



REPUBLIC OF ARMENIA

SELECTED ISSUES

March 2015

This Selected Issues paper on Armenia was prepared by a staff team of the International Monetary Fund as background documentation for the periodic consultation with the member country. It is based on the information available at the time it was completed on December 5, 2014.

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**International Monetary Fund
Washington, D.C.**



REPUBLIC OF ARMENIA

SELECTED ISSUES

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IS THERE SCOPE FOR FURTHER DEDOLLARIZATION POLICIES?¹

High financial dollarization makes Armenia more vulnerable to external shocks and limits its capacity to respond. The dedollarization strategy is broad and comprehensive, and has achieved a reduction of deposit dollarization in the past few years. Additional efforts should focus on reducing inflation volatility and external imbalances, using prudential regulations to increase foreign currency liquidity in the banking system, and strengthening the monitoring of currency mismatches. International experience suggests, however, that further reductions in dollarization are likely to occur only gradually.

A. Dollarization in Armenia: Stylized Facts

- 1. Financial dollarization in Armenia has been historically high, although it has experienced wide fluctuations.** In the third quarter of 2014, around 60 percent of total deposits and private sector credit was denominated in dollars (Figure 1, top panel), slightly below historical averages of 65 percent.² Dollarization rates have fluctuated widely, peaking at over 80 percent in the early 2000s, before declining to below 40 percent in 2007–08. With the global financial crisis, dollarization shot up again.
- 2. Dollarization has been closely linked to exchange rate developments and less linked to inflation developments** (Figure 1, mid-left panel). While this correlation reflects to some extent valuation effects, it goes beyond that. For example, in 2005–07, when the dram was on an appreciating trend, dram deposits grew significantly faster than dollar deposits (Figure 1, mid-right panel). By contrast, during the first quarter of 2009, there was a significant shift from dram deposits to dollar deposits during a time of sharp depreciation of the dram. These developments occurred in a context of relatively low inflation; inflation was generally in single digits after 1999, and never exceeded 12 percent during that period (Figure 1, bottom-left panel).
- 3. Dollarization has been more pronounced for time deposits, but has also been high for demand deposits** (Figure 1, bottom-right panel). This is not surprising, as concerns about the dram's role as a store of value induce agents to save in foreign currency, and restrictions on use of

¹ Prepared by Pedro Rodriguez (MCD) and Armineh Manookian (MCD/IMF Resident Representative Office).

² In this note, deposit dollarization only focuses on bank deposits included in the definition of broad money (M2) and is measured as the fraction of deposits denominated in foreign currency to total deposits. Credit dollarization is calculated as credit to residents denominated in foreign currency as a share of total credit to residents. For deposit dollarization, the average figure corresponds to the period 1995Q1 to 2014Q3, while for credit dollarization, it corresponds to 1996Q4 to 2014Q3.

foreign currency for domestic transactions discourage demand deposits in foreign currency. Still, dollarization of demand deposits has been typically high, and was near 45 percent in the third quarter of 2014.

B. Dedollarization Policies

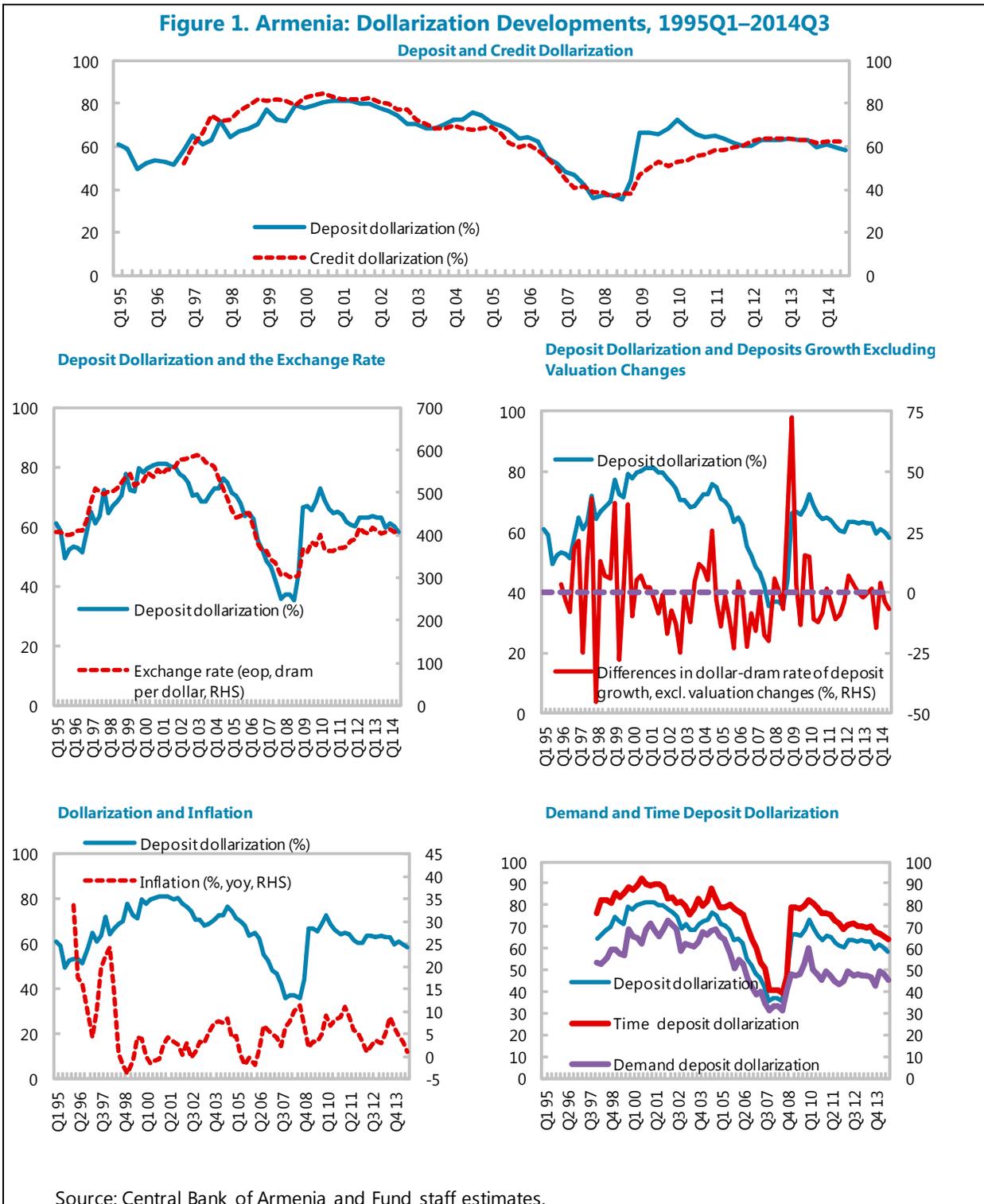
4. Armenia has a broad dedollarization strategy in place, including both macroeconomic stabilization and specific dedollarization measures:

- On macro stabilization, key achievements have been the reductions of inflation and the fiscal deficit. In addition, Armenia has been able to achieve some narrowing of the external current account deficit, although room for additional consolidation in this area persists.
- On dedollarization measures, Armenia has in place a wide range of actions from restrictions on use of FX for certain transactions, to prudential, supervisory, and crisis management measures (Table 1). Several of these measures have been introduced in the last four years (Table 2), as the CBA responded to higher dollarization. The strategy has relied significantly on differential reserve requirements (RRs) and use of the dram as the currency of denomination of RRs, and has also included measures to reduce FX liquidity risk and strengthen capital buffers.³ More recently, there has been a reduction in the rate of RRs for dram liabilities. The CBA has also introduced: (i) higher risk weights for the calculation of credit risk for FX loans; (ii) minimum liquidity ratios for FX liabilities; and, (iii) improved monitoring of currency mismatches.

5. Armenia's dedollarization strategy is consistent with the lessons derived from international experience. Countries have generally relied on a combination of macroeconomic stabilization, market-based dedollarization policies, and forced dedollarization policies (Kokenyne, Ley, and Veyrune (2010)). Among the market-based policies, countries have typically preferred prudential regulations (e.g., differential RRs for domestic and FX deposits) and supervisory measures.

³ Denominating all reserve requirements in domestic currency is typically a measure aimed at increasing the opportunity cost of foreign currency deposits, but can also act as a one-time foreign exchange intervention. Gray (2011) and Ize (1995) discuss the pros and cons of denominating reserve requirements for FX deposits in domestic currency.

Figure 1. Armenia: Dollarization Developments, 1995Q1–2014Q3



Source: Central Bank of Armenia and Fund staff estimates.

C. Impact of Dedollarization Measures

6. International experience suggests that dollarization is persistent, and that the impact of dedollarization policies only materializes gradually. Dollarization ultimately reflects lack of confidence in the domestic currency since, as argued by Vegh (2013), "...households are reluctant to rely on a currency whose value tends to fall over time and fluctuate wildly. Domestic currencies are probably the most vulnerable as a store of value, as real returns on domestic deposits often turn negative. The public reacts by taking refuge in foreign currency deposits in domestic banks." Reestablishing confidence in the domestic currency requires, therefore, achieving a good track record of macroeconomic stability, which in turn requires consistent implementation of sound monetary and fiscal policies over an extended period of time and, in some cases, institutional reforms (e.g., strengthening central bank independence). It is, therefore, not surprising, that successful dedollarizations are difficult to achieve (Box 1).

Box 1. Successful Dedollarization is the Exception, not the Norm

Reinhart, Rogoff, and Savastano (RRS) (2003) show that out of eighty five countries in a sample for 1980–2001, only four (Israel, Mexico, Pakistan and Poland) achieved a significant reduction in deposit dollarization. In addition, just two (Israel and Poland) achieved this without severe distortions in financial intermediation. Experience in the 2000s also indicates that dedollarization is gradual (e.g., Garcia-Escribano and Sosa [2011]) and subject to reversals (as in Armenia).

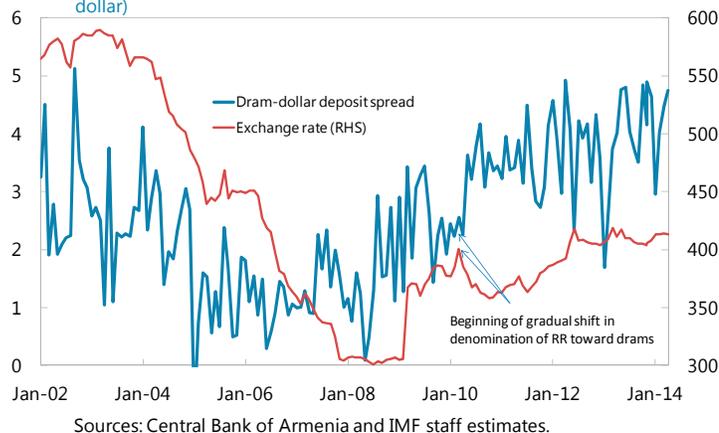
International experience also suggests that inflation stabilization is not a sufficient condition for dedollarization. Dollarization can last after successful disinflation has taken place. RRS show that a country's inflation history tends to be a better predictor of dollarization rates than current inflation. Garcia-Escribano and Sosa find that changes in inflation do not appear to have any short-term impact on financial dedollarization. Vegh (2013) argues that while lower inflation may have a significant impact on the use of domestic currency as a mean of exchange, it is likely to have a much lower impact on financial dollarization. Vegh (2013) further argues that lower inflation contributes to lower financial dollarization only to the extent that it is accompanied by lower variance in inflation.

Finally, international experience suggests a few elements that have contributed to dedollarization. RRS argue that in Israel and Poland "de-dollarization started almost at the same time that the authorities embarked on a (eventually successful) disinflation program centered around a strong exchange rate anchor, and the domestic financial system offered assets with alternative forms of indexation (Israel) or very high real interest rates (Poland)—see Bufman and Leiderman (1995) and Chopra (1994)". Similarly, Fernandez-Arias (2005) points out that international experience suggests that: (i) dedollarization prudential policies are necessary but risky (they may trigger financial disintermediation); (ii) dollar substitutes (e.g., inflation indexed instruments) are key for success but hard to find; and (iii) favorable economic conditions—e.g., reasonable access to foreign financing to contain a surge in temporary capital outflows—are important, if there is a perception that outflows could be triggered by prudential policies aimed at dedollarizing the financial sector.

7. Armenia’s dedollarization experience is in line with the international experience, with two periods in which progress was achieved.

During 2005–07, there was a reduction in deposit dollarization of almost 40 percent, mainly driven by macroeconomic reasons. Confidence in the banking sector had been improving following bank insolvencies in 2000–02, the economy was growing strongly, and the dram was appreciating in a context of large capital inflows (38 percent appreciation between end-2004 and end-2007). The CBA also introduced dedollarization measures (mainly for credit dollarization) by restricting FX consumer loans.

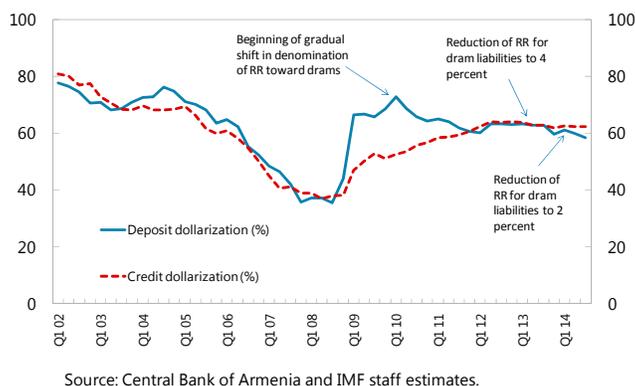
Armenia. Deposit Spread and the Exchange rate
(spread for short-term deposits in percent, exchange rate in drams per dollar)



Since Q1:2010, deposit dollarization has fallen from a peak of 73 percent to 58 percent in the third quarter of 2014. This period was also characterized by an improvement in macroeconomic conditions, particularly a reduction of the fiscal deficit, some consolidation of the current account, and relative exchange rate stability. However, prudential dedollarization measures seem to also have played a role, by impacting spreads between dram and FX interest rates.⁴

8. While recent prudential measures appear to have contributed to deposit dedollarization, their impact on credit dedollarization has been less effective. With the shift of the currency of denomination of RRs to drams, more dollar resources became available for lending, while banks also pursued an increase in dram deposits

Armenia. Deposit and Credit Dollarization
(in percent)



⁴ Dedollarization prudential measures aim to discourage financial intermediation in FX, by acting as a “tax” on that activity. The impact of the “tax” is expected to be reflected in FX interest rate spreads relative to dram spreads, and in turn, in the currency composition of bank portfolios. For instance, an increase in RRs on FX liabilities reduces banks’ profitability from financial intermediation in FX, and consequently, is expected to translate into an increase in FX lending-deposit spreads—as banks reduce their demand for FX deposits and their supply of FX lending.

to meet dram RRs.⁵ Furthermore, it is not clear whether prudential measures have been effective in modifying intermediation spreads in FX, as the lending-deposit differential (dram minus FX) has not changed significantly in recent years (Figure 2).^{6 7}

D. Is There Scope for Additional Dedollarization Policies in Armenia?

9. Overall, Armenia’s dedollarization strategy is quite comprehensive, which reduces the need and scope to implement additional measures. The strategy is already consistent with lessons from international experience. Armenia has achieved relatively low inflation, has implemented for a number of years a comprehensive strategy to reduce macroeconomic imbalances and vulnerabilities, and has in place a broad set of dedollarization policies that touch all key areas.

10. Nonetheless, there appears to be room for action in a few areas:

Macroeconomic stabilization

- Reducing inflation volatility may help increase the credibility of the inflation targeting regime and lay a sounder foundation for dedollarization.⁸ This will not be simple, as much of the inflation volatility comes from international commodity prices. But better communications on the sources of inflation volatility could help improve the reliability of the dram as a store of value. Another measure would be creation of inflation-indexed instruments, although this could bring volatility risks into the banking system (e.g., risks of volatility of commodity prices).
- The 2009 crisis reminded agents that Armenia still faces challenges in terms of crisis mitigation. In particular, the external current account deficit remains high, and with it, concerns that the real ER may be misaligned. It remains important that the CBA allows the ER to move according to its fundamentals, or a risk may arise of one-side (depreciation) bets on the ER that would discourage private agents from rebalancing their portfolio towards drams.

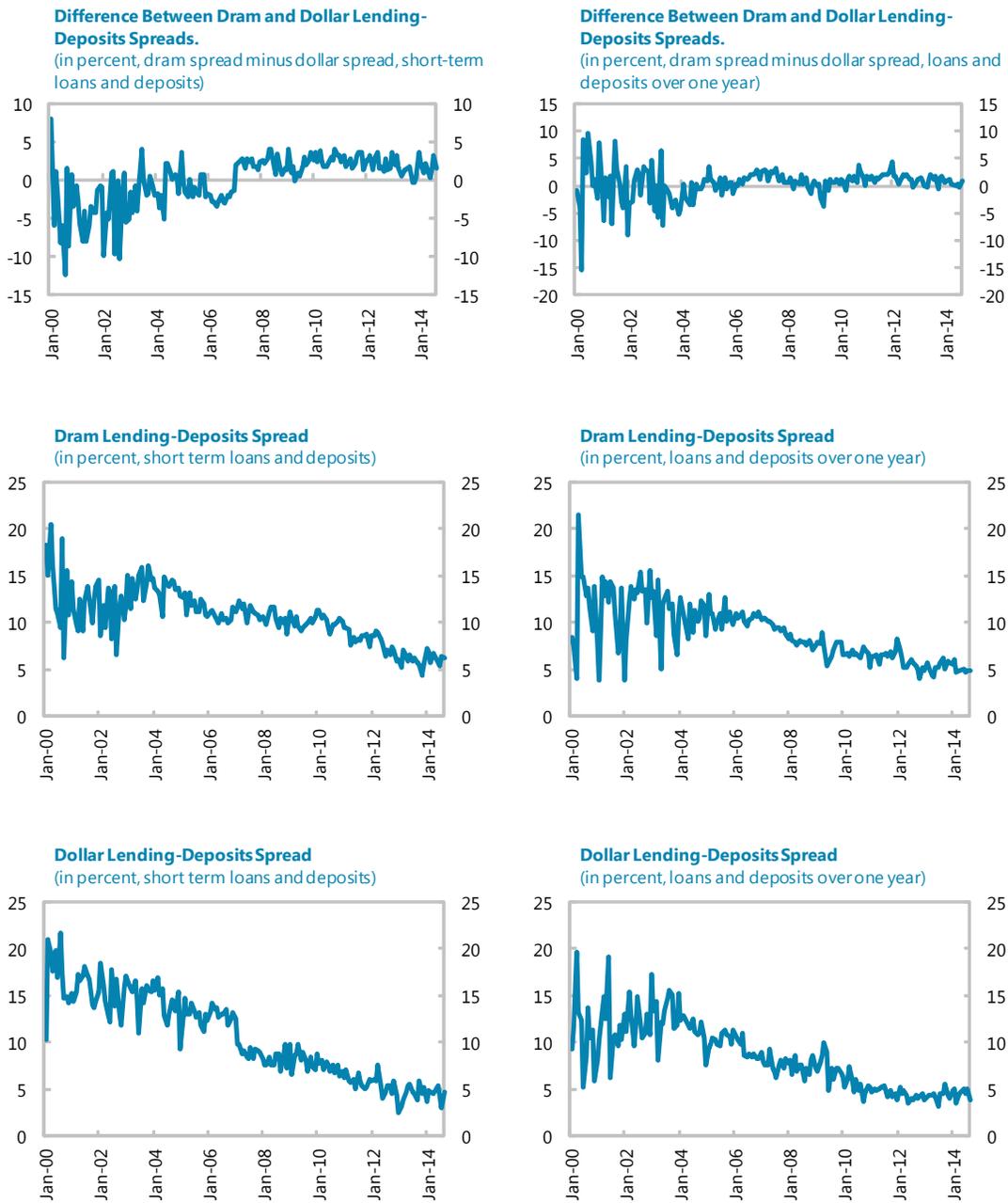
⁵ Another factor that may have contributed to the increase in credit dollarization was attempts by banks to bring the credit dollarization ratio closer to the deposit dollarization ratio after the big increase of the latter in 2009.

⁶ If prudential measures represent a high “tax” on financial intermediation in FX, then one would expect: (i) the interest differential of deposit rates (dram minus FX) to increase in response to prudential dedollarization policies; and (ii) the lending-deposit spread in dram to be lower than in FX—and, hence, the differential spread (dram spread minus FX spread) to be negative.

⁷ The only recent significant change occurred in 2007, with the elimination of FX consumer loans. As these were short term loans with relatively high interest rates, elimination reduced the dollar intermediation spreads and increased the spread differential for short term instruments (see top left and mid left charts in Figure 2).

⁸ While inflation averaged 5.4 percent between 2003 and 2013, it ranged from a low of -0.3 percent in 2005 to a high of 8.7 percent in 2010 with a standard deviation of 2.4 percent.

Figure 2. Armenia: Lending-Deposits Spreads, 2000m1–2014m9



Source: Central Bank of Armenia and Fund staff estimates.

Prudential regulation

- Armenia's strategy of relatively low RRs for FX liabilities, denomination of RRs in dram, and relatively low FX liquidity requirements in FX, may make the system vulnerable to FX liquidity shocks. In this context, the CBA's FX liquidity stress tests should remain an important input for financial supervision.⁹ An increase in FX liquidity requirements would address the concern of limited FX liquidity, and at the same time, contribute to dedollarization since it would reduce the profitability of FX assets. While the increase in FX liquidity ratios would likely face resistance from commercial banks due to its impact on profitability, there are some elements that facilitate its implementation. First, the CBA has recently reduced dram RRs, which supports bank profitability. Second, the implementation of Basel III guidelines implies an increase in overall liquidity ratios, which would be a good opportunity to also implement higher FX liquidity ratios.
- The CBA needs to continue monitoring currency mismatches of bank borrowers, as well as bank responses to regulatory changes. Regarding the latter, the fast growth of loans via FX credit cards that has occurred since 2009 is noteworthy and may have been a response to the elimination of FX consumer loans in 2007. Making sure that banks internalize the potential risks associated with these operations could also help reduce the risks of the system and support dedollarization. More broadly, strengthening the monitoring template for the assessment of unhedged borrowers should be a priority.

⁹ The 2012 FSAP Update found that while the system's foreign currency liquidity was above the minimum requirements for aggregate liquidity, foreign currency liquidity was unevenly distributed. In particular, 14 out of 21 banks had foreign currency liquidity ratios below the aggregate ratios.

Table 1. Armenia. Dedollarization Measures in Place, June 2014 1/

Category	Instrument	Measure	Comment
Macroeconomic policies and public debt management	Currency denomination of government domestic debt	Domestic government debt in Armenia is only issued in drams, although no legal restriction prevents issuance in foreign currency.	
Financial policy	(Dram) Liquidity management infrastructure and policies	Narrowing of interest rate corridor (around the policy rate) of the overnight interest rate, and credtion of new instruments for short term liquidity management (in progress)	
Prudential regulation	Rate of reserve requirements	A reserve requirement of 2 percent applies to banks' dram liabilities and a reserve requirement of 12 percent applies to dollar liabilities.	This measure is not uncommon and may have some positive aspects (e.g., can work as an automatic stabilizer when there are exchange rate movements). However, there are also some negative aspects. For instance, this measure could hurt efforts to dedollarize the credit portfolio: if balances in domestic currency have to be used to maintain reserves, then this encourages credit dollarization. In addition, bank profitability may suffer, as the cost of raising domestic currency liquidity is typically higher than the cost of raising foreign currency liquidity.
	Currency denomination of reserve requirements	All reserve requirements must be denominated in drams	
	Liquidity ratios	For assets denominated in foreign currency, the liquidity ratio of "highly liquid assets to total assets" has a floor of 4 percent, while the ratio ratio of "highly liquid assets to demand liabilities" has a floor of 10 percent. At the balance sheet level, the respective ratios are 15 percent and 60 percent.	Foreign currency liquidity ratios are less stringent than aggregate liquidity ratios, and, therefore, are unlikely to be very effective. This could leave to under provision of FX liquidity at the bank level and at the system level (not clear that the latter is the case in Armenia, since the system seems to have high FX liquidity).

1/ For comparability, the categories correspond with those identified in Kokenyne, Ley, and Veyrune (2010).

Table 1. Armenia. Dedollarization Measures in Place, June 2014 (Concluded) 1/

Category	Instrument	Measure	Comment
Prudential regulation (cont.)			
	Weights for credit risk calculation	Higher weights (indicating more risk) for a variety of foreign currency assets, such as claims on individuals and legal entities.	
	Net open FX position limits	A limit of 7 percent of capital applies on open foreign exchange positions on individual currencies, and a limit of 10 percent of capital applies on aggregate open foreign exchange positions on all currencies.	
	Coverage and payment of deposit guarantee	Bank deposits in domestic currency are covered up to 4 million AMD, while bank deposits in foreign currency are covered only up to 2 million AMD. All payments are made in AMD.	
Supervisory measures			
	Template on currency mismatches	Template to assess the extent of currency mismatches in banks' largest borrowers.	TA needed to improve the operational use of this template.
Forced dedollarization			
	Use of foreign exchange for payments and quoting prices	Prices of and payments for, goods, services, wages, and investments in statutory and share capital legal entities are quoted and made in drams only. Exceptions apply to (1) gifts, donations, and bequests; (2) noncash payments for non-trade delated transactions; and (3) noncash payments for current and capital account transactions among legal entities and sole entrepreneurs. Nonresident natural persons and residents are prohibited from using foreign exchange as a means of payment within Armenia.	
	Prohibition of especific forms of FX lending	Consumer loans can only be extended in drams.	

1/ For comparability, the categories correspond with those identified in Kokenyne, Ley, and Veyrune (2010).

Table 2. Armenia. Recent Dedollarization Policies, 2010–14

Instrument	Measure	Date	Comments
Reserve requirements (currency of denomination)	Reserve requirements against funds attracted in foreign exchange are established as 12 percent, of which 3 percent in AMD and 9 percent in foreign exchange	March 2010 (effective in April 2010)	Reserve requirements had been set at 8 percent for domestic currency liabilities and 12 percent for foreign currency liabilities in 2007, but the currency of denomination was the same as the currency of denomination of the liability.
	Reserve requirements against funds attracted in foreign exchange are established as 12 percent, of which 6 percent in AMD and 6 percent in foreign exchange	July 2010 (effective September 2010)	
	Reserve requirements against funds attracted in foreign exchange are established as 12 percent, of which 9 percent in AMD and 3 percent in foreign exchange	February 2011 (effective the same month)	
	Reserve requirements against funds attracted in foreign exchange are established as 12 percent to be reserved in AMD.	November 2011 (effective December 2011)	
Reserve requirements (rate)	Reserve requirement for dram liabilities reduced from 8 percent to 4 percent.	April 2013 (effective June 2013)	
	Reserve requirement for dram liabilities reduced from 4 percent to 2 percent.	February 2014 (effective March 2014)	
Weights for calculation of credit risk	Fifty percent additional risk weight for several categories of FX lending, including for loans classified as sub-standard and doubtful.	September 2010	
Minimum liquidity requirements for FX liabilities	For assets denominated in foreign currency, the liquidity ratio of "highly liquid assets to total assets" has a floor of 4 percent, while the ratio ratio of "highly liquid assets to demand liabilities" has a floor of 10 percent.	June 2012 (effective January 2013)	
Monitoring of currency mismatches	Banks to use a template to assess the extent of currency mismatches of banks' largest borrowers.	June 2012	

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FISCAL MULTIPLIERS IN ARMENIA¹

Fiscal multipliers are an important factor in economic policy design. This paper discusses approaches to gauging the size of fiscal multipliers in Armenia, including through estimation of a structural vector autoregression. The findings point to relatively high values of the multipliers, especially on capital spending.

- 1. With growth slowing down and continuing budget underspending, questions about the role of fiscal policy in stimulating economic activity in Armenia have become increasingly relevant.** More broadly, the fiscal strategy under the IMF-supported program aims to bolster growth in Armenia through higher capital and social spending, supported by higher tax revenues, ideally raised in a growth-neutral way by closing tax policy gaps and strengthening compliance. In the last three years, however, actual government expenditure fell short of the budget targets, largely driven by delays in the implementation of large infrastructure projects. In 2013 alone, the underexecution of the capital budget reached 48 percent (2.2 percent of GDP). While lower spending contributed positively to the significant fiscal adjustment in the period 2010–13, maintaining its current compressed level could be detrimental in the long run given Armenia's development needs. Areas where a more active government involvement would bring benefits to the economy include infrastructure (e.g., road and other transport improvements, or energy efficiency spending to reduce gas imports), healthcare and education, where spending in percent of GDP is below the average for selected transition economies (Tables 2A and 2B). Also, among peer countries, Armenia has the lowest ratio of total budget expenditure and ranks below countries with lower GDP per capita, as well as countries with less fiscal space (higher levels of public debt).
- 2. An increase in government expenditure would need to be accompanied by improved revenue collection in order to preserve macroeconomic stability.** In light of Armenia's relatively low tax ratio, the new IMF program under the EFF has placed the focus on revenue enhancement measures and improving of the composition of spending, including better remuneration for the public sector employees and implementation of major investment projects.² Determining the right mix of tax and expenditure measures, however, is a challenging task and a quantitative estimate of the likely effects of these measures would help guide policy decisions.
- 3. The effectiveness of fiscal policy as a tool to influence domestic demand has been subject to a long debate which typically centers on the size of the fiscal multipliers.** Interest in the topic surged during the recent crisis. However, there is little consensus on the precise relationship between fiscal policy and output, even in advanced countries where data availability is less of an issue. Estimates vary in a wide range, and the results are very much influenced by the

¹ Prepared by Rossen Rozenov (FAD) and Vahram Janvelyan (MCD/IMF Resident Representative Office).

² See IMF (2014).

methodologies used for identification of fiscal shocks and models estimation, as well as the sample periods covered. In addition, there is increasing evidence that multipliers vary with the business cycle. For instance, Auerbach and Gorodnichenko (2012) find large differences in the output response to fiscal policy changes in recessions and expansions with the response being larger in recessions. Following the observation by DeLong and Summers (2012) that in a depressed economy hysteresis effects may affect future potential output, attention is gradually shifting towards the long-term impact of fiscal policy on growth (see Dell’Erba et al., forthcoming).

4. Fiscal multipliers measure the effect on output from discretionary changes in taxes or government expenditure. Different types of multipliers are considered in the literature depending on the fiscal variables involved (tax or expenditure) and the specific time horizon of interest (multiplier on impact, peak multiplier, multiplier at horizon T, etc.).³ The size of the fiscal multipliers for a particular country at a particular time depends on a number of factors such as the policy instrument, the marginal propensity to consume and to import, the share of liquidity constrained households, the size of automatic stabilizers, the stance of the economy, monetary policy conditions, etc.⁴ For advanced economies, the first-year spending multiplier averages about 0.8 whereas the revenue multiplier is about 0.3 in normal times.⁵ For emerging markets and low-income countries, there is less information, but generally multiplier values are found to be lower, possibly reflecting, for example, that emerging economies are smaller and more open (with more leakages via imports).

5. Fiscal multipliers are hard to estimate econometrically due to reverse causation. Government expenditure tends to be procyclical, so it is difficult to distinguish between the case where spending causes output to change and the case where output affects spending. There are two main approaches to estimating multipliers. If sufficiently long time series are available with quarterly data, a structural vector autoregression model (SVAR) can be used. Alternatively, multipliers can be derived from a dynamic stochastic general equilibrium (DSGE) model, either estimated or calibrated to reflect the main features of the economy. If direct estimation is not feasible, a back-of-the-envelope method—a “bucket approach”—could be used. This note explores each of these methods and compares the results for Armenia.

6. Application of the “bucket approach” implies low to medium fiscal multipliers for Armenia. This approach is premised on the assumption that countries with similar economic conditions will have similar fiscal multipliers. The procedure comprises three steps.⁶ First, the country gets a score based on six structural characteristics (see Box 1). Second, depending on the score, the country is classified into one of the following categories: (i) low multiplier; (ii) medium multiplier; or

³ See Spilimbergo et al. (2009) for definitions.

⁴ Ibid.

⁵ IMF (2013a). Fiscal multipliers are reported here in absolute terms, i.e. they measure the effect on GDP in local currency units from a unit change in taxes or expenditure.

⁶ Ibid.

(iii) high multiplier. Finally, the multiplier range for each of these categories, which is based on empirical studies, is adjusted for the composition of the fiscal shock, the business cycle, and the monetary policy stance. Applying this methodology to Armenia suggests an intermediate case between “low” (0.1-0.3) and “medium” (0.4-0.6) multipliers in normal times. The results from the bucket approach, however, should be interpreted with caution. It is essentially a rule-of-thumb method that was calibrated largely on empirical evidence from advanced economies. While it can be used as a first approximation when no better data are available, judgment is needed to assess its relevance in each particular case. For example, a further upward adjustment in the multipliers (beyond the cyclical factors discussed in Box 1) would be justified if a large proportion of the economy is controlled by the government (see IMF (2013a)) which is sometimes the case in emerging markets and low-income countries.

7. Model-based simulations suggest that the first-year government spending multiplier is around 2. A small non-linear dynamic general equilibrium model calibrated to the Armenian economy is examined in Cincibuch et al. (2011). The model is mainly designed to trace the effects of changes in exogenous variables, which distinguishes it from linearized DSGE models, which are better suited for analyzing the volatility of endogenous data.⁷ Within this model, an illustrative fiscal policy shock in the form of a permanent increase in government expenditure by 5 percent results in an increase of output of about 2¼ percent in the first year. This finding suggests that a 1 percentage point increase in government expenditure gives rise to a cumulative increase in real GDP of 0.54 percentage points. Taking into account the share of public expenditure in GDP, this relationship translates into a spending multiplier in absolute terms of close to 2.⁸ As regards the revenue multiplier, the authors do not find any impact of revenue changes on output.

8. Econometric estimates of fiscal multipliers are typically obtained from VAR models. As noted above, the main challenge in modeling the response of the economy to changes in fiscal policy is the identification of shocks. Two identification schemes that are often used in empirical work are the recursive approach and the SVAR. The recursive method is based on the Cholesky decomposition of the covariance matrix of the model residuals and requires assumptions about the contemporaneous relations among variables, so that the ordering of equations is important. In contrast, SVARs rely on economic theory to resolve the issue of contemporaneous links. The identification strategy proposed by Blanchard and Perotti (2002) is perhaps the most widely used technique in fiscal policy SVARs.

9. Following Blanchard and Perotti (2002), we estimate a three-variable SVAR model for Armenia with net taxes, government spending and GDP. The model is estimated with quarterly

⁷ See Cincibuch et al. (2011) for a description of the model.

⁸ This estimate is significantly larger than the one suggested by the bucket approach. As pointed out above, it is important to keep in mind though that the bucket approach is based on a limited number of empirical studies (mostly for advanced countries) and may fail to capture country-specific circumstances. In contrast, the DGE model in Cincibuch et al. (2011) was calibrated to Armenian data.

data spanning the period Q1 1999-Q4 2013. Net taxes are defined as tax revenue minus subsidies and social transfers.⁹ Government spending comprises expenditure on goods and services and acquisition of non-financial assets (capital expenditure). All variables are expressed in real terms using the GDP deflator and are seasonally adjusted. We estimate the model with 4 lags in levels (logarithms) and add a linear trend and a dummy variable to account for a methodological change in the series since Q1 2008 related to the introduction of the GFS 2001 reporting standards.¹⁰ Figure 1 shows the dynamics of net taxes and spending on goods, services and capital as a ratio to GDP.

10. The identification technique exploits some specific features of fiscal policy. Blanchard and Perotti (2002) argue that output stabilization is rarely the main reason for government interventions, so that there are exogenous fiscal shocks. Also, due to decision and implementation lags, it is not plausible to expect a discretionary response to contemporaneous changes in output within a quarter. In the process of identification, institutional information on tax and spending programs is used to pin down two of the unknown parameters – the elasticities of taxes and of spending to output. In the absence of good estimates for these elasticities for Armenia, we assume a unit elasticity of taxes and zero elasticity for expenditure. These are both standard assumptions. In particular, given the flat VAT and CIT rates, and the relatively small progressivity of the PIT, the unit tax elasticity seems justified. Similarly, expenditures do not vary with output (there is no unemployment insurance and eligibility for family benefits is not related to output changes).¹¹

11. Results for Armenia indicate a relatively strong positive response of output to spending shocks in the first year. The structural impulse responses to shocks in expenditure and net taxes are shown in Figures 2 and 3, respectively. Output responds positively to a spending shock, albeit by a small amount initially. The peak effect occurs after three quarters and corresponds to a multiplier of about 1.4 (Table 1). Regarding the response of the economy to a change in net taxes, the SVAR estimates suggest virtually no impact on expenditure and a small negative effect on GDP initially. This effect becomes insignificant from the first quarter on.

⁹ Tax revenue includes social contributions which had been recorded as extrabudgetary social fund revenues till 2008 and were integrated in the personal income tax starting from 2013. Before 2012 the social contribution was a separate mandatory payment that had the all the features of a tax.

¹⁰ Unit roots test were inconclusive as to whether the data are trend stationary vs. difference stationary. For government expenditure, the ADF test rejects the null for a unit root at 1 percent, whereas for GDP and net taxes the null cannot be rejected at the conventional confidence levels. At the same time, the KPSS test does not reject the null hypothesis of stationarity for the revenue series. Given that unit root tests are known to have low power in small samples, and in line with most of the literature, we estimate the model in levels.

¹¹ The zero spending elasticity assumption is also made in Blanchard and Perotti (2002). Varying the tax elasticity between 0.8 and 1.2 did not have a significant impact on our estimates.

Box 1. The “Bucket Approach” Applied to Armenia¹

The first step of the bucket approach is to assign a score to the country based on selected characteristics that economies with large multipliers typically share (see table).

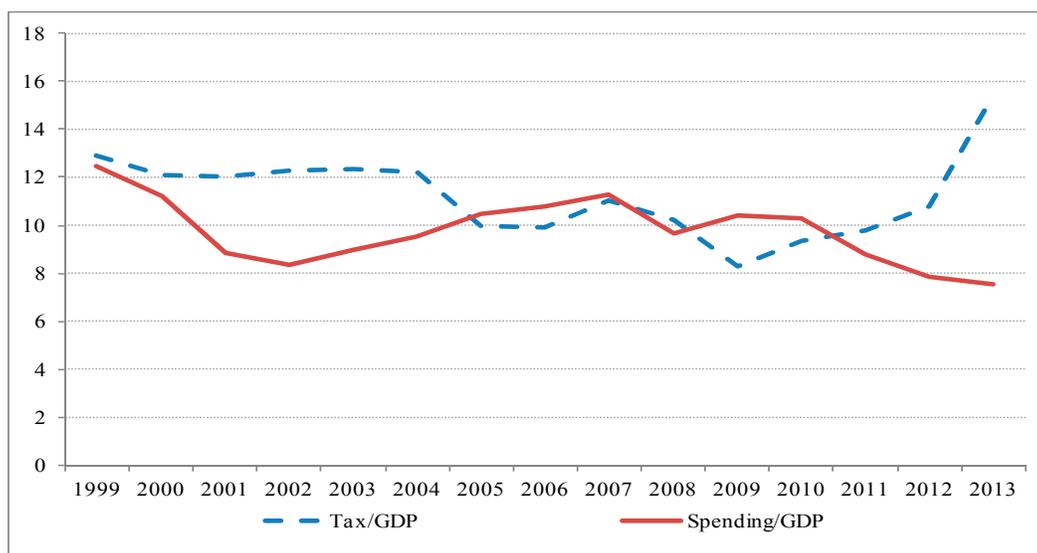
Structural characteristic	Indicator	Armenia’s score	Comments
Low trade openness	Ratio of imports to domestic demand below 40 percent on average for the last 5 years.	1	Imports of goods and services comprise 37 percent of domestic demand.
High labor market rigidities	Strong unions and/or strongly regulated labor market, e.g. rigidity index in the range of 0.8–1 as in Botero et al. (2004).	0	Employment law index for Armenia is 0.6 in Botero et al. (2004).
Small automatic stabilizers	Ratio of public spending to GDP less than 0.45.	1	The ratio of public spending to GDP in Armenia is about 0.25.
Fixed or quasi-fixed exchange rate regime	Assessment based on the Annual Report on Exchange Arrangements and Exchange Restrictions	1	Armenia has de facto crawl-like exchange rate regime.
Low/safe public debt level	Public debt to GDP ratio of less than 100 percent for advanced countries and less than 40 percent for EMs.	0	The public debt to GDP ratio currently stands at 43 percent.
Effective public expenditure management and revenue administration	On the spending side, assessment could draw on the Public Expenditure and Financial Accountability framework; on the revenue side, tax productivity could be used.	0	Armenia has low tax productivity compared to its peers.

Countries with scores of 0 to 3 are assumed to have low multipliers, those with scores of 3 or 4 are assumed to have medium multipliers and countries with scores 4 to 6 may be assumed to have high multipliers. (Some flexibility is allowed for countries in the medium range). The suggested values of the multipliers in “normal” times are in the ranges of 0.1–0.3, 0.4–0.6 and 0.7–1.0 for low, medium and high multiplier countries, respectively. With a total score of 3, Armenia is a borderline case between “low” and “medium” multiplier country.

For fiscal shocks that are entirely expenditure based, the above values should be adjusted upwards by 50 percent and for tax shocks a 50 downward adjustment should be applied. This is consistent with the empirical findings that spending multipliers are usually larger than revenue multipliers. Similar adjustments are proposed based on the economy’s position in the business cycle to reflect the growing evidence that fiscal multipliers are larger during recessions. Finally, if monetary policy is constrained, an upward adjustment of the multiplier by 10 percent is recommended.

¹ See IMF (2013a).

Figure 1. Net Taxes and Government Spending Ratios (percent of GDP)



Source: IMF staff calculations; spending refers to outlays on goods, services, and capital.

Table 1. Estimated Fiscal Multipliers from SVAR Model

Multiplier	On impact	After 1 year	After 2 years	Peak
Government expenditure	0.08*	0.89*	0.57	1.42*
Net taxes	-0.20*	0.41	0.42	-0.95

Note: The asterisk (*) denotes statistical significance at the 5 percent level.

Figure 2. Impulse Responses to a Shock in Government Expenditure

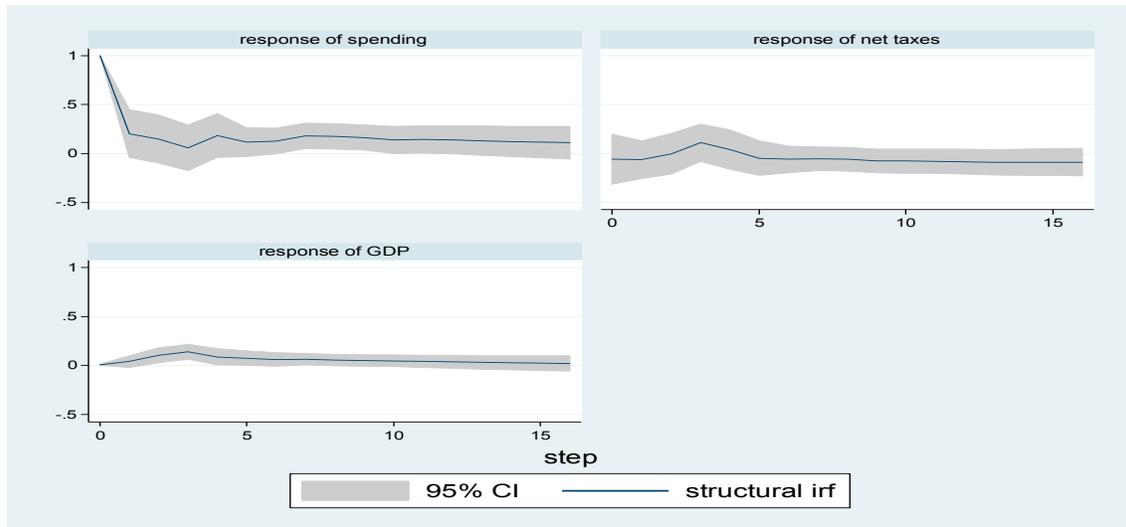
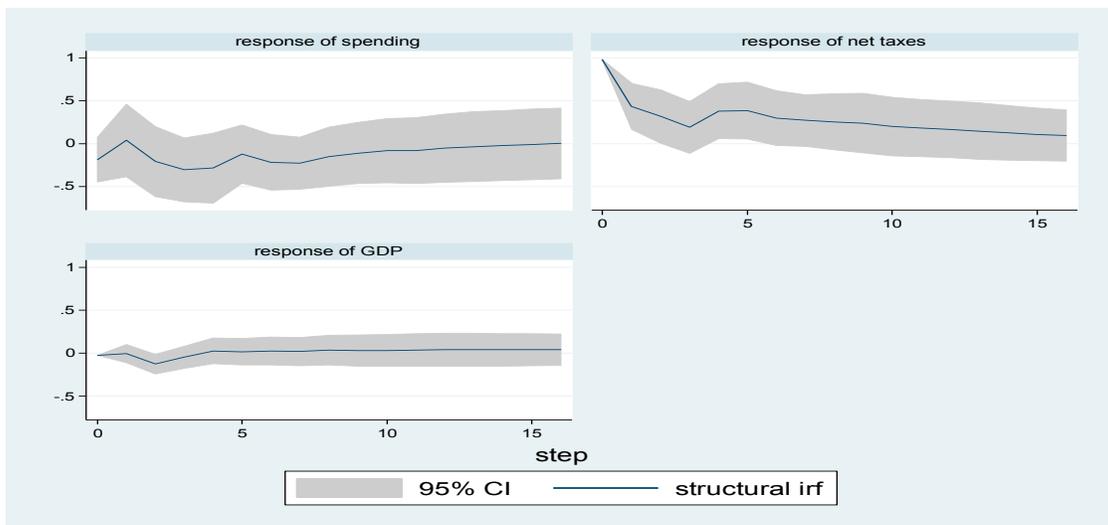


Figure 3. Impulse Responses to a Shock in Net Taxes



12. A comparison of the estimates for Armenia with findings for similar countries puts the results in context. Annex III in Batini et al. (2014) provides information on short-term fiscal multiplier estimates for a number of emerging market and low-income countries, including five former transition economies – Bulgaria, Croatia, Hungary, Poland and Romania. The spending multipliers for these countries range between 0.2 and 0.8, while tax multipliers are between 0.1 and 0.9. Similar values are reported for the Czech Republic where the short-term expenditure multiplier is in the interval 0.4–0.6 and the tax multiplier is between 0.1 and 0.3.¹² Overall, these values are lower than the first-year spending multiplier for Armenia calculated above, which is around 0.9. However, our estimates are broadly consistent with earlier findings that the Armenian economy responds relatively strongly to spending shocks and little to tax shocks (e.g., the spending multiplier of 2 based on Cincibuch et al. (2011)). There are several factors that could contribute to higher spending multipliers in Armenia. Among them are the lower savings rate, financial constraints (relatively weak financial intermediation and high cost of borrowing) which limit the consumption smoothing behavior, relatively low public debt (under 50 percent of GDP), and access to foreign budget financing.

13. Given the significant underexecution of the capital outlays budget in Armenia in recent years, it would be useful to have separate estimates of the multipliers by type of expenditure. One possibility is to use the same identification scheme as above in the SVAR framework and replace total spending with capital spending. The impulse responses obtained from this model are very similar to those in Figure 2, but the calculated multipliers are slightly higher: 0.21 on impact, 1.12 after one year and 1.64 in the peak which again occurs in the third quarter, compared to 0.08, 0.89 and 1.42, respectively for total expenditure on goods, services and capital.

14. In sum, the three methods for assessing the size of fiscal multipliers in Armenia point to diverse values. Application of the bucket approach implies low to medium multipliers but this method is based on other countries' experiences and does not reflect Armenian data. By contrast, the SVAR estimates and DGE model-based calculations indicate that the spending multiplier in Armenia could be higher than the typical values reported for less developed economies.

This result has important implications for the conduct of fiscal policy in Armenia:

- Fiscal policy can have a significant impact on output in Armenia and can be effectively used to provide short-term stimulus to the economy. The channels by which public spending affects growth include creation of additional jobs, purchase of domestic inputs (goods and services) and, in the case of infrastructure projects, elimination of bottlenecks and constraints to transportation and trade.
- The high capital spending multipliers highlight the importance of proper execution of a well-designed and well-targeted public investment program, especially during periods of growth

¹² IMF (2013b).

slowdown. For instance, if the capital budget for 2013 had been executed as planned, this could have added an additional 2.5 percentage points to growth based on the SVAR estimates for capital expenditures.

- A more active government involvement in infrastructure, healthcare and education, where spending falls behind the levels in other transition countries, could bring benefits to the economy. Increased expenditure, however, should take place together with improved revenue performance. Our results suggest that moderate tax increases are not likely to have a significant negative effect on output.
- Active consideration of fiscal multipliers would be useful for improving the accuracy of growth projections and the design of policy packages.

Table 2a. Composition of Public Expenditures by Functional Classification in 2012
(in percent of GDP unless noted otherwise)

	Health	Edu.	Economy	Social Prot.	Defense	Other expenditur	Total Expenditure
Albania	2.8	3.4	3.4	8.8	1.0	9.6	29.0
Armenia *	2.5	4.1	1.8	7.3	3.8	7.6	27.2
Azerbaijan	1.1	2.8	13.5	7.8	2.6	8.0	35.8
Belarus	4.1	5.4	5.7	13.0	1.0	12.0	41.2
Bulgaria	4.2	3.6	4.9	12.9	1.2	8.3	35.1
Czech Rep.	6.4	4.0	6.4	13.6	0.9	9.8	41.1
Estonia	5.1	6.4	4.5	12.6	1.9	9.0	39.5
Georgia	1.6	2.9	5.7	6.6	2.7	9.9	29.4
Hungary	5.3	4.8	6.2	17.1	0.8	14.5	48.7
Latvia	3.1	5.4	6.8	11.0	0.9	9.7	36.9
Moldova	5.4	8.4	4.3	13.2	0.3	8.6	40.2
Poland	4.6	5.1	5.0	16.1	1.2	10.1	42.1
Romania	3.1	3.0	6.2	13.6	0.7	10.0	36.6
Russia	3.5	3.9	3.7	12.3	3.0	14.9	41.3
Serbia	6.4	4.4	6.8	18.8	1.6	12.1	50.1
Slovak Rep.	7.5	5.4	3.2	14.2	1.0	7.1	38.4
Slovenia	7.0	7.2	5.4	18.9	1.1	11.0	50.6
Ukraine	4.2	7.2	4.4	13.3	1.0	18.1	48.2
AVERAGE	4.3	4.9	5.4	12.8	1.5	10.6	39.5

* Since data at the general government level by functional classification is not available for Armenia, the assumption is used that the difference between the total expenditures of general government and the central government could be attributable to health, education and other expenditures, that is local level governments' intervention is only in the specified areas. This is a reasonable assumption since the local authorities are not involved in defense spending and social protection, which are the other major categories of the state budget.

**Table 2b. Composition of the Public Expenditures by Economic Classification in 2012
(in percent of GDP)**

	Public Consumption	Fixed Capital	Social Benefits	Other	Total Expenditures	GDP per capita 1/	Public Debt
Albania	7.9	4.7	10.8	5.4	29.0	10154	62.4
Armenia	10.1	3.6	7.3	6.2	27.2	7418	38.9
Azerbaijan	5.8	13.4	5.5	11.0	35.8	16166	9.2
Belarus	16.1	4.2	12.7	8.2	41.2	17203	38.5
Bulgaria	12.3	3.0	14.7	5.0	35.1	15828	17.6
Czech Republic	6.7	1.9	18.3	14.3	41.1	26981	45.9
Estonia	17.6	5.4	12.8	1.1	39.5	24046	9.7
Georgia	9.6	4.7	7.1	8.3	29.4	6819	32.3
Hungary	17.5	3.3	17.8	10.1	48.7	22190	79.2
Latvia	12.1	3.7	10.4	10.5	36.9	21381	36.4
Moldova	18.7	3.6	12.6	5.4	40.2	4223	23.9
Poland	14.9	4.3	16.4	6.3	42.1	22350	55.6
Romania	15.9	4.8	11.8	4.9	36.6	17708	38.2
Russia	16.0	5.9	13.0	6.3	41.3	23504	12.5
Serbia	20.2	3.5	19.5	6.9	50.1	11801	61.8
Slovak Republic	10.9	3.4	18.7	6.5	38.4	25333	52.1
Slovenia	20.3	3.3	19.7	7.0	50.6	27915	52.8
Ukraine	18.9	1.3	17.8	10.0	48.2	8478	37.4
Average	14.0	4.3	13.7	7.4	39.5	-	-

1/GDP at purchasing power parity (current international dollars).

Source: Government Finance Statistics Yearbook (GFSY), World Development Indicators, Fiscal Monitor and IMF Staff Reports

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