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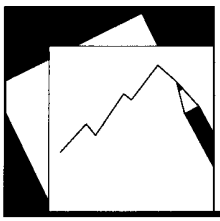

IMF Working Paper

Modalities of Moving to Inflation Targeting in Armenia and Georgia

Era Dabla-Norris, Daehaeng Kim,
Mayra Zermeño, Andreas Billmeier,
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Abstract

This paper reviews the current monetary and exchange rate policy frameworks in Armenia and Georgia, and the challenges associated with the choice of a credible nominal anchor in the context of large nominal and real shocks. The paper makes a case for a gradual transition to full-fledged inflation targeting (FFIT) in both countries in the medium term. The implications of this option are examined from various angles. In particular, the monetary transmission mechanisms and compliance with major institutional prerequisites for successful FFIT adoption are analyzed. Based on this analysis, the paper identifies a series of short- and medium-term recommendations, drawing on the experience of emerging market countries that successfully moved to FFIT.

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Keywords: Armenia, Georgia, monetary policy, inflation targeting

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I. INTRODUCTION

Despite a relatively favorable inflation performance in recent years, Armenia and Georgia—two countries in the South Caucasus—face a number of similar monetary and exchange rate policy challenges. Sizable foreign exchange inflows, shifts in money demand in the context of high dollarization, and relatively shallow and unsophisticated securities markets have made it difficult to choose a credible nominal anchor.

In the face of similar challenges, a number of developing and transition economies have recently adopted full-fledged inflation targeting (FFIT) as the main anchor guiding monetary policy. At the time of FFIT adoption, these countries were characterized by a medium to high level of policy credibility, clear commitment to their inflation target, and institutionalization of this commitment in the form of a transparent monetary framework that fosters accountability of the central bank to the target.[1] Recent empirical evidence for emerging market countries suggests that FFIT outperforms other monetary regimes as measured by inflation, inflation expectations, and volatility in the output gap, exchange rate, interest rate and international reserves (Batini and Laxton, 2005).

However, FFIT is not feasible in Armenia or Georgia in the short term in view of their vulnerability to economic shocks, poor coordination between fiscal and monetary policy, underdeveloped financial systems, institutional weaknesses, and limited central bank technical capacity. This being said, theory and experience from both industrial and emerging market countries suggest that a clear inflation objective and a commitment to a target, even in lieu of FFIT, can be a reliable policy option to secure price stability in the face of large shocks. Such an implicit or "lite" inflation targeting (IT) framework can be viewed as a transitional regime, where countries adopt more eclectic approaches, possibly based on several policy objectives, while putting in place elements that have been found to be critical for adopting FFIT.[2]

This paper reviews the experiences of Armenia and Georgia in implementing their current monetary and exchange rate policy frameworks and highlights the key challenges of transition toward FFIT.[3] It has direct operational relevance for Armenia because this country has already established IT lite and expressed its desire to adopt FFIT in the medium term. In contrast, Georgia is yet to decide on the merits of moving towards IT lite and ultimately FFIT. In this context, the paper identifies the main challenges in implementing the current

[1] For a detailed definition of FFIT, see Mishkin (2000).

[2] Stone (2003) defines an inflation targeting "lite" regime as one where the central bank announces a broad inflation objective but owing to its relatively low credibility is not able to maintain inflation as the foremost objective.

[3] This paper is based on the information available as of September 30, 2006.

monetary policy framework in Georgia, and suggests a gradual transition toward IT lite and ultimately FFIT as a possible option for addressing these challenges. In any event, many IT-related recommendations would strengthen the existing monetary policy framework in Georgia, even if the authorities did not contemplate a transition toward FFIT in the foreseeable future.

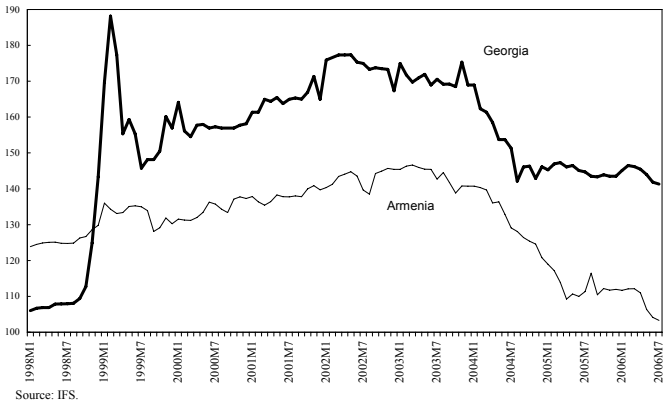
The paper is organized as follows. Section II describes the main issues in the existing monetary and exchange rate frameworks in Armenia and Georgia. Section III presents an empirical analysis of monetary policy transmission mechanisms and contrasts its findings and policy implications with the current monetary and exchange rate operating frameworks. Section IV identifies gaps in each country's conformity with macroeconomic and institutional prerequisites for FFIT, and provides a number of recommendations on how to close these gaps. Section V concludes by recommending that both countries continue to improve their existing monetary and exchange rate policy frameworks and aim at meeting institutional and other prerequisites for FFIT in the medium term.

II. Challenges in Implementing Current Monetary Policy Frameworks

A. Brief Historical Overview

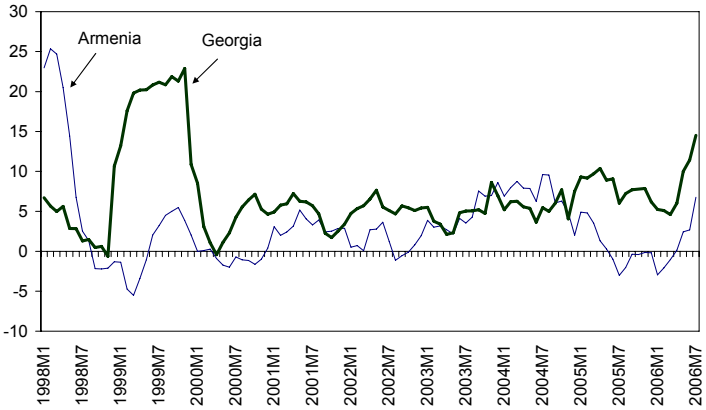
Both Armenia and Georgia relied on IMF-supported stabilization programs in the late 1990s to bring down inflation to single digits. During the early 2000s, Georgia and Armenia enjoyed low inflation and allowed their exchange rates to fluctuate around smooth trends, focusing on base money operating targets (Figures 1–2).

Figure 1. Armenia and Georgia: Exchange Rate Developments vis-à-vis the U.S. Dollar 1998–2006 (Jan.1996=100)



Source: IFS.

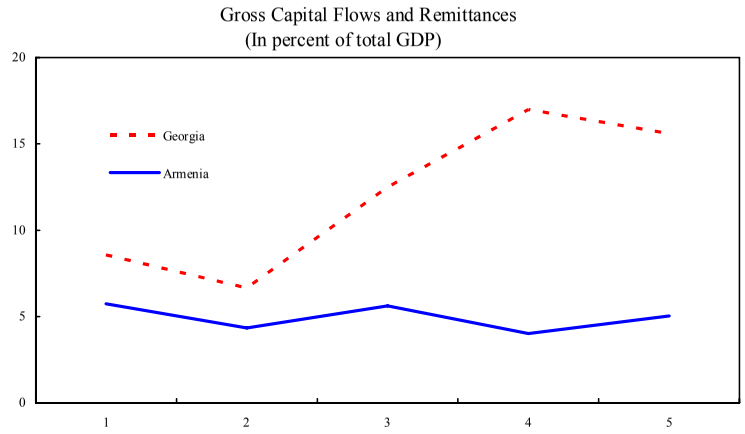
Figure 2. Armenia and Georgia: 12-month CPI, 1998–2006
(Percentage change)

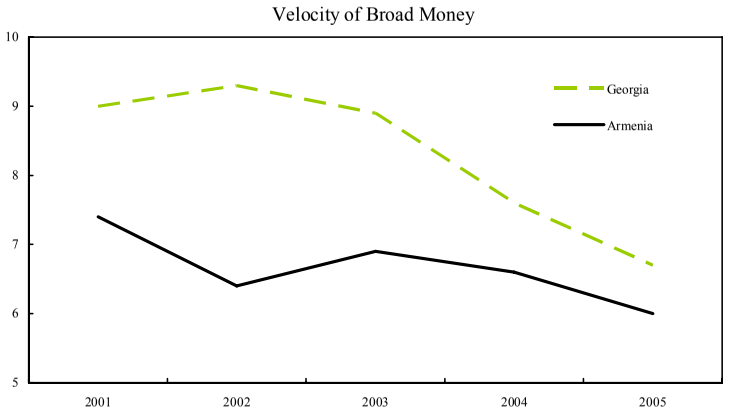


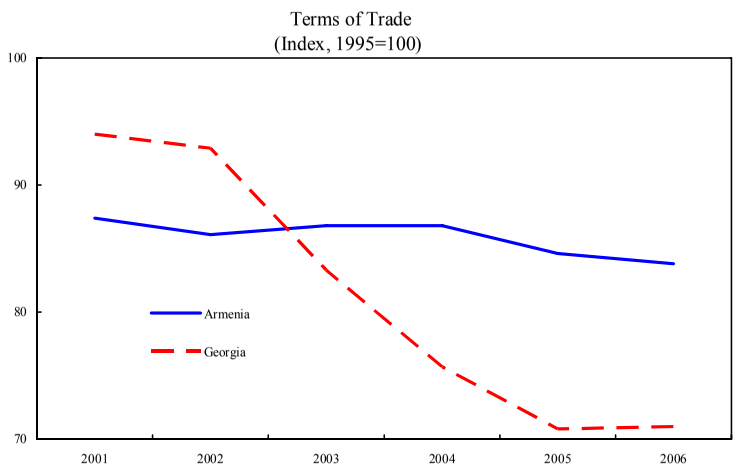
Source: IFS.

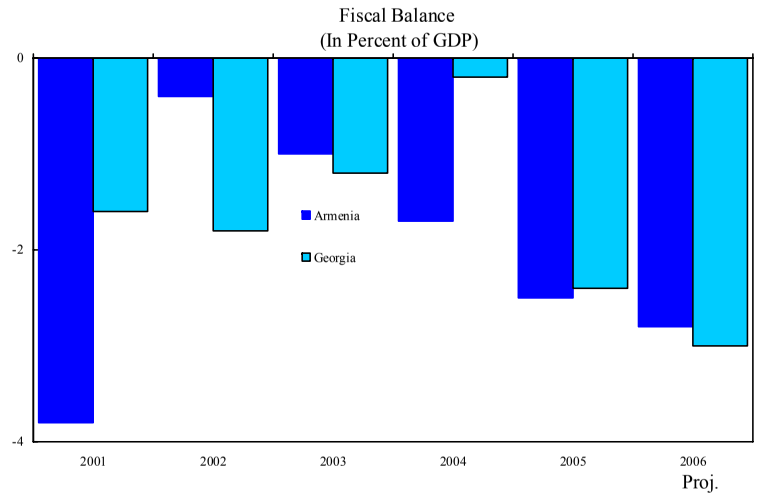
During 2003–05, large shocks buffeted the two economies as they experienced sizable increases in remittances, and FDI and export-related foreign exchange inflows, in part explained by a significant improvement in economic conditions in Russia and other CIS countries (Figure 3). At the same time, the two countries relaxed their fiscal policies, which

Figure 3. Armenia and Georgia: Selected Economic Indicators, 2001-06









Sources: Country authorities; and Fund staff estimates and projections.

1/ Fiscal balance for Armenia and Georgia.

was largely financed by external resources, such as foreign aid and privatization proceeds from nonresidents.

The Central Bank of Armenia (CBA) and the National Bank of Georgia (NBG) sought to address these large shocks by making their exchange rates more flexible, albeit to different extents (Figures 1-3). Greater exchange rate flexibility in Armenia throughout this period and in Georgia until late 2004 allowed them to absorb the external and fiscal shocks and to maintain inflation in single digits. Both countries continued to rely on base money operating targets.

B. Current Monetary and Exchange Rate Policy Regimes

In response to large shocks, the CBA announced in 2005 that it would adopt IT lite in 2006 and move to FFIT in the medium term. The CBA set the inflation target at 0–3 percent for 2006 and confirmed the consistency of this target with the 2006 budget in the monetary program approved by parliament. The CBA relies on the government securities repurchase agreement ("repo") rate as its primary operating target, but continues to pay attention to local currency base money growth (secondary operating target), which is reflected in its monetary program.

Table 1. Armenia and Georgia: Monetary and Exchange Rate Policy Frameworks, end-June 2006

	Armenia	Georgia
Inflation target announced	Yes	Yes 1/
Time horizon	Calendar year	Calendar year
Who determines the target	Central bank and government	Parliament approves central bank suggestion
Type of inflation target	End-year CPI	End-year CPI
Specificity	Less than 3 percent	Varies; 2006: 5–6 percent
Public commitment to transition to full-fledged inflation targeting (FFIT)	Yes	No
Primary intermediate target	Inflation forecast	De facto, an exchange rate band
Secondary intermediate target	No	Inflation forecast
Primary operating target	Repo interest rate	De facto, exchange rate band
Secondary operating target	Local currency base money	Local currency base money

Sources: Country authorities; and Fund staff estimates.
1/ The National Bank of Georgia (NBG) announces an end-of-year forecast not a target.

Notwithstanding persistent shocks, the NBG has limited exchange rate flexibility since late 2004. The 2006 monetary program approved by parliament announced the NBG's key objectives to maintain the external purchasing power of the currency and price stability with an inflation forecast of 5–6 percent. However, the monetary program did not explain how a potential conflict between the two key objectives, should it arise, would be resolved. Moreover, numerous budget revisions were undertaken in 2006 with only limited consultations with the NBG, undermining the credibility of the initial monetary program.

Since late 2004, the NBG appears to have attributed a greater weight to the stability of the external value of the currency rather than price stability. In fact, arguably for fear of generating a nominal exchange rate appreciation outside the observed +/-2 percent band, the NBG delayed a needed revision of the original base money path,[4] when inflation started to significantly exceed the initial forecast range in May 2006. Based on these observations, the exchange rate band rather than base money appears to be the NBG's primary operating target in practice.

The recent inflation performance in both countries largely reflected the extent of exchange rate flexibility. In Armenia, a strong public commitment to low inflation in the context of IT lite, supported by progress in developing indirect monetary policy instruments and increased exchange rate flexibility, has helped maintain inflation close to the target.[5] In Georgia, limited exchange rate flexibility in the face of large shocks has contributed to sharply rising inflation since early 2006.

The political concerns about exchange rate flexibility in Georgia, but also to some extent in Armenia, appear to be rooted in the following considerations:

- the desire to maintain competitiveness through resistance to real exchange rate appreciation pressures caused by fundamental factors;
- the intent to preserve the local currency value of significant dollar-denominated remittance inflows and the largely foreign currency-denominated savings of the population.

III. THE CHOICE OF OPERATING TARGETS

Despite the differences in their monetary policy operating frameworks and in the degree of their interest in adopting FFIT, both central banks seek to achieve certain inflation objectives. This raises the issue of whether their operating frameworks are consistent with the nature of the monetary policy transmission mechanisms. More specifically, the choice of the primary operating target needs to be justified.

The experiences of countries that transitioned to FFIT suggest that operating targets under IT would need to be (i) under the control of the central bank; (ii) strongly related to inflation; (iii) easily quantified and with little discretion and ambiguity in their measurement; (iv) relatively easy to forecast; and (v) easy to observe and understand by policy makers and the general public. While developed FFIT countries exclusively use interest rates as

[4] The NBG considers local currency base money as its primary operating target.

[5] The minor target overshooting in Armenia that has emerged since mid-2006 is mainly explained by supply-side shocks.

operating targets, some emerging market FFIT countries relied on exchange rates or narrow monetary aggregates as their operating targets during the early stages of FFIT adoption (Stone, 2003). The operating target choice in emerging market countries was usually made based on an empirical analysis of monetary policy transmission mechanisms.

This section reports some empirical findings regarding the links between inflation and a number of variables that could be used as operating targets (e.g., interest rates, money base, and exchange rates). In particular, it seeks to determine whether the repo interest rate in Armenia and the exchange rate in Georgia are the appropriate operating targets or whether other operating targets should be considered.

A. Transmission Mechanisms

In order to quantify the importance of monetary policy variables in determining changes in the consumer price index (CPI) in Armenia and Georgia, a VAR analysis was undertaken for the period 2000–06.[6] First, Granger causality tests were conducted to determine the significance of the policy variables, namely exchange rates, interest rates, and cash in circulation (CIC)[7] for CPI dynamics. Second, the importance of the exchange rate pass-through and other policy variables in explaining price dynamics was measured using variance decomposition and impulse response analyses. To this end, the innovations to the policy variables are identified using a Choleski decomposition with the following causal ordering: real GDP, the CPI, an interest rate, an exchange rate, and the CIC (Annex).

Granger causality test

The results of Granger causality tests on the significance of the policy variables differ across the two economies (Table 2). Overall, the tests[8] indicate the joint significance of policy variables whereas the bivariate tests produce mixed results. In Armenia, the exchange rate and the key policy interest rate have high predictive power for the CPI, with the CIC being insignificant. In Georgia, only the CIC "Granger" causes the CPI.

[6] The results of the VAR should be interpreted with caution given the inherent weaknesses in the data (see Annex for details on data and variables used).

[7] The CIC is highly correlated with local currency base money in both countries.

[8] Results are reported at a 5 percent significance level.

Table 2. Armenia and Georgia: Multivariate and Bivariate Granger Causality Tests (p-values)

Dependent Variables	Explanatory Variables				
			Armenia		
	CPI	REPO	Nominal effective exchange rate	Currency in circulation	All
Real GDP	0.09	1.00	0.65	0.00	0.00
	Real GDP	REPO	Nominal effective exchange rate	Currency in circulation	All
CPI	0.57	0.01	0.00	0.56	0.01
			Georgia		
	CPI	Lending rate	Nominal effective exchange rate	Currency in circulation	All
Real GDP	0.75	0.62	0.01	0.04	0.03
	Real GDP	REPO	Nominal effective exchange rate	Currency in circulation	All
CPI	0.38	0.59	0.16	0.01	0.04

Source: Fund staff estimates.

Exchange rate pass-through

The exchange rate pass-through——the amount of exchange rate change that translates into changes in tradable and even nontradable prices, and hence the CPI—has been found to be often high in emerging market countries, causing a fear of floating (Calvo and Reinhart, 2000). Some countries with a high exchange rate pass-through used exchange rates as operating targets (e.g., Chile, Israel, and Kazakhstan). The empirical analysis presented below finds a strong exchange rate pass-through in Armenia.

Variance decomposition. Shocks to the exchange rate explain a significant part of the fluctuations in prices in Armenia, while the impact is lower for Georgia. Table 3 shows the values of the variance decomposition of inflation considering a 2-, 4-, 6-, and 8-quarter horizon for each of the countries.

Table 3. Armenia and Georgia: Variance Decomposition of CPI
(In percent)

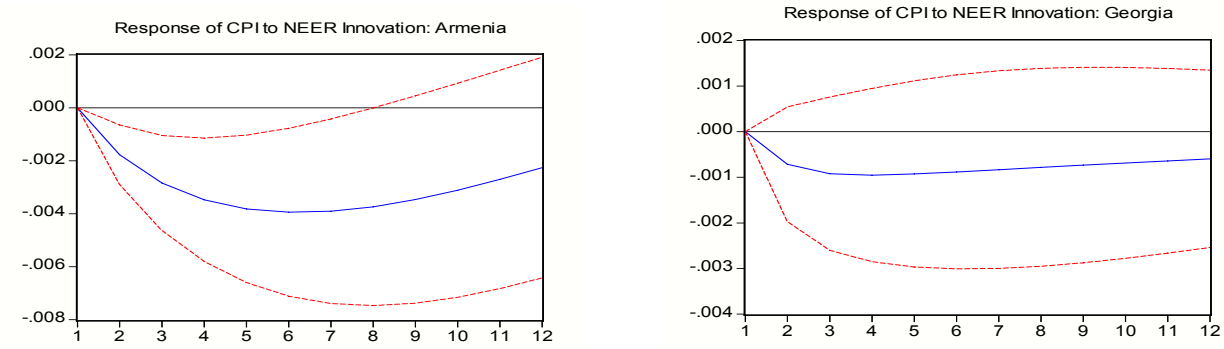
Number of Months	S.E.	Real GDP	CPI	Lending Rate 1/	Nominal Effective Exchange Rate	Cash in Circulation
			Armenia			
6	0.02	0.53	64.14	19.10	15.86	0.37
12	0.02	0.44	48.87	21.50	23.70	5.49
18	0.02	0.80	43.32	19.41	21.98	14.49
24	0.03	1.37	38.32	17.43	21.35	21.03
			Georgia			
6	0.01	7.64	75.60	0.20	2.49	14.06
12	0.01	10.74	67.69	0.31	3.62	17.64
18	0.01	11.48	65.83	0.33	4.08	18.28
24	0.01	11.67	65.33	0.34	4.25	18.41

Source: Fund staff estimates.

1/ For Armenia the repo rate was used.

Impulse response. Similarly, the impulse response functions show that the exchange rate pass-through to domestic prices is rapid and statistically significant in Armenia, while evidence is inconclusive for Georgia (Figure 4). Specifically, in Armenia, an exchange rate appreciation leads to a decline in prices within three months, and these responses are statistically significant for over 2 quarters. In Georgia, consistent with the variance decomposition results, the exchange rate pass-through is found to be correctly signed and small in magnitude. However, the results for Georgia are statistically insignificant because of wide confidence bands around the estimates, which is in part due to the short data series.[9]

Figure 4. Armenia and Georgia: CPI Response to an Exchange Rate Shock
(Response to Cholesky one s.d. innovations +/- 2 s.e.)



Source: Fund staff estimates.

Other policy variables

Interest rates and narrow monetary aggregates are other potential operating targets. The link between inflation and interest rates was relatively strong in some advanced emerging market countries even at the beginning of their transition to FFIT (e.g., Czech Republic and Poland), making it possible to use an interest rate as the operating target. In other countries, while the interest rate transmission channel was weak, narrow monetary aggregates had some statistically significant impact on prices, justifying the use of base money as an operating target (e.g., Peru). The empirical analysis presented below finds a strong impact of interest rates on the CPI only in Armenia.

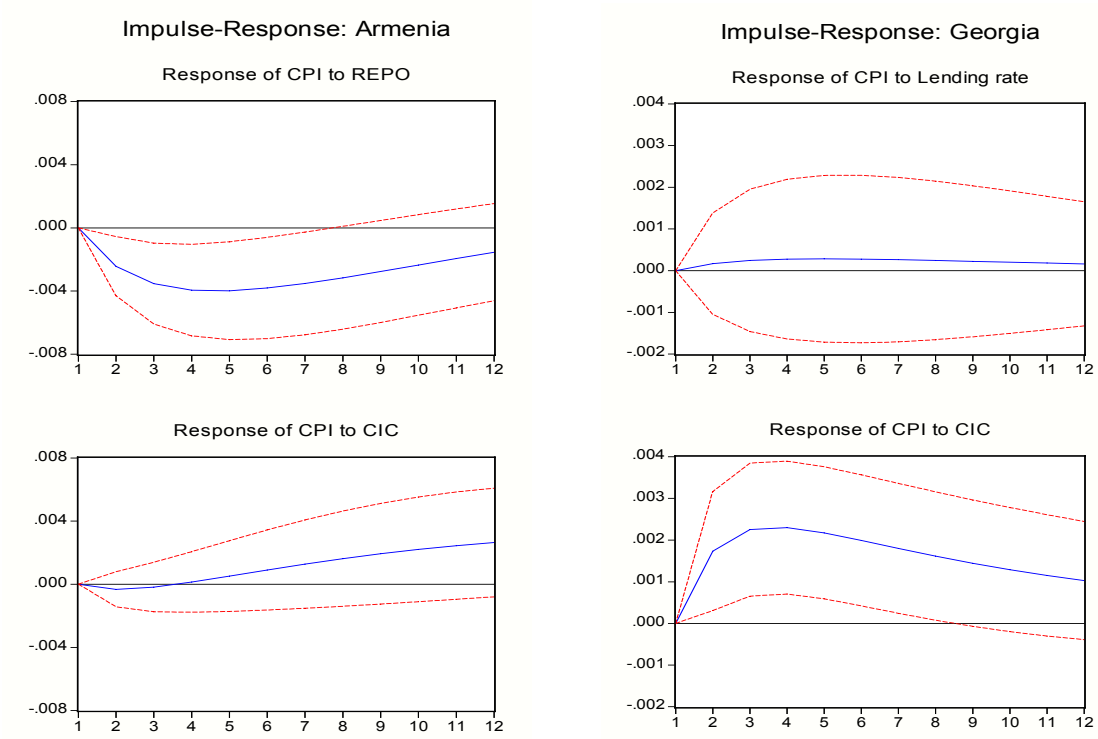
Variance decomposition. Shocks to the interest rate explain a significant part of the CPI variance only in Armenia. Shocks to the CIC have a moderate explanatory power for the CPI variance in Georgia, but not in Armenia.

[9] Using quarterly data from 1996–2006, Bakradze and Billmeier (2007) find a positive exchange rate pass-through that remains significant for 2 to 4 quarters. However, similarly to our results, they find that exchange

(continued…)

Impulse response. The interest rate channel seems to be effective only in Armenia, with a shock to the repo rate resulting in a rapid decline in prices that is significant for seven months (Figure 5). The inflationary effects of an expansionary monetary shock are rapid and significant in Georgia, while this effect emerges slowly in Armenia with marginal significance after 12 months.[10]

Figure 5. Armenia and Georgia: CPI Response to Interest Rate and CIC Shocks
(Response to Cholesky one s.d. innovations +/- 2 s.e.)



Source: Fund staff estimates.

B. Near-Term Policy Implications

In Armenia, the repo interest rate and the exchange rate have a statistically significant impact on monetary policy transmission mechanisms. This suggests that the current operating framework using the repo interest rate as the primary operating target is broadly appropriate. However, in the near term, the CBA would need to follow through with its plans for developing money markets and indirect instruments of monetary policy to strengthen the effectiveness of policy interest rates (Section IV). Moreover, given the significance of the

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rate shocks contribute very little to explaining the variance of the CPI once an interest rate is included in the VAR.

[10] This result is consistent with Dabla-Norris and Floerkemeier (2006).

exchange rate pass-through, the CBA would need to continue to follow closely exchange rate developments and influence the exchange rate level, if needed, to the extent it affects inflation, through indirect channels (e.g., interest rates) rather than through direct intervention, given the CBA's commitment to a managed float exchange rate regime.

In Georgia, only cash in circulation has a statistically significant impact on prices. Inconclusive empirical evidence on the strength of the exchange rate pass-through to prices in Georgia raises doubts about the effectiveness of the current de facto exchange rate band or any kind of exchange rate targeting to achieve low inflation. Thus, the NBG may need to consider adopting base money as its de facto primary operating target and adjusting it in a timely fashion to absorb unforeseen shocks. This would require greater exchange and interest rate flexibility.

IV. AN INFLATION TARGETING FRAMEWORK

There is a large body of literature on the prerequisites for FFIT adoption in emerging markets.[11] For the vast majority of the emerging market countries that successfully implemented their transition to FFIT, most of the following key preconditions were met at the time of IT adoption: (i) relatively stable macroeconomic fundamentals; (ii) price stability as the primary goal, de facto central bank instrument independence, and an established framework for transparency and accountability; (iii) lack of fiscal dominance; (iv) some degree of control over short-term interest rates and reasonably developed securities markets; (v) a reasonably stable financial system; and (vi) a relatively well-developed foreign exchange market (Table 4). For most emerging market countries, the desirable preconditions not fully in place included de jure central bank independence; sufficiently advanced modeling and forecasting capacity; a clear understanding of transmission mechanisms; and fully developed economic databases (Batini and Laxton, 2005).

Macroeconomic conditions in Armenia and Georgia are favorable in several respects. By comparison with the pre-adoption FFIT countries, Armenia and Georgia have lower inflation, higher growth, and sounder fiscal balances than some emerging market countries before their adoption of FFIT (Table 5). Public debt levels in Armenia and Georgia are somewhat higher than those prevailing in some peer countries, but not to a degree that would raise substantial concerns about medium-term fiscal sustainability.

However, financial system development in Armenia and Georgia lags behind comparator countries. Officially reported indicators of banking system soundness (measured by risk-weighted capital adequacy ratios and asset quality indicators) tend to be better in the two

[11] See Masson, Savastano, and Sharma (1997); Carare, Schaechter, and Stone (2002); and Khan (2003). Truman (2003); Jonas and Mishkin (2005); and IMF (2005) provide a more nuanced view on the importance of these prerequisites.

countries than in other pre-adoption FFIT.[12] Nevertheless, they exhibit lower financial sector development, as measured by broad money, private sector credit, and the stock market capitalization relative to GDP. [13]

Table 4. Conditions Met at the Outset of IT Introduction in Emerging Market Countries

Conditions	Countries
Price stability as the major goal of monetary policy	Colombia, Hungary, Korea, Philippines, Poland, Romania, Turkey (Hungary and Poland with exchange reate (ER) bands)
Price stability with other objectives	Brazil, Chile (ER band), Czech Republic, Israel (ER band), Mexico, Peru, South Africa
Central bank instrument independence	Brazil, Chile, Colombia, Czech Republic, Hungary, Israel, Korea, Mexico, Peru, Philippines, Poland, Romania, South Africa, Thailand, Turkey
Absence of fiscal dominance (access to central bank credit limited/ prohibited)	Brazil, Chile, Czech Republic, Hungary, Israel, Korea, Peru, Philippines, Poland Romania, South Africa, Thailand, Turkey
Transmission mechanism well understood:	
Basic at outset	Brazil, Chile, Czech Republic, Hungary, Israel, Korea, Philippines, Poland, Romania
Efforts continue	Thailand, Turkey
Reasonable degree of control over short-term interest rate	Brazil, Chile, Colombia, Czech Republic, Korea, South Africa, Thailand, Hungary Israel, Poland
Development of financial markets	
Well-developed	South Africa, Israel
Reasonably well-developed	Brazil, Chile, Korea, Mexico, Peru, Philippines, Czech Republic, Hungary, Turkey, Poland
Less developed	Romania
Reasonably stable financial system	Brazil, Chile, Hungary, Israel, Korea, Mexico, Peru, Poland, South Africa, Romania, Turkey
Modeling/forecasting capacity	Little at the start. All developed and improved over time

Source: Freedman and Otker-Robe (2005).

Another key area, where Armenia and Georgia differ from FFIT countries, is with regard to the degree of dollarization of their economies. Mishkin (2003) notes that high dollarization of the financial system can amplify the importance of exchange rate changes relative to domestic interest rate movements in policy transmission. Despite these difficulties, some countries, such as Peru, demonstrated that FFIT could be successfully adapted to the realities of high dollarization through a careful coordination of interest rate and foreign exchange market intervention policies (Leiderman, Maino, and Parrado, 2006).

[12] Recent rapid credit growth may have contributed to a decrease in the non-performing loans ratios, as low-quality loans become non-performing with a lag.

[13] Laurens and others (2005) note that such weaknesses alter the relative efficiency and speed of monetary transmission through different channels. Weak or incomplete financial markets can also limit the scope for reliance on market-based instruments—such as interest rates—for implementing policy.

Table 5. Macroeconomic Indicators in Potential IT and Pre-Adoption FFIT Countries

(In 2005, unless otherwise specified)

	Other Potential IT Countries					Pre-Adoption FFIT Countries							
	Armenia	Georgia	Albania	Kazakhstan	Ukraine	Peru	Colombia	Mexico	Romania	Czech Republic	Turkey 1/	Poland	Hungary
						2001	1998	2000	2004	1997	2004	1998	2000
Growth and Inflation													
Real GDP growth (annual percentage change)	13.9	9.3	5.5	9.7	2.6	0.2	0.6	6.0	8.4	-0.7	8.9	5.0	6.0
CPI (period average; percent change)	0.6	8.3	2.5	7.6	13.5	2.0	18.7	9.8	11.9	8.4	8.6	11.8	9.8
CPI (end of period; percent change)	-0.2	6.2	3.0	7.5	10.3	-0.1	16.7	8.9	9.3	8.2	9.4	8.6	10.1
Monetary and financial variables													
Broad money (percent of GDP)	16.4	16.5	50.8	27.7	45.7	26.2	35.6	45.0	26.2	65.0	42.8	36.7	46.2
Banking system credit to the private sector (percent of GDP)	8.2	15.0	14.5	37.4	35.6	24.2	23.5	17.2	17.5	60.7	19.8	22.5	33.7
Foreign currency deposits as percent of total broad money	38.5	44.0	35.9	33.5	23.6	67.1	...	2.9	4.0	14.3	41.2	...	18.5
Foreign currency deposits as percent of total deposits 2/	63.6	71.6	35.2	41.9	34.2	71.9	...	1.9	39.5	14.8	44.0	15.2	21.0
Financial system health													
Bank regulatory capital to risk weighted assets (in percent)	33.7	17.5	21.6	15.0	15.0	12.8	10.3	13.8	18.8	10.6	28.8	11.7	13.7
Stock market capitalization to GDP (in percent)	0.7	...	...	...	28.7	20.6	17.2	20.4	17.6	26.6	21.4	13.0	29.0
Bank assets to GDP (in percent) 3/	20.2	22.0	59.0	63.3	52.3	33.1	38.5	53.1	37.1	133.8	58.3	58.0	60.0
Domestic currency lending-deposit spread (percentage points) 3/	12.2	14.1	5.2	7.4	8.3	10.5	4.4	8.7	14.1	5.8	9.6	6.3	3.1
Fiscal variables													
Fiscal balance (percent of GDP)	-2.6	-2.4	-3.8	5.8	-2.4	-2.3	-4.0	-3.7	-1.0	-1.2	-8.1	-2.5	-2.7
Non-oil fiscal balance	...	...	...	-4.8									
Total public debt (percent of GDP)	25.7	36.2	54.9	4.1	19.4	46.6	22.1	23.2	23.1	12.0	63.5	36.7	54.4
Public domestic debt (percent of GDP)	2.1	9.1	38.1	4.0	4.8	10.8	10.6	12.3	5.3	7.8	46.0	...	36.1
Public external debt (percent of GDP)	23.6	27.1	17.0	4.0	14.6	35.8	11.5	10.9	17.8	2.7	17.5	...	18.3
Indicators of economic structure													
Nominal GDP (US$ billions)	4.9	6.4	8.4	75.5	82.9	53.9	98.4	580.5	71.4	57.1	302.6	172.0	47.0
Nominal GDP per capita in US$ dollars	1,517	1,484	2,615	5,074	1,727	2,107	2,411	5,855	3,207	5,542	4,286	4,441	4,600
Current account balance to GDP (in percent)	-3.3	-6.4	-7.0	-1.3	3.1	-2.1	-4.9	-3.2	-8.5	-6.3	-5.2	-4.0	-8.5
Trade openness (percent of GDP) 4/	80.2	96.4	67.0	98.0	85.9	33.3	31.3	42.5	86.6	108.7	66.8	56.8	151.6

Sources: Country authorities; and Fund staff estimates.

1/ Public external and domestic debt in percent of GNP.
2/ For Poland foreign currency liabilities in percent of total bank liabilities.
3/ 2002 data for Czech Republic.
4/ Defined as the sum of exports and imports of goods and services in percent of GDP.

The successful adoption of FFIT in Armenia and Georgia would require further progress in all the above-mentioned areas. This section focuses on the gaps in compliance with the key prerequisites and outlines major short- and medium-term recommendations on how to close these gaps. It also describes additional institutional measures that are needed to improve compliance with other prerequisites.

A. Primacy of the Inflation Objective, Central Bank Independence, and Formal Mechanisms of Accountability

A clear central bank mandate with primacy of the inflation objective, as well as operational independence to carry out this mandate, balanced with a formal mechanism for ensuring accountability, are key elements of FFIT.[14]

Primacy of the inflation objective and central bank independence

There are differences in the de facto implementation of instrument independence and the primacy of the inflation objective between the two countries (Table 6). In Armenia, the CBA's operational independence in conducting monetary and exchange rate policies, which was granted in 1996, has been substantially strengthened de facto recently. Also, the CBA has demonstrated in practice the primacy of the inflation objective enshrined in legislation by consistently meeting its inflation targets or explaining the reasons for temporary deviations. The NBG acquired instrument independence in 1995, but continues to be subject to pressure from the government and parliament with respect to its exchange and interest rate policies. Moreover, the NBG's law is not fully explicit on the primacy of the inflation objective citing "maintaining the currency's purchasing power" as another key objective.

Going forward, the existing weaknesses in central bank legislation and their current implementation need to be addressed. In the short term, the Georgian authorities need to examine whether the current legal framework is consistent with the notion of the primacy of price stability among their other mandates. A public declaration that price stability is the overriding goal could help reduce political pressure to influence the exchange rate. In Armenia, the central bank law, which currently mandates that the CBA sets targets for monetary growth and limits on the levels of net foreign assets and net domestic assets, will have to be modified to accommodate the new monetary regime focusing on policy interest rates. Over the medium term, the de facto operational independence of the NBG needs to be strengthened.

[14] While central bank operational independence is a well-established practice among IT central banks, the degree of autonomy from the government in decision making (policy goals and targets) varies considerably. The government typically sets the objectives of monetary policy, which are either laid out in the central bank charter or in government directives or agreements depending on the details of central bank legislation (Dabla-Norris, 2006).

Table 6. Armenia and Georgia: Central Bank Legislation, end-June 2006

	Armenia	Georgia
Central bank instrument independence		
De jure as reflected in legislation	Yes	Yes
De facto	Yes	No
Hearing in parliament on monetary policy	Yes	Yes
Reporting requirements	Regular to government, and annual report to parliament	Certified financial statement and annual report to parliament
Direct financing of the government prohibited		
De jure as reflected in legislation	Yes	Yes
De facto	Yes	Yes 1/
Unsecuritized claims on the government with below market returns	Yes	Yes
Primacy of inflation objective		
De jure as reflected in legislation	Yes	No
De facto	Yes	No
Compliance with International Financial Reporting Standards		
De jure as reflected in legislation	Yes	Yes
The recapitalization requirements		
De jure as reflected in legislation	Yes	Yes
De facto implementation is consistent with legislation	Yes	n.a.
The 2005 balance sheet statement reflected negative net worth	Yes	No

Sources: Country authorities; and Fund staff estimates.

1/ In Georgia, government financing was prohibited only recently.

Financial strength of the central bank

An important aspect of central bank independence for countries transitioning to FFIT is its financial strength, on which its credibility rests to a large extent (Sims, 2003; and Stella, 2005). While some central banks in emerging market countries with well-established credibility could operate effectively with insufficient capital prior to adopting FFIT,[15] the central banks that have yet to enhance their credibility would benefit from a strong capital base. Indeed, adopting FFIT requires greater market confidence that a central bank, particularly in emerging market countries, is willing to accept the balance sheet implications of raising interest rates or tolerating higher exchange rate volatility, when required to achieve its policy objectives.

In both countries, exchange rate appreciation and increased reliance on sterilization instruments have adversely affected the central banks' balance sheets. The Armenian government recapitalized the CBA in 2006, when a capital shortfall arose. However, the recapitalization was effected using nonmarketable securities, albeit at market-based interest rates. In contrast to Armenia, no shortfalls in the central bank's capital have been recorded in

[15] Chile and the Czech Republic are examples of IT countries whose central banks operated successfully despite having negative capital. In the Chilean case, the negative capital was not a constraint because the government was committed to maintaining a budgetary surplus. In recent years, the Czech National Bank (CNB) has also experienced revaluation losses as a result of a strengthening currency. However, the CNB has already established its credibility in inflation targeting and operated in deep and liquid money markets. Also, its exposure to persistent revaluation losses should end with the adoption of the Euro.

Georgia; however, the long-dated low-interest non-marketable NBG claims on the government are booked at face value rather than in present value terms.[16] In addition, there is a lack of clarity in the profit distribution formulas in both countries.

Going forward, the financial strength of both central banks should be safeguarded. In the short term, compliance with International Financial Reporting Standards (IFRS) would need to be strictly enforced, and the profit distribution formulas would need to be clarified to ensure proper capitalization of the central banks. In the medium term, future recapitalization, if warranted, would need to be undertaken through issuance of dated government securities bearing market interest rates. Moreover, it is highly recommended that the remaining central bank claims on the government be securitized, in order to strengthen the income position of the central banks and increase the amount of marketable securities in their portfolios which they can use in their monetary operations.

Formal mechanisms for accountability

The operational autonomy delegated to an FFIT central bank must be balanced with accountability for achieving the target. While modalities of accountability vary across countries, most FFIT central banks have a clearly defined, single authority to which they are accountable for their monetary policy decisions (Table 7).

The CBA and the NBG are legally accountable to parliament for achieving their monetary policy objectives, but there are no formal mechanisms of penalties for non-compliance with targets. In Armenia, the governor of the CBA is required to appear in parliament on a regular basis (as in Hungary and Chile), and when summoned by parliament (as in Colombia and Mexico). Moreover, even prior to the adoption of IT lite in Armenia, any deviations from the annual monetary targets had to be explained to parliament. In Georgia, de facto formal mechanisms to ensure accountability to the announced inflation objective are somewhat weaker. For instance, notwithstanding the fact that the official inflation forecasts are reflected in the NBG's annual monetary program, they were missed in four out of the last five years without any serious consequences for the NBG.

Going forward, both countries would need to adapt their accountability requirements to the needs of FFIT in the medium term. First, the reporting requirements should reflect the primacy of the inflation objective and the central banks' policies to achieve it. Second, legal consequences for non-compliance with inflation targets should be formalized.

[16] The NBG has recently signed a memorandum of understanding with the government on a gradual conversion of these claims into marketable securities, of which 6 percent has already been converted.

Table 7. Accountability in Selected FFIT Emerging Market Countries

Country	Instrument Independence	Inflation Targeting in Law	Target Announcement	Hearing in Parliament	Reports Requirements
Brazil	Yes	No	Set by National Monetary Council, composed of finance minister, planning minister, and central bank president	No	Monetary Council reports to congress every year before March 31
Colombia	Yes	Yes	Jointly by central bank and government	Yes	Regular information to the executive and congress
Hungary	Yes	No	Jointly by central bank and government	Yes	Legislature
Mexico	Yes	No	Central bank	Yes	Biannual reports to the executive branch and legislature on the conduct of monetary policy
Peru	Yes	No	Central bank	No	Annual report to government about monetary program and economic performance; reports submitted to congress.
Philippines	Yes	No	Set and announced jointly by central bank and government	Yes	Legislature, president
Poland	Yes	No	Central bank	Yes	Legislature
South Africa	Yes	No	Government	No	Government, legislature
Thailand	Yes 1/	No	Government in consultation with central bank	No	Government

Sources: Berg (2005); and Roger and Stone (2005).

1/ There is room for government intervention.

B. Absence of Fiscal Dominance and Policy Coordination

Fiscal dominance, brought about by large levels of indebtedness that may one day be monetized, represents a risk to the central bank's ability to maintain price stability over the medium term.[17] Therefore, one key aspect of operational autonomy for all FFIT countries involves explicit provisions in the law limiting or even prohibiting central bank financing of fiscal deficits.

Current debt levels are moderate, and there is no direct central bank deficit financing in either country,[18] indicating the absence of fiscal dominance in the usual sense. However, fiscal pressures manifest themselves in a different fashion. They stem from weaknesses in policy coordination between the governments and the central banks at two levels: (i) the size of annual fiscal impulses is not coordinated with monetary policy objectives; and (ii) the central banks' ability to prepare liquidity forecasts and engage in effective day-to-day liquidity management is limited, due to lack of timely information from the treasuries.

Fiscal rules and policy coordination

Fiscal rules and formal coordination procedures between the government and central bank play an important role in enhancing FFIT credibility. For instance, the EU Stability and Growth Pact requires that the EMU countries maintain their fiscal positions close to balance over the medium term. It also establishes a 3 percent of GDP ceiling on general government net borrowing to accommodate cyclical factors. New Zealand and some other IT countires also have fiscal rules. Such rules facilitate monetary policy implementation by limiting the government's ability to pursue pro-cyclical policies and by guaranteeing long-term fiscal sustainability.

Armenia and Georgia have sought to present their annual budgets in the context of medium-term frameworks (MTEFs) to ensure macroeconomic stability and improve policy coordination. In Armenia, the government has increasingly relied on an MTEF in the preparation of the annual budgets, but this process could still be further improved. In Georgia, due to frequent annual budget revisions, the MTEF has not been binding on government spending.

Going forward, both countries would need to improve the coordination between monetary and fiscal policies in the context of multi-year annual budgets. This can be achieved through a consistent implementation of the existing MTEFs. These frameworks would help prevent

[17] Key implications of the so-called "unpleasant monetarist arithmetic" are discussed in Sargent and Wallace (1981) and the recent literature on the fiscal theories of the price level (Sims, 2003). Even in the absence of monetization, if fiscal imbalances are large enough, monetary policy will eventually become subservient to fiscal considerations, and an inflation target will have to be abandoned or seriously modified (Mishkin, 2003).

[18] In Georgia, the central bank, until recently, was able to lend to the government under specific circumstances.

the implementation of pro-cyclical fiscal policies, supporting the attainment of the inflation objective.

Treasury management

Accurate forecasting of the treasury's impact on banking system liquidity is essential for the successful implementation of IT. In most FFIT countries, the government coordinates its treasury operations with the central bank to varying degrees to avoid surprising liquidity shocks (Carare, Schaechter, and Stone, 2002; and Williams, 2004).

In Armenia and Georgia, coordination between the treasury and central bank in day-to-day liquidity management remains weak. The treasury deposits at the CBA and NBG display sizeable and occasionally unpredictable fluctuations during the year. This, in turn, translates into large swings in reserve money that the central banks have had limited capacity to offset, jeopardizing their ability to meet their inflation objectives. To address this issue, Armenia has set up a monetary and budget coordination committee conducting regular meetings. However, at times this committee faces difficulty in reaching consensus on the appropriate course of debt and liquidity management. The NBG, in close cooperation with the ministry of finance, has started to prepare one- and three-month liquidity forecasts, but at times even the treasury lacks information on the spending plans of some parts of government.

Going forward, better efforts at day-to-day policy coordination between monetary and fiscal policy are needed in both countries in the short term. These efforts should include the approval and implementation of quarterly and monthly public expenditure programs for the central government, and the establishment of more *effective* coordination committees comprising representatives of the treasuries and central banks, in line with the experience of other FFITs.[19]

C. Monetary Policy Operating Targets and Instruments

As was mentioned in Section III, virtually all FFIT central banks use an interest rate on instruments ranging in maturity from overnight to three months as their operating target.[20] Against this background, well-established central bank liquidity management facilities and

[19] In Peru, for instance, coordination and information exchange take place between government agencies and the central bank in regular high-level policy committees at two levels: (i) at the programming level—the macroeconomic assumptions for the budget, including the annual inflation targets, are set by the ministry of finance in coordination with the central bank; (ii) at the operational level—the fiscal committee meets each month to set government expenditure, foreign exchange purchases, and deposits, with the central bank participating in these meetings.

[20] A few countries, such as Peru, Colombia, and Mexico, used a monetary aggregate-based operating target in the early years of their transition to FFIT, but increasingly emphasized a short-term interest rate as the key operating target.

deep domestic securities markets become the key elements of effective monetary policy implementation.

In Armenia and Georgia, shallow government securities and interbank markets constrain the use of interest rates as an operating target. Commercial banks in both countries lack adequate amounts of low-risk government or central bank securities to use as collateral in their interbank transactions and when accessing the central banks' liquidity facilities (Tables 8 and 9). In Armenia, the development of the interbank and securities markets is hampered by maturity overlap between T-bills and central bank bills, their irregular auctioning, and a very limited amount of securities with maturities extending beyond 12 months. In Georgia, the securities markets are even less developed, as the treasury discontinued the issuance of securities in 2005; the NBG has, however, started auctioning its bills recently.

Table 8. Armenia and Georgia: Monetary Policy Instruments, end-June 2006

	Armenia	Georgia
Indirect instruments:		
Standing deposit facilities	Yes, used	Overnight deposits suspended
Standing credit facility	Yes, used	Yes, not used since July 2004
Interbank rates stay within a corridor	Yes, since 2006	No
Credit auctions	No	No
Deposit auctions	No	One in June 2006; none since July
Central bank securities auctions	Yes	No 1/
Open market operations with securities	Yes, used	Very rare; last in June 2005
Unsterilized purchases/sales of foreign exchange	Yes	Yes, main instrument
Derivatives in the foreign exchange market	Yes	Swap operations foreseen, but not executed
Direct instruments:		
Frequent changes to required reserves	No	No longer 2/
Differentiated requirements depending on currency	No	Yes

Sources: Country authorities; and Fund staff estimates.
1/ In Georgia, auctions started in September 2006.
2/ In Georgia, frequent changes occurred in 2004.

Frequent incidences of excess liquidity are the key obstacle to effective liquidity management. In the absence of reliable money markets or guaranteed access to central bank facilities, commercial banks in both countries tend to hold large excess reserves to cushion the impact of liquidity shocks. There is often excess liquidity, in addition to the excess precautionary balances of commercial banks, held with the central banks.[21] This non-precautionary excess liquidity is largely created through the central banks' unsterilized purchases of foreign exchange accommodating public sector conversion needs (Georgia), as well as large inflows of remittances and government deposits volatility (Armenia and

[21] However, it should be noted that it is difficult to estimate the size of non-precautionary balances.

Georgia) in the context of limited sterilization capacity. In this environment, changes to policy interest rates have little or no impact on liquidity conditions or interest rates charged by commercial banks on their products.

Table 9. Armenia and Georgia: Securities Markets, end-June 2006

	Armenia	Georgia 1/
Central bank (CB) securities		
Maturity	3, 6 and 12 months	…
Regular issuance	Yes	…
Auction type	Multi-price methods	…
Rediscount by CB	No	…
Secondary market	Yes	…
Government securities		
Maturities		
Less than 1 month	Yes	No
1 up to 6 months	Yes	No
6 up to 12 months	Yes	No
12 months and longer	Yes	Yes 2/
Regular issuance	Yes, depending on maturity	None since June 2005; before weekly
Auction type	Multi-price methods	Multi-price methods
	Cutoff rates	Cutoff rates 3/
Secondary market	Yes	Yes; rudimentary
Nonbanks participate	Yes	Yes
Nonresidents participate	Yes	Yes

Sources: Country authorities; and Fund staff estimates.

1/ The NBG began issuing central bank securities (certificates of deposit) of 1- and 3-month maturities in September 2006.
2/ Securitized debt; converted from government debt held by the central bank that was previously nonmarketable.
3/ 20 percent of total amount auctioned reserved for non-competitive bids.

The CBA and NBG are addressing the excess liquidity issue. The CBA is draining non-precautionary excess liquidity by issuing its securities. It also fosters the development of the interbank market, in order to reduce precautionary excess liquidity and increase the effectiveness of the impact of its policy interest rates (in particular, the repo or reverse repo in open market operations) on the marginal cost of funds for commercial banks. To reduce interest rate volatility, the CBA has also recently started to target an interest rate corridor in the interbank market, using one-day standing deposit and lending facilities. The NBG tries to fine-tune short-term liquidity conditions through deposit and credit auctions, but these operations remain limited in their scope, and interest rates are not fully market-determined. Moreover, Georgia has made limited progress in developing its interbank market.

Going forward, the authorities of both countries would need to improve the effectiveness of their policy interest rates in the short term. This would require establishing (Georgia) or maintaining (Armenia) a corridor for interbank interest rates using standing facilities. These facilities could be used to define a wide corridor for the overnight rate and to signal the stance of monetary policy. Fixed or variable rate repo or reverse repo operations could then be used to steer short-term interest rates within the corridor, and signal the near-term policy

stance. This approach assumes that the central bank allows banks to access its lending and deposit facilities at rates that would lock the overnight rate within the corridor. The latter, however, should be wide enough to encourage banks to deal with one another in the first instance before accessing central bank facilities.

In addition, the government securities market could be further developed over the medium term, provided the following measures are implemented within a relatively short period of time: (i) auctioning securities at regular intervals according to a pre-announced schedule irrespective of whether there is an immediate shortfall of funds at the treasury; (ii) eliminating the overlap in maturity between the central bank and government securities, with the central banks focusing on short maturities (up to 6 months) and the treasuries on longer maturities (more than 6 months); and (iii) having the treasuries issue longer-term securities in greater quantities to help build up a benchmark yield curve.

D. Financial System Stability

A sound and well-functioning banking system is an important precondition for establishing reliable and stable transmission channels and removing balance sheet considerations from monetary policy making.

Insufficient competition and the large size of the "grey" economy are the key obstacles to banking system development in Armenia and Georgia. Many institutions operate in niche markets catering to special clients.[22] As a result of low competition, interest rate spreads (averaging over 10 percent at end-2005) are substantially higher than those in other transition countries that are characterized by greater financial sector competition (e.g., around 2 percent in Estonia and 8 percent in Russia at end-2005). Moreover, the prevalence of the grey economy and bank-specific factors, such as opaque ownership structures and inadequate risk-assessment capacities, also contribute to the high spreads.

While there has been some recent improvement in banking sector soundness indicators (Table 10), banking supervision in Armenia and Georgia faces a number of common issues. Weak corporate governance, in particular in Georgia where fit and proper ownership criteria need to be strengthened, and frequent incidence of connected lending represent significant concerns for banking system stability. Moreover, the recent rapid credit growth raises concern about the quality of loan portfolios in light of limited risk assessment capacity. Finally, in Georgia, the enforcement of prudential regulations, which are broadly in line with international best practice, is patchy at times in part due to lack of qualified staff.

Going forward, in the immediate future, significant progress in strengthening banking supervision can be achieved. Although the prudential regulations are broadly adequate, both

[22] At end-2005, the six largest banks in Georgia held above 85 percent of the system's total assets, loans, and deposits, while the five largest banks in Armenia accounted for 55 percent of banking system assets.

central banks may need to tighten asset classification and provisioning rules in the face of the rapid credit growth. Also, they would need to enhance the supervisory framework to also cover interest rate and market risk against the background of higher exchange and interest rate flexibility. In addition, Georgia would benefit from a more rigorous enforcement of prudential regulations and from adopting fit and proper requirements for banks' owners consistent with international best practice. In the medium term, the authorities in both countries would need to foster competition in the banking system.

Table 10. Armenia and Georgia: Financial Soundness Indicators, 2003–05
(In percent)

	2003	2004	2005
Armenia			
Capital adequacy (total regulatory capital to risk-weighted assets)	33.8	32.3	33.7
Liquidity (liquid assets to total assets)	47.5	47.1	44.2
Profitability			
ROA (profits to period average assets)	2.7	3.2	3.1
ROE (profits to period average equity)	14.4	18.4	15.5
Nonperforming loans to gross loans	5.4	2.1	1.9
Provisions to nonperforming loans	34.3	77.0	70.7
Georgia			
Capital adequacy (total regulatory capital to risk-weighted assets)	20.3	18.8	17.5
Liquidity (liquid assets to total assets)	43.3	45.0	33.3
Profitability			
ROA (profits to period average assets)	4.0	2.4	3.2
ROE (profits to period average equity)	15.0	10.0	14.7
Nonperforming loans to gross loans	7.5	6.2	3.8
Provisions to nonperforming loans	...	...	...

Source: Country authorities.

E. Foreign Exchange Market

There is extensive literature demonstrating that operating a flexible exchange rate regime requires a sufficiently liquid and efficient foreign exchange market for price discovery (Duttagupta, Fernandez, and Karacadag, 2004). Sarr and Lybek (2002) identify a high turnover and a wide range of active market participants as the key elements ensuring market liquidity. The existence of derivative markets is also important for deepening the foreign exchange markets, provided the appropriate supervisory framework is firmly in place.

The retail and interbank foreign exchange markets in Georgia and Armenia are reasonably competitive and liquid with a significant number of well-established market-makers. In the medium term, both countries will need to develop foreign currency derivatives markets once the appropriate supervisory framework has been established.

F. Other Issues of Operational Design

Inflation target index

All FFIT countries have chosen to target a measure of the CPI because it is widely followed, published regularly, and broad based, allowing it to capture overall price patterns. However, in deciding what measure of the CPI—headline or core—to target, most emerging market FFIT countries face a trade-off between transparency and the ability to control inflation.[23]

While headline inflation is most familiar to the public and more relevant for decisions of economic agents, it tends to be influenced by the fluctuations of highly volatile components (e.g., food and energy prices) and administered prices. Both groups of prices are often beyond the control of the central bank. To filter the impact of supply shocks causing volatility of certain CPI items, some FFIT central banks target a core CPI measure (e.g., South Korea[24] and Thailand), and some have specific escape clauses (e.g., Czech Republic).

Armenia and Georgia attach the highest importance to headline inflation. The CBA targets the headline CPI, and its 2006 monetary policy statement has identified several factors which could justify a temporary deviation from the target.[25] The CBA also compiles and publishes a core CPI for information purposes, but it is not a binding target. The NBG publishes annual forecasts of the headline CPI and historical series of various core CPI measures.

Going forward, the national statistics offices in both countries would need to take further steps to improve the quality of their CPI compilation methodologies, and take over from the central banks the production of core inflation indices to raise the credibility of the reported CPI data. In Georgia, it will be necessary to strengthen the de facto independence of its national statistics office to prevent government interference.

Numerical targets and target horizon

Establishing a numerical target for inflation and setting the target horizon are important aspects of moving to FFIT. However, for many countries transitioning to FFIT (e.g., for Chile, see Landerretche, Morandé, and Schmidt-Hebel, 2000 for details), the announced inflation objective was initially interpreted more as an official inflation projection rather than a formal or "hard" target. In some countries, these targets were initially set for a year ahead

[23] Silver (2006) provides a detailed methodological description of core CPI compilation.

[24] South Korea will start adopting headline inflation targets from 2007.

[25] These include (i) a significant divergence of world prices from forecast levels; (ii) large fluctuations in the exchange rate caused by external shocks; (iii) price changes arising from agricultural conditions; and (iv) natural disasters and other emergencies.

(e.g., Peru and Mexico), and multiyear explicit numerical targets were only set once the FFIT regime was adopted formally.

The two central banks target inflation ranges within a 12-month horizon. Both the CBA and the NBG set relatively narrow target bands for the headline CPI in their 2006 monetary policy statements.

Going forward, the setting and communication of inflation objectives could be further improved in Georgia and Armenia. It would be desirable for both countries to set a medium-term path for the inflation target together with the annual target.[26] Additional considerations include (i) setting inflation targets at least 12 months in advance to allow for lags in policy transmission, and (ii) making it clear that the central bank will generally aim to be near the center of the target range.

Inflation forecasting

The availability of forecasts for inflation and other macroeconomic variables over the relevant policy transmission horizon (which typically extends from 1 to 3 years for most emerging market FFIT countries) is a key prerequisite for conducting monetary policy effectively, as they serve as an intermediate policy guide under FFIT. In most FFIT emerging market countries, different methods—ranging from expert judgment to sophisticated structural model forecasting—are used.[27]

The CBA and the NBG face an inherent difficulty in relying on statistical models to forecast inflation due to data shortcomings, ongoing structural changes, and their vulnerability to shocks. Given these difficulties, they mainly rely on leading inflation indicators models and simple VARs (Tables 11 a–b). Leading inflation indicators include aggregate demand and supply variables, monetary aggregates, exchange rate measures, wages, and lagged price measures. However, the forecast horizon is only 12 months in both countries, which might not adequately take into account the transmission lags associated with monetary policy. They also complement their leading indicators models with auto-regressive integrated moving-average (ARIMA) univariate forecast series. In addition, simple "non-structural" VAR models, along the lines presented in Section III, are constructed to analyze the monetary transmission mechanisms. The use of structural VARs or General Equilibrium Models (GEMs) is at an exploration stage in both institutions.

[26] Khan and Senhadji (2001) recommend that inflation be no higher than 6–7 percent.

[27] For instance, at the National Bank of Hungary (NBH), the central inflation forecast relies on both partial and aggregate econometric equations and expert judgment (nonmodel approaches). The Czech National Bank (CNB) uses several models (e.g., core quarterly projections model and national institute global econometric model) for medium-term forecasts and for policy simulations. At the same time, however, short-term forecasts are prepared using expert judgment and partial econometric models.

Going forward, both central banks would need to refine their forecasting techniques. The priority should be given to extending the forecast horizon of the leading indicators models and compiling more reliable monthly indicators of real activity. As a medium-term objective, more effort would need to be devoted to developing structural VARs and GEMs. It is also recommended that GEM-based forecasts be calibrated based on the parameters found in similar models applied by central banks in other FFIT countries, given the statistical difficulties in estimating robust country-specific parameters in the South Caucasus region. Finally, forecasting should be closely integrated with the decision making process.

Transparency and communications strategy

Frequent and transparent communication with the public allows the central bank to enhance its credibility and influence inflation expectations without the need to resort to strong policy actions.

The CBA and NBG have recently enhanced the transparency of their operations (Table 12). In particular, they have communicated to the public their inflation objectives for the coming year and the main risks to their monetary programs, emanating from shifts in money demand, large foreign exchange inflows and other shocks. In addition, they have been reporting on monetary and exchange rate policies and on their financial standing through their annual and quarterly reports. Moreover, both central banks have started to publish their inflation forecasts 12 months forward and to disclose their forecast models. The two central banks have also increased the number of press releases and press conferences explaining their actions. However, as mentioned earlier, the NBG is not explicit about relative weights of inflation and exchange rate considerations in its objective function. Going forward, the NBG needs to improve its communication regarding the monetary and exchange rate policy framework.

Table 11a. Armenia: Status of Forecasting and Modeling

		Status (Yes/No)	Details
CPI and Core Inflation			
	Construct core CPI	Yes	Until mid-2004, core inflation excluded seasonal goods and administered prices was calculated. Currently the CBA calculates and officially publishes a 15 percent trimmed mean CPI.
	Seasonally adjusted estimates of CPI	Yes	
	Estimate sub-groups of CPI	Yes	Inflation of any sub-group and any component of various items in the consumer basket is available.
	Estimate components of domestic CPI	Yes	
	Estimate import component of various items or sub-groups of CPI	Yes	
Modeling			
	Evaluation of monetary transmission mechanism		
	Analysis of exchange rate pass-through	Yes	There is some graphic and numeric evidence on exchange rate pass-through. VAR analyses also have been done, and some results on responses of inflation and import component of the CPI to exchange rate shocks are obtained.
	Effect of interest, credit and exchange rate channels	No	
	Estimates of money demand in Armenia	Yes	ADL-type model is used to estimate money demand in Armenia. Real GDP is the main explanatory variable. Interest rates are not included in the money demand function.
	Inflation forecasting	Yes	In the process of inflation forecasting various items or sub-groups of CPI have been separated, and equations for them have been specified and estimated. Unit labor costs, growth of agriculture, the exchange rate, and broad money are the main explanatory variables. Interest rates are not included in the model.
	Quantitative	Yes	
	Graphic and numeric	Yes	
	Stochastic	No	
	How many quarters (specify)	4 quarters	
	Estimate of potential GDP	Yes	Estimate potential GDP using Hodrick-Prescott filters and work on developing other approaches.
	Quarterly structural model (multi-equation)	Underway	
Other			
	Business surveys with inflation indicators (wages, profitability, capacity constraints, input and output prices, and inflation expectations)	Yes	Business surveys with the inflation indicators, such as changes of output prices, are available from 2005. Only a survey on inflation expectations of the banking community is available.
	Household surveys of inflation expectations	No	

Source: Country authorities.

Table 11b. Georgia: Status of Forecasting and Modeling

		Status (Yes/No)	Details
CPI and Core Inflation			
	Construct core CPI	Yes	Three different measures of core CPI—median, 20 percent trimmed, and weighted.
	Seasonally adjusted estimates of CPI	Yes	X12 ARIMA.
	Estimate sub-groups of CPI	Yes	Food products, alcohol and tobacco, cloth and footwear, housing, public health, transportation, communications, leisure and culture, education, hotels and restaurants, and miscellaneous goods.
	Estimate components of domestic CPI	Yes	A division of CPI into domestic and imported component carried out within the NBG (not the State Department of Statistics).
	Estimate import component of various item or sub-groups of CPI	Yes	See above.
Modeling			
	Evaluation of monetary transmission mechanism		
	Analysis of exchange rate pass-through	Yes	Not VAR analysis—OLS.
	Effect of interest, credit and exchange rate channels	No	
	Estimates of money demand in Georgia	Yes	An error correction model.
	Inflation forecasting	Yes	Simple error correction monthly model. Model uses the following variables: GDP, M2 (M3), Oil prices, CPI, GEL/US$ exchange rate, agriculture products prices, seasonal dummies and two dummies for December 1998 (financial crisis) and November 2003 (Rose revolution).
	Quantitative	Yes	
	Graphic and numeric	Yes	Fan-chart.
	Stochastic	No	
	How many quarters (specify)	4	
	Estimate of potential GDP	No	
	Quarterly structural model (multi-equation)	Underway	
Other			
	Business surveys with inflation indicators (wages, profitability, capacity constraints, input and output prices, and inflation expectations)	No	
	Household surveys of inflation expectations	No	

Source: Country authorities.

Table 12. Monetary Policy Transparency in Selected IT Emerging Market Countries

	Inflation/Monetary Policy Reports					Other Means of Communication		
Countries	Frequency	Review inflation performance and monetary actions	Inflation outlook	Accountable for report	Explicit targeting horizon	Publish: research/ models used for inflation outlook	Media and other public presentation	Publication of minutes of monetary policy committee
South Caucasus								
Armenia	Monthly monetary report Quarterly inflation report	Yes	One-year fan-charts with discussion	Staff	Yes	Yes	Yes	Yes, within 10 days
Georgia	Monthly monetary report Quarterly inflation report	Yes	One-year fan-charts	Staff	No	Yes	Yes	No
FFIT Countries								
Chile	Three times a year	Yes	Two-year fan-charts with discussion	Executive Board	4-8 quarters	Yes/Yes	Yes	Yes, within 6 weeks
Colombia	Two times a year	Yes	Two-year fan-charts with discussion	Executive Board	No	Yes/Most	Yes	No
Czech Republic	Quarterly	Yes	One and half-year with discussion	Staff/Executive Board	No	Yes/Yes	Yes	Yes, after 12 days
Hungary	Quarterly	Yes	Two-year fan-charts with discussion	Staff	18 months	Yes/Some	Yes	Yes, after 2 weeks
Mexico	Quarterly	Yes	Qualitative discussion	Bank as a whole	No	Yes/No	Yes	No Policy discussions and explanations through press release
Peru	3 times	Yes	Two-year fan-charts with discussion	Bank as a whole	No	Yes/No	Yes	No

Sources: Country authorities; Fund staff; Fracasso, Genberg, and Wyplosz (2003); Schmidt-Hebel and Tapia (2002); and central bank legal texts and websites.

V. Conclusion and Summary of Recommendations

In the last few years, against the background of large nominal and real shocks, Armenia and Georgia have faced difficulties in meeting their stated inflation objectives. They have been addressing the attendant challenges within different monetary and exchange rate policy frameworks. Armenia has established an IT lite regime and made a commitment to undertake a transition to FFIT in the medium term. Georgia has not made a decision regarding the appropriateness of FFIT, and only allows limited exchange rate flexibility.

The empirical analysis of monetary policy transmission mechanisms suggests that some modifications need to be considered to increase the effectiveness of the current monetary policy frameworks of both countries in the short run. While the CBA's focus on the repo rate is appropriate, the exchange rate would still need to be carefully monitored to the extent that it affects inflation. In Georgia, the de facto use of the exchange rate band is not likely to guarantee the achievement of its inflation objectives, and a move to base money as the de facto primary operating target may need to be considered.

Both countries still need to go a long way before fulfilling critical institutional pre-conditions for FFIT. The following key measures could be implemented in the short term:

- **Central bank legislation.** In Georgia, the NBG legal framework needs to be examined to make it consistent with the notion of the primacy of price stability; and in Armenia it may need to be changed to accommodate the new monetary policy regime focusing on policy interest rates.

- **Central bank financial strength.** To further ensure central bank independence, compliance with the IFRS and clarification on central bank profit distribution is needed in both countries.

- **Coordination with fiscal policy.** Better policy coordination between fiscal and monetary policy could be achieved by adhering to existing medium-term fiscal frameworks and setting up effective policy coordination committees in both countries.

- **Monetary policy instruments.** The effectiveness of the interest rate transmission channel could be strengthened in both countries by establishing (Georgia) and maintaining (Armenia) a corridor for interbank interest rates, using central bank standing facilities.

- **Banking system stability.** In Georgia, enforcement of banking supervision would need to be improved and fit and proper requirements for banks' owners consistent with international best practice would need to be adopted.

- **CPI data.** The national statistics offices would need to improve CPI compilation and start producing measures of core inflation in both countries.

- **Forecasting capacity.** Both central banks would need to improve their inflation forecasts by extending the forecasting horizon and incorporating more real sector information.

- **Communication strategy.** The NBG would benefit from more transparency in communicating about their monetary policy objectives and instruments.

And in the medium term:

- **Central bank independence.** The NBG would need to obtain de facto independence.

- **Securities and interbank markets.** The securities and interbank markets would need to be deepened by increasing the outstanding stock of marketable securities and improving the procedures for their auctioning and secondary market trading.

- **Banking system development.** Competition in the banking system needs to increase in both countries.

- **Foreign exchange market.** Derivative instruments in the foreign exchange market would need to be introduced once the appropriate supervisory framework has been established.

- **CPI data.** The statistics office in Georgia needs to be more independent.

- **Forecasting capacity.** The forecasting capabilities would need to improve in both countries' central banks to include structural models.

- **The target horizon** would need to be extended beyond 12 months.

Annex: Details on the VAR Analysis

In our baseline model, we consider interactions among real GDP, the consumer price index, and monetary policy variables. To focus on macroeconomic dynamics in the post-Russian crisis years, we use monthly data from January 2000 to March 2006 for both countries. The endogenous variables are ordered as follows: real GDP, the CPI, an interest rate, an exchange rate, and currency in circulation (CIC). The exchange rate is placed before the CIC as the high degree of dollarization implies that the exchange rate is more likely to have an immediate effect on monetary aggregates than the other way around.[28]

The use of exogenous variables in a general VAR analysis often helps solve the so-called price puzzle.[29] In the case of Armenia, the U.S. Federal funds rate is included since it explains a significant part of the opportunity cost of remittances. For Georgia, we consider both an oil price index and the U.S. Federal funds rate.

All variables except interest rates are seasonally adjusted and then taken in logarithms. Almost all variables in the models are I(1). First-differencing all variables was not conducted to avoid filtering out important dynamic interaction information. Cointegration analysis could have provided additional insights into the nature of monetary transmission mechanisms, but it was not conducted due to the lack of sufficiently long time series.

Table A1. Armenia and Georgia: Baseline Model

	Armenia	Georgia
Sample period	Jan. 2001–Dec. 2005	Jan. 2000–Mar. 2006
Endogenous variables	Real GDP CPI REPO rate Nominal effective exchange rate Cash in circulation	Real GDP CPI Lending rate Nominal effective exchange rate Cash in circulation
Exogenous variables	U.S. federal funds rate	Oil price index U.S. federal funds rate

[28] The ordering of the exchange rate and monetary aggregate makes little difference in our impulse-response analysis because of the low correlation in residuals of these two variables.

[29] The price puzzle describes the empirical finding that an interest rate tightening is followed by a price increase. Since the price puzzle results from an endogenous monetary policy reaction to external shocks, controlling external variables in VAR estimations generally resolves this problem.

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