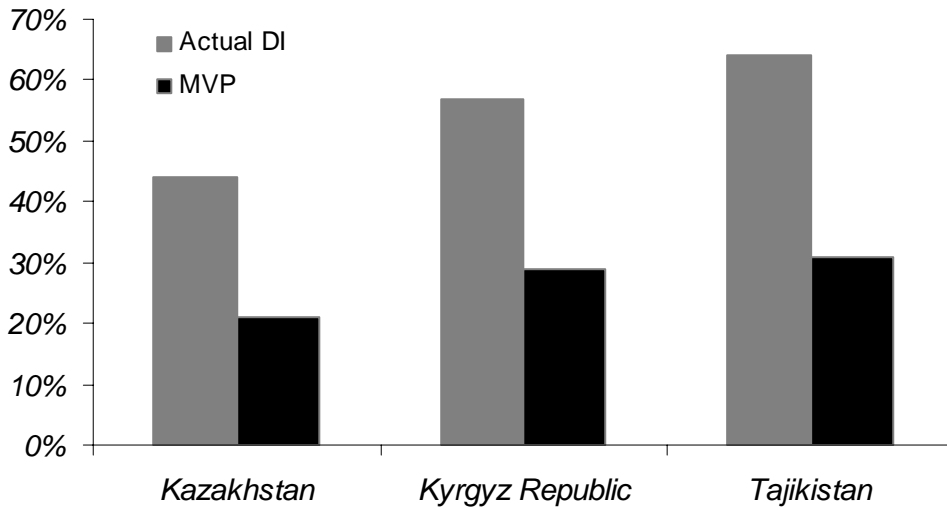
5.1.3 Financial sector development view

A possible explanation for high levels of dollarisation in the banking systems of Central Asian economies is development of financial sectors. In these countries thin financial systems, absence of savings and financial instruments makes people keep their monetary savings in foreign currency. U.S. dollars become an equivalent to a saving instrument and a way to hedge against inflation and depreciation of local currencies. The next chart represents relationship between the size of a banking system and level of dollarisation. The banking system size is measured as a share of total assets of commercial banks to GDP and is a proxy for development of financial systems. The evidence is that countries with larger banking systems have a lower degree of dollarisation, while countries with smaller banking systems tend to be the most dollarized.

Figure 6. Financial sector development and dollarization
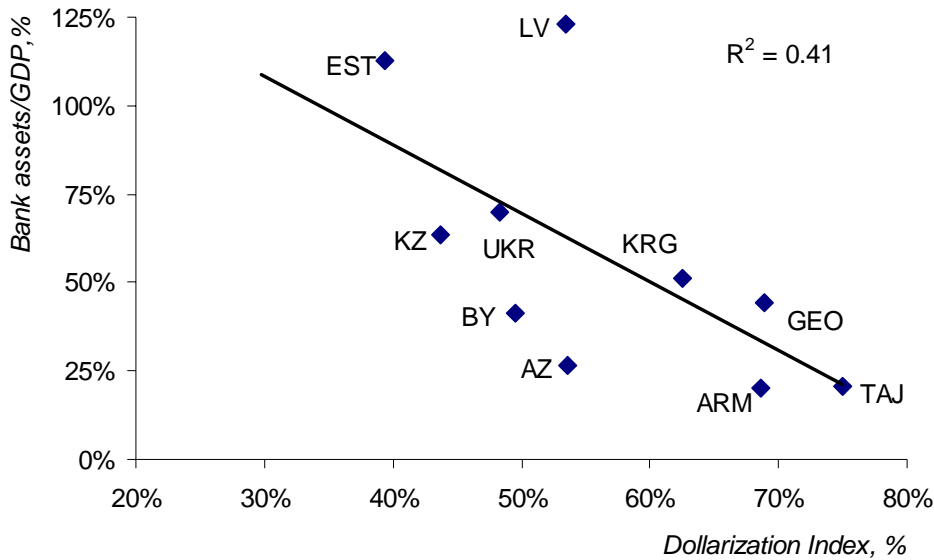
Source: CEIC, National banks, IMF

5.1.5   Institutional development view

Quality and development of institutions and political stability can be an important factor to reflect confidence of residents toward local currencies and efficiency of national policies. Figure 7 represents a scattered graph that reflects correlation between quality of governance and dollarisation in a group of countries which are former Soviet Union republics. The evidence is that the lower is the quality of governance the higher is dollarisation level with the Kyrgyz Republic and Tajikistan being placed in the lower RHS corner of the chart.

The quality of governance reflects overall credibility of economic policies in the country and effectiveness of policy making institutions. Low credibility results in lower confidence toward local financial systems and local currencies.

Figure 7. Governance and dollarization
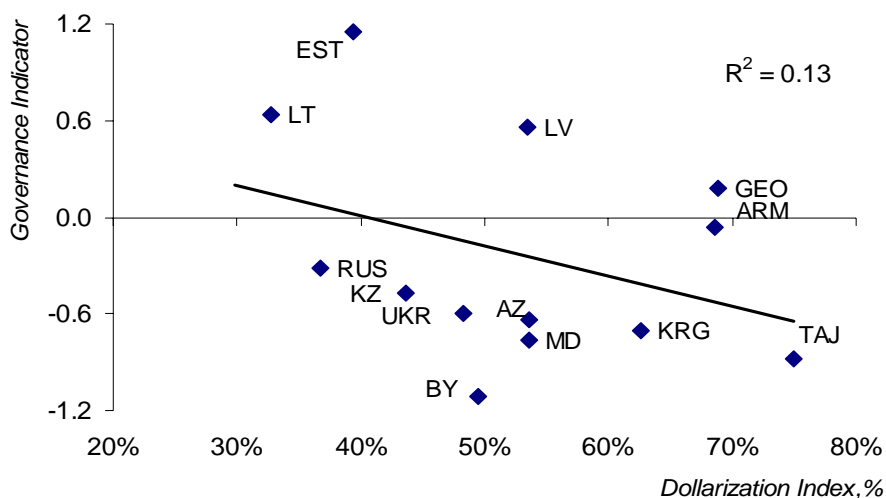
Source: WB Governance Indicators, CEIC, national banks

I also present a chart with correlation between political stability and dollarisation of bank deposits. It is clear that political stability is an important factor of confidence towards macroeconomic policies and stability in this group of countries. There is again an evident negative correlation between the two indicators. The less political stability is there in a country, the lower is confidence toward local currency.

Figure 8. Political stability and dollarization
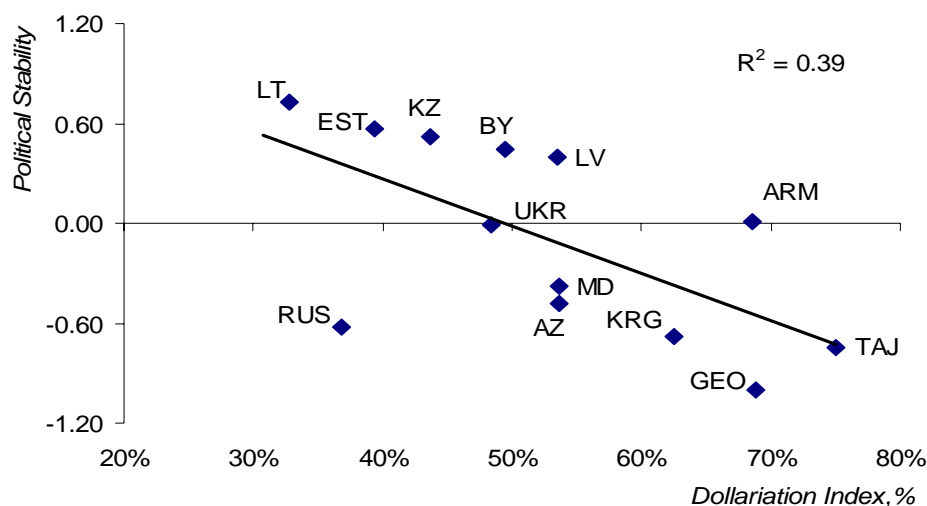
Source: WB Governance Indicators, CEIC, national banks

Poverty and remittances appear to be another determinant of high dollarisation in Central Asia. Tajikistan and the Kyrgyz Republic appear to be the poorest economies among former USSR countries if compared by GDP per capita. Tajikistan has the highest share of remittance to GDP which was 49.5 per cent in 2008 according to World Bank estimates of remittances inflows. Poor standards of living or low per capita income reflects overall economic situation in a given country, i.e. developments of various institutions, financial developments and social safety of the population, poor access to financial services. This can explain the willingness of residents in poor countries to opt for foreign currency holdings rather than local currency. Figure 9 shows that Tajikistan and the Kyrgyz Republic are among countries with the lowest income but with the highest level of dollarization.

Figure 9. Income and dollarization
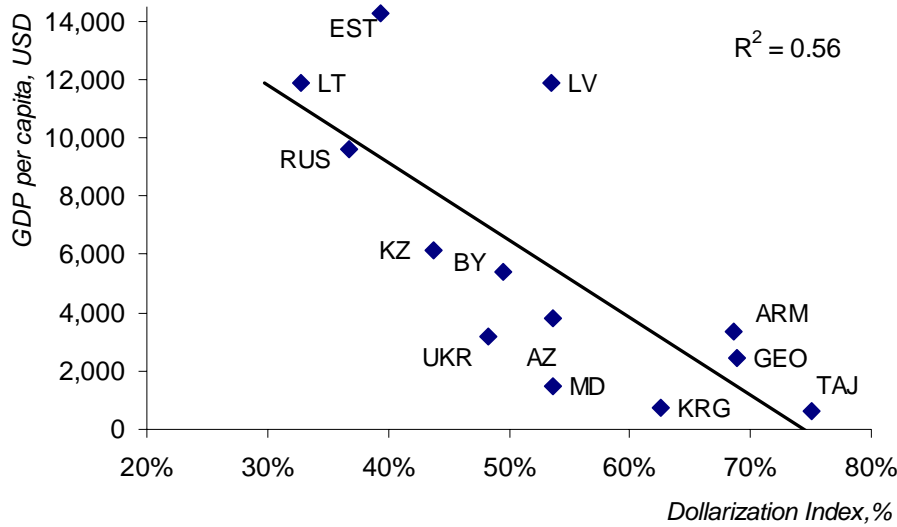
Source: WDI, CEIC, national banks

Remittances inflow appears to be correlated to high levels of dollarization. That might be related to the fact that remittances are actually transferred through banking systems and might stay on deposit accounts of residents which is a case in Tajikistan, for example. Remittances or a larger part of remittances inflows is denominated in U.S. dollars.

**Figure 10. Remittances and dollarization**
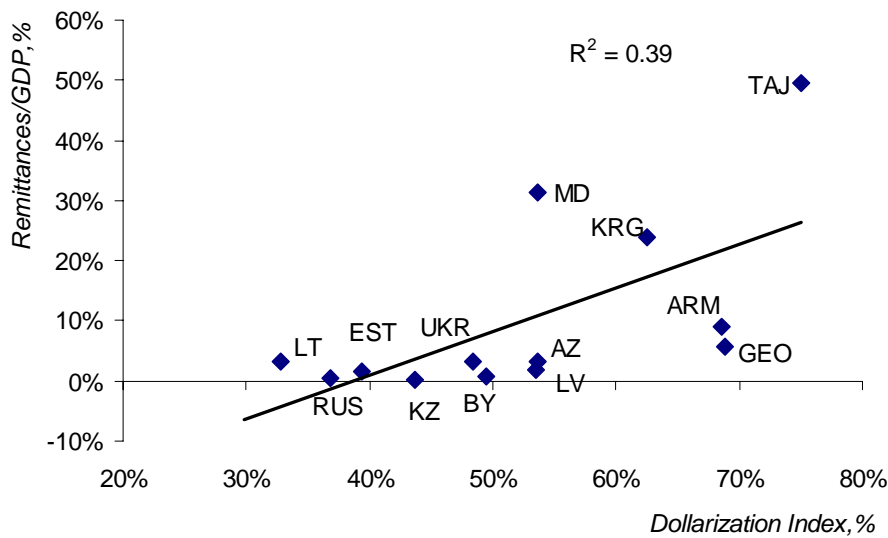
Source: World Bank, CEIC, National banks

5.2 Loan Dollarization

Luca and Petrova (2008) study credit dollarization and base their model on the minimum variance portfolio model, where domestic agents make choices following the MVP allocation. The difference is that the authors assume that banks are risk averse and therefore, currency matching becomes an important determinant of credit dollarization. The authors base their model on the several studies that examine factors of currency composition of banks' and firms' portfolio allocations. Following this literature, credit dollarization is represented as a function of a group of variables: bank variables, firm variables and controls. The authors motivate the choice of variables by the following reasoning. Banks with highly dollarized deposits lend to domestic firms in dollars in order to avoid currency mismatched portfolios. Exporting firms tend to borrow more in foreign currency. Therefore, I consider openness of the economy measured by the ratio of the external trade turnover to GDP and deposit dollarization as possible explanations to loan dollarization. Also interest rate spreads on lending in local and foreign currency might affect borrowers decision to choose foreign currency denominated loans.

Exporting firms will naturally borrow or deposit in foreign currencies as they make payments or receive payments in foreign currency. Therefore, degree of openness of an economy should affect dollarisation of borrowers. Figure 11 shows correlation between importance of foreign trade and dollarisation. Importance of external trade is measured as a share of total external trade turnover to GDP and proxies the degree of openness of a given economy. The chart provides evidence on the positive correlation between external trade and dollarisation. This is however particularly true of Baltic countries but not Central Asian economies. The latter seem to be less integrated into external commercial relations while still having an important degree of exposure to foreign currency borrowing.

Figure 11. External trade and dollarization
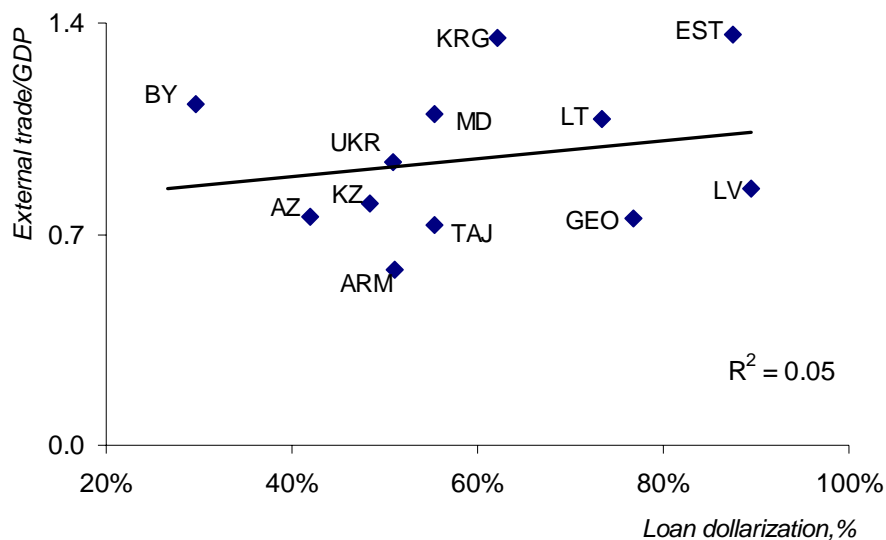
Source: CEIC, national bank, WEO April 2010

Spreads between interest rates on loans denominated in foreign and local currency is another factor that determines the choice of borrowers to take loans denominated in foreign currency. Commercial banks in transition economies tend to set higher interest rates for loans denominated in local currency to hedge the value of their assets against local currency depreciation. This however does not eliminate the credit risk as the latter now transferred on firms and households who often appear to be unhedged too. The reason residents opt for foreign currency loan is lower interest rates to be paid on those. In Central Asian economies, banks set much higher interest rates on local currency loans as well. This might partially explain loan dollarization of the local banking systems (see Figure 12).

Figure 12. Interest rate spreads and dollarization
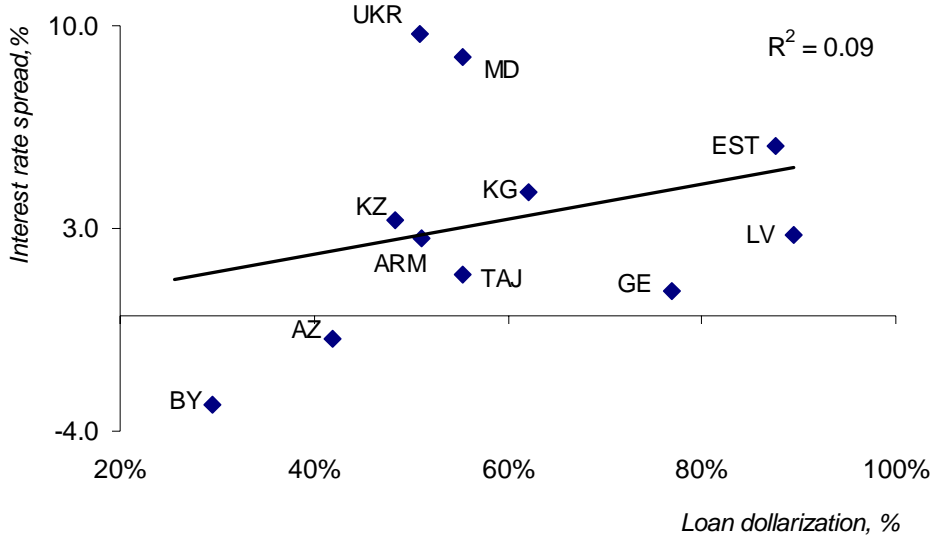
Source: CEIC, National Banks

Since residents often prefer to hold deposits in foreign currency, banks might find it reasonable to lend in foreign currency too to cover their open currency positions. There is a clear positive correlation between loan and deposit dollarization established in Figure 13. In Kazakhstan in the end of 2008, deposit and loan dollarization were around 48 per cent and 44 per cent respectively. In the Kyrgyz Republic, these indices stood at 62 per cent and 63 per cent, while in Tajikistan – at 53 per cent and 64 per cent.
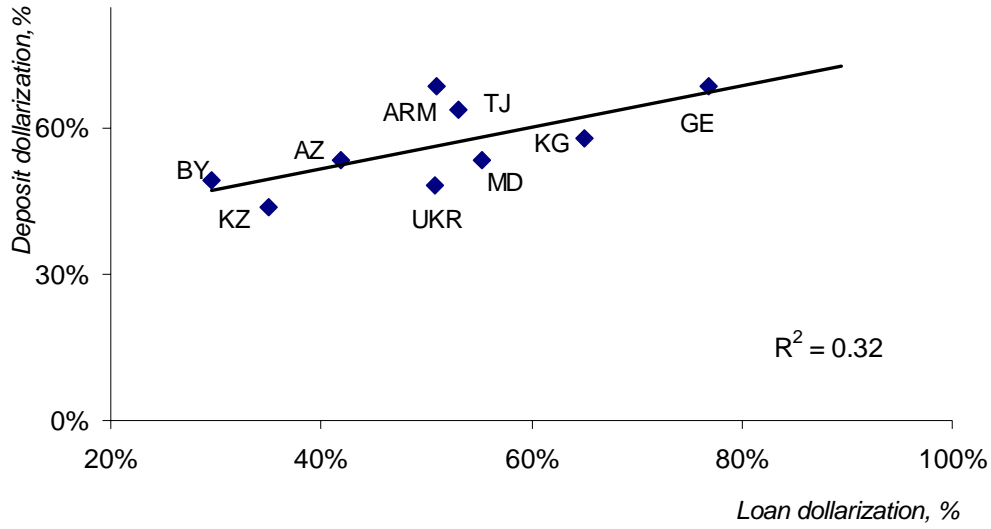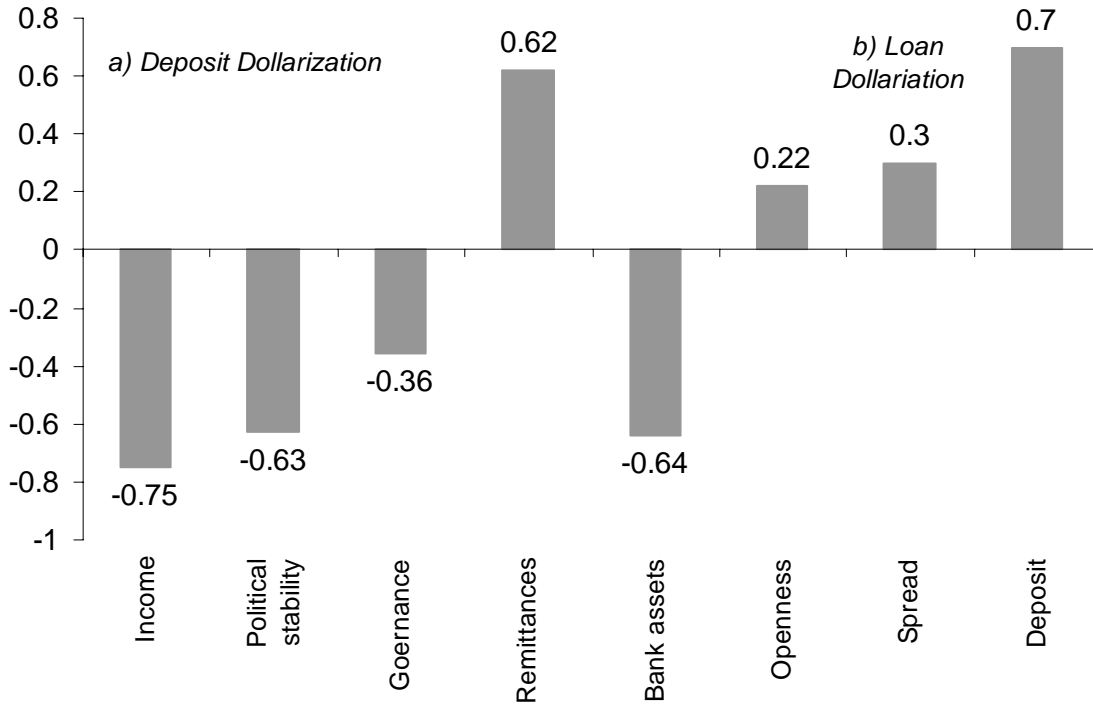
Figure 13. Loan vs deposit dollarization



Figure 14. Correlation analysis

6 Financial development and financial stability in a dollarized financial system

There is no formal study available on the relationship between dollarization and development of a financial system. The authors however show that high rates of inflation are associated with shallow financial markets.[13] Financial dollarization and monetary depth could in fact reflect certain economic developments and contexts rather than being interconnected. Figure 15 presents relationship between dollarization, represented by a deposit dollarization, and monetary depth measured by the ratio of broad money to GDP.

The chart supports the hypothesis about negative correlation between monetary developments and dollarization: the higher dollarization index is the lower is monetization of a given economy. This explains the fact that Central Asian economies have thin financial markets where the only way to make savings is to keep banking deposits denominated in foreign currencies. Indeed, in Tajikistan, monetization of the economy was only 16.5 per cent in 2005 while 75 per cent of deposits in 2006 were denominated in foreign currency.

Figure 15. Dollarization and monetary depth
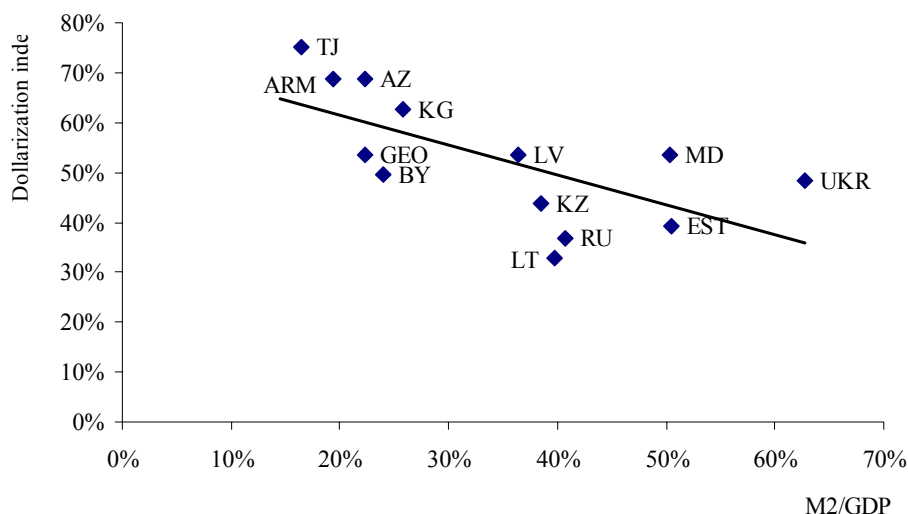
Source: IMF World Economic Outlook, central banks, CEIC

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[13] De Nicolo, Honohan and Ize, 2003

Countries with high levels of financial dollarization are among those that are characterized by fragile financial systems. Latin American economies constitute a good example of highly dollarized economies that have suffered financial crises in the last couple of decades. The risks emerges from the high indebtedness of residents, both corporates and households, and governments denominated in foreign currency. In case of rapid and large depreciation of local currencies, there is an immediate implication for increased exposition to a number of risks. Some authors however argue that the extent to which financial dollarization affects vulnerability of the financial system depends on the actual development of the financial intermediation in a given country and the extent to which residents are involved in foreign currency lending and borrowing.

The greater number of crises in Latin America in comparison to other regions reflects the fact that financial system fragility is more directly related to dollarization in this region.[14] At the same time, banking and financial intermediation in Latin America was more developed and capital accounts were characterized by a greater openness than in transition region. Hence, transition countries, and, in particular, countries in Central Asia become more vulnerable to such crises as their financial sectors develop and become more integrated into international financial markets. Table 3 below compares monetary depth and the size of banking sectors in Latin America with countries in Central Asia. Kazakhstan has comparable levels of the financial indicators. Latin America is however more exposed to the risks related to dollarization as it has a high level of banking sector indebtedness denominated in foreign currency.

Table 3. Foreign currency financial intermediation and financial system

Region/country	Foreign currency deposits to GDP	M2/GDP	Banking assets/GDP
Latin America	21.1%	29.3%	55.4%
Kazakhstan	11.8%	38.4%	63.6%
Kyrgyz Republic	9.1%	25.8%	51.3%
Tajikistan	6.9%	16.5%	20.7%

Source: Singh, et al. (2005) IMF Occasional Paper
Notes: Data for Latin America countries on foreign currency deposits is for 2001, M2/GDP and bank assets for 2003

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[14] See Gulde, et al. (2004), IMF Occasional paper.

The major risks arising from the dollarization of financial systems and banking institutions are solvency and liquidity risks. The solvency risk is directly related to the currency mismatch of the balance sheets of banks. In case of large depreciations, the quality of loan portfolio might be undermined. Even in the case of tight regulatory requirements on open foreign exchange positions, banks transfer the risk on unhedged borrowers while the credit risk is retained.

The liquidity risk is related to the fear of depositors that banks will not be able to provide dollar liquidity on demand in the context of a currency crisis. The chart below shows positive correlation between the financial dollarization and the quality of loan portfolio. The latter is measured as a ratio of non-performing loans to total loans in local banking systems. The greater is dollarization index, the poorer is the quality of loan portfolio. Kazakhstan and Tajikistan had the highest NPL ratio in 2009 explained by different reasons. Kazakhstan's financial system appeared to be the most advanced and integrated into international financial relations with an important representation of foreign banks. The credit crunch that started in 2007 has had its toll on the Kazakhstan's banking system starting from 2009 when local banks lost the ability to borrow in international markets and had to stop their local lending activity. At the same time, the central bank had to conduct a large devaluation of the local currency in February 2009 as the local currency was under serious pressure after Russian monetary authorities devalued ruble earlier that year. Devaluation of the local currency in Kazakhstan had had its effect on the quality of credit portfolio as the share of foreign currency denominated deposits was around 48 per cent in 2009. The credit crunch increased the liquidity risk of the banking institutions.

Figure 16. NPL and dollarization
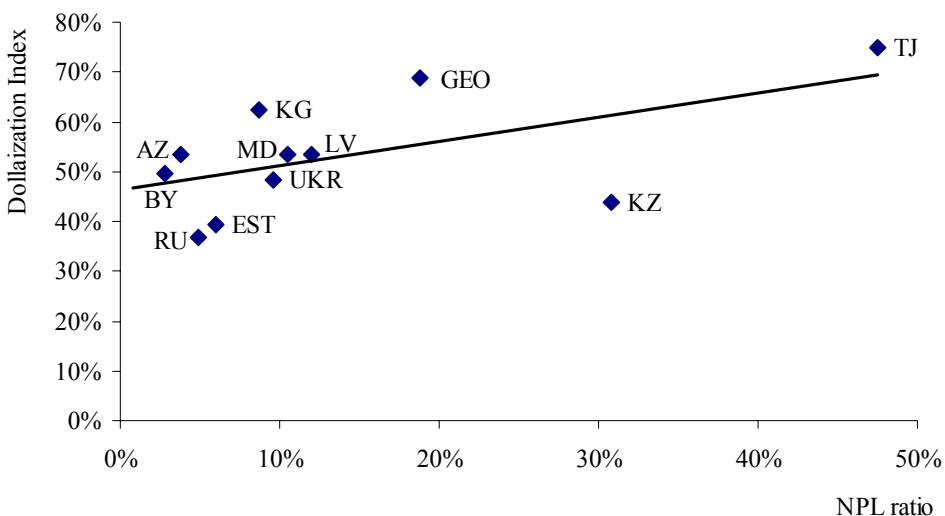
Source: CEIC, National Banks

In Tajikistan the major issue related to the high NPL ratio was the debt of the cotton farmers that had to be restructured. The share of overdue loans to total loans was 44 per cent in the end of 2009. The share of foreign currency denominated loans in total overdue loans was however only 4.4 per cent. In the Kyrgyz Republic the situation of the banks loan portfolio was much better than in its neighbors and was only 8.9 per cent in 2009. It is however important to note that foreign currency denominated loans constitute the largest share among Central Asian economies, and was 62.1 per cent in 2009. Moreover, the shares of foreign currency loans to both corporate sector and household were about 62 – 63 per cent.

In this context, all three countries are exposed to both solvency and liquidity risks. These risks are in turn interrelated. Poor solvency of borrowers and banks in case if devaluations increases the credit risk and can result in large withdrawals of deposits. Although the financial systems of the countries are shallow in terms of the size of the economies, they might find themselves exposed to the risks related to financial dollarization and, hence, there should be a considerate analysis and monitoring of developments in banking system dollarization for monetary authorities to be able to tackle vulnerabilities of the banking system that derive from the foreign currency risks.

7 Concluding remarks

The study investigates the magnitude and importance of financial dollarization in the economies of Central Asia. In particular, the research agenda comprises constructing financial dollarization measures for the whole period examined and establishing major factors that drive financial dollarization.

Dollarization has developed in Central Asia as a consequence of the period of macroeconomic instability, high inflation and depreciating national currencies. Financial dollarization has arisen as financial markets represented mainly by the banking institutions had started to develop. Important capital and foreign exchange inflows into these economies through financial systems have resulted in high levels of dollarization as measured by deposit and credit dollarization. This might pose certain risks to the stability of the financial sectors in these economies. It is therefore important to investigate the major factors that drive dollarization. An important question is to establish whether there is a link between dollarization and financial system development and stability.

The major factors that affect deposit dollarization are related to memory of economic instability and high inflation. Moreover, such factors as institutions, quality of governance and income appear to affect the decision of residents to hold deposits in foreign currencies. Lack of financial instruments for savings proxied by the size of the banking systems has a negative correlation to dollarization as well. Countries with large inflows of remittances are among those with the highest levels of deposit dollarization. Loan dollarization appears to be affected by the openness of the economy and interest rate spreads. Moreover, there is an important correlation between loan and deposit dollarization which might be related to local regulations on the open position of the banks.

The past financial crises, in particular, in the countries of Latin America suggest a link between high levels of financial dollarization and financial stability. It is however not clear whether higher dollarization promotes financial development. There is however a clear correlation between dollarization of banks' assets and their exposition to solvency and liquidity risks. The banks in Central Asia have large shares of their credit portfolio denominated in foreign currency. The simple correlation analysis shows that there is a positive relationship between the bad quality of the credit portfolio and a level of credit

dollarization. The monetary authorities of the countries in the region have to react by adopting appropriate measures to deal with the vulnerabilities of the banks related to foreign currency and to further promote development of the financial sectors and the use of the local currencies.

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