# The Monetary Policy
# PROGRAM
# 2006
# of the Republic of Armenia

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# INTRODUCTION

The Monetary Policy Program has been prepared pursuant to the provisions of the Republic of Armenia Law on the Central Bank. It contains the following sections:

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The Central Bank of the Republic of Armenia (the CBA) is starting in 2006 to switch to a fully-fledged inflation targeting process. The main principles of this process have their reflection in the Program.

The sections that introduce individual sectors of the economy (except for the section *Monetary Policy*) provide generalized trends of basic macroeconomic indicators for 2005 and their respective forecasts for 2006. The bases for forecast and methodology are laid down in annexes, by respective areas. The monetary policy is presented in two sections. The first section gives a detailed analysis of the 2005 monetary policy indicators and trends, and reasons of departures of monetary aggregates from the program level as a precondition for a transparent monetary policy. The second section considers the usefulness to shift to a fully-fledged inflation targeting regime from the monetary policy's current strategy of monetary targeting[*]. The review also includes the 2006 forecasts of basic monetary indicators, the policy directions and the policy toolkit.

As the CBA is planning to launch a fully-fledged inflation targeting regime in 2006, the section *Inflation* provides a thorough account of forecasts for inflation and how likely will it fluctuate, based on the potential risks expected from different sectors of the economy.

Overall, the macroeconomic environment in 2006 will depict a picture as follows: economic growth will be 10%, according to the CBA forecasts; GDP deflator will beat the average annual consumer price index to 4%.

In the external sector, the share of current account deficit in GDP in 2006 is expected to be 3.8% compared with 3.2% in the year before. This rise will reflect surpassing growth in imports over exports, determined by high growth rates in capital goods in the structure of imports.

The state budget deficit in GDP will be 2.7%. Though the deficit is not high, conversion and spending at the CBA of large-scale FX funds (including the Lincy Fund resources) to be disbursed through the budget

[*] *The paper reasoning the adoption of the CBA's inflation targeting strategy is available at http://www.CBA.am*

will, however, draw an essential expansionary impact on monetary aggregates and inflation.

Given these developments in the macroeconomic environment and the need to end the year 2006 with up to 3% inflation target, dram broad money and broad money are forecast to grow by 27.0% and 17.3%, respectively, as opposed to the previous yearend.

The monetary policy will not seek maintaining such growth rates of monetary aggregates. Rather, aggregate demand will be regulated and inflation managed largely through interest rates of the CBA operations.

The inflation forecasts have been carried out using economic and mathematic models developed by the CBA. The inflation model that had been built in the previous year was made better in connection with switching to the inflation targeting strategy. This is based on differentiating goods in the consumer basket by price change patterns, and a choice of macroeconomic indicators to explain such changes. The forecast of inflation by the above methods suggests that reaching up to 3% inflation in the absence of certain risks in individual sectors of the economy is fully realistic.

# MACROECONOMIC ENVIRONMENT

***Economic growth and inflation***

Trends of economic upsurge over 2005 remained on record in terms of higher-than-expected economic growth, reduced current account gap in GDP and low inflation. Large amount of inflow of private transfers having contributed to rising household incomes has, along with foreign direct investment, resulted in certain appreciation of real and nominal exchange rates.

These developments in light of aggregate demand have resulted in elevated expenditures in the private sector, fuelling a notable increase in construction volumes. Good weather, too, has contributed to growth rates in agriculture, helping to produce a suppressive effect on price level.

The fiscal policy over the year has left a slight expansionary impact on aggregate demand, partly determined by 1.3% share of the budget deficit in GDP.

Under these conditions the CBA was pursuing the strategy laid down in the monetary policy program (maintaining up to 3% inflation).

Therefore, the economic growth is expected to beat the projected figure to 11.3%[1], with an inflation indicator making up around 0.5% at yearend. That said, the average inflation will be 0.5%. GDP deflator, highly influenced by the recorded rise in price in industry and decreased deflator in agriculture, will end up reaching 4.2%.

The main trends in the macroeconomic environment developments are expected to persist over 2006. External financial inflow will continue, however with slower growth of private transfers, which would induce a slowing private consumption. Instead, an increase in gross investments is anticipated, mainly due to a notable increase in public investments owing to grant funds expected from the Lincy Fund during 2006. As a result, the state budget policy will have an expansionary impact on aggregate demand.

The CBA is therefore projecting 10.0% economic growth[2] and up to 3% inflation for 2006.

***Aggregate supply***

The real growth of production output in almost all sectors of the economy over 2005 will be higher than projected, pushing the economic growth to exceed the program indicator by 3.3 pp. Capital construction will report the highest growth.

Industry has reported certain increase in production output whereby the real growth of value added will be 6.3%, with 1.2 pp. contribution to the economic growth against 0.4 pp. in the previous year. About 40% real growth in the metallurgy industry has been the primary contribution to the industrial output growth, with the metallurgy share to increase by 7 pp. and reach 20%. Since the output of the mentioned sub-branch is completely exported, the volume of export of finished goods has increased concurrent with the production growth. Gas supply market will also report

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[1] *The 2005 annual indicators are the CBA estimations based on the January-September and January-November 2005 actual data.*

[2] *For the economy's 2006 real growth estimation, see Annex 3.*

a considerable growth due to robust gasification throughout the country. Meanwhile growth rates of food production somewhat slowed because of sluggish pace of growth in production of alcohol.

It is anticipated that the growth in the industry over 2006 will persist owing to both increasingly dynamic metallurgy and expected outside investments in the food and chemical industries that would slightly push up their productivity. In 2006, 6.4% real growth of value added in industry is anticipated, whereby the contribution to the economic growth will be 1.2 pp.

Good climate in 2005 fostered an abundant harvest from vegetables, whereby agricultural value added will grow in real terms by 8.4%, contributing to the economic growth by 1.9 pp.

Considering that productivity does not seem to rise in the agriculture yet, and the increase in output is conditional on either weather conditions or extensive growth, the real growth of agricultural value added in 2006 will be 4%, with 0.8% contribution to GDP growth.

Growth in constriction notably quickened largely due to enlargement in capital construction funded by the households and firms. Rising domestic savings fuelled by increased external investments and household incomes essentially promoted such an enlargement. Value added of construction will therefore beat the projection to reach 30.5%, contributing to the economic growth by 4.7 pp.

In consideration of inflow of the Lincy Fund resources, which the Republic of Armenia Law on the State Budget 2006 envisages to use mainly for construction of roads and social entities, and given a long-term profile of ongoing capital construction (most construction projects are planned for a two/three-year timeframe), the sector will tend to grow over 2006, with the growth of value added to be 20.0% and contribution to the economic growth by 4 pp.

The year 2005 recorded a considerable progress in services, with the second mobile phone operator having entered the market since July. Competition in this market segment has pushed service fees notably down and increased the volume of services. However, growth of trade and transport services somewhat slowed. As a result, the growth of value added of services will be 8.7% compared with 12.5% in 2004, while contribution to GDP growth will be 3 pp.

Certain growth of investment in services (communications, hotels & resorts, and transport) over 2006 is anticipated. In a medium-term perspective, this will promote increased productivity of other sectors of the economy. In real terms, value added of services over 2006 is expected to rise by 10%, contributing to the economic growth by 3.2 pp.

In 2005 net indirect taxes also grew, attributable to sustainable economic growth and increased imports. Real growth of net indirect taxes will be 6.3%, contributing to the economic growth by 0.5 pp. In 2006 net indirect taxes in real terms will grow by 9%, with 0.7 pp. contribution to GDP growth.

***Aggregate demand***

High economic growth recorded in 2005 will be maintained largely owing to increasing domestic demand. High growth rates of private sector expenditures will persist as the growth of public expenditures were less dynamic than foreseen. Growth of private expenditures will be 10.5% versus public sector expenditures' 6.9%.

The year 2005 will see high growth of private consumption and investments, determined by continuously rising household income and large-scale inflow of private transfers and foreign investments. Concomitant with the rise in household income, growing financial intermediation will further fuel private consumption's real growth of 7.7% which partly will reflect an increase in consumer loans by about 50%.

Increased foreign direct investment and the investment financed by domestic savings will boost the growth of private investments by 22.8%, which will be directed mainly to the areas of construction, industry and services. Interestingly, most of these investments relate to new technologies and equipment, which is a key requisite for increased effectiveness of economic activity.

Growth of private sector expenditures over 2006 is expected to somewhat slow as there will be a slowdown in growth rates of consumption and investments. Private consumption will increase by 7.4% and private investments by 12.9%[3].

In 2005 public sector has been more inactive than foreseen, in terms of fostering the aggregate demand. Growth of public consumption for the year will be 10.9% while investments will decline by 3.5%. Under-performed public sector expenditures for the year were mainly caused by shortages in disbursement of external funds, PIUs in particular.

Conditional on expected disbursement of funds from the Lincy Fund (about US$ 30 million) and PIU funds over 2006, public spending will contribute to the growth of aggregate demand at a higher rate, growing by 18.3%. That said, public investments will rise by 58.4% and be used in road, social and housing construction. A 5.1% growth in public consumption will be directed largely to the education and research areas.

In 2005 growth of exports by 10.6% will be a contribution to aggregate demand growth, largely determined by increased exports of base metals and prepared food. Where the growth of exports of base metals was attributable to outside factors owing to rising external demand for them, the main factor promoting exports of the prepared food was the heavy harvest of fruits and vegetables, which the agricultural processors benefited from in terms of reduced price for raw material and an opportunity for exporting.

Growth of investments, increasingly seen recently, has found a reflection in the structure of imports and notably promoted the acceleration of imports. Particularly, growth of imports by 10.7% for the year will be determined mainly by increased imports of investment goods and raw materials.

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[3] *Indicators of growth in the section Aggregate Demand refer to the real growth.*

***GDP deflator***

The year 2005 will see GDP deflator reach 104.2%, with prices in construction and industry notably rising, and wholesale agro-product prices falling.

Among sectoral deflators, the growth of GDP deflator in construction will hit a record high – 15%, determined by about 21% increase in wages in that industry. Prices of industrial output kept on going up, as has been the case in the last two years. The industrial output price-rise of 10.3% over the year originated from about 44% rise in prices in base metallurgy due to ascending prices in international market of base metals. The sale prices on agricultural products dropped by 4.3% compared with 5% growth in 2004, determined by wholesale fruit and vegetable prices dropping as a result of heavy growth of gross plant vegetation.

The indicator of consumption deflator that has a big share in GDP will fall by 0.7 pp. vis-á-vis the previous year's indicator, due largely to low sale prices on agricultural products. Concurrent with this, growth of capital investment deflator will be 12.4% owing to high construction costs which is determined by both an increase in wages and the demand factor. With the dram appreciating and surpassing growth of dollar prices of exports, the goods and services exports deflator will grow by 5.7% while the imports deflator will drop by 10%.

GDP deflator over 2006 is expected to reach 104%[4]. The construction deflator indicator will be 103.5%, considering that prices in the sphere are subject to adjustment at certain intervals of time and the 2005 take-off adjustment the next year will not recur. Value added deflator of industry will ascend by 6.6% owing to higher production costs of building materials, which is determined by increasingly broadening demand for building materials as a result of high growth rates in construction volumes. In the first months of the year, certain rise of prices is anticipated in the base metals market. In the last months, however, the prices will tend to decline. Agro-product sale prices will rise by 4.9% determined by low level of prices of agricultural products in 2005 and resultant demand-driven growth of prices.

Consumption deflator will be 103.0% attributable to anticipated levels of average annual inflation and sale prices of agricultural products that are included in the calculation of the deflator. Capital investments deflator, as derived from construction deflator, will be 103.5%. Based on the expectations about appreciation of the dram over 2006, export and import deflators were envisaged to be 93.4% and 95.9%, respectively.

[4] *The estimation method is provided in Annex 3.*

# FISCAL POLICY[1]

The development trends in Armenian economy inherent in recent years have been visible over 2005, too. Recorded economic growth and volumes of external turnover of commodities over the nine months of the year have exceeded the projections. This dynamism has affected the collection of taxes, having helped to generate more taxes than had been projected. Based on the 2005 results, tax revenue is expected to exceed the program level by 1.2%. Over 2006, the collection of taxes[2] will be conducive too, as the above-noted developments of 2005 are expected to continue.

Over-performance of taxes over 2005, like in previous years, has not been concomitant with the retaining of the program share of taxes in GDP: the annual taxes/GDP ratio in 2005 is expected to be 14.3% against the program 14.7% under the Republic of Armenia Law on the State Budget 2005. Naturally, a low level of this indicator suggested producing smaller share in GDP projected by the medium-term expenditures program for social spending.

With nominal growth rates of GDP and taxes running the same pattern as in 2005, the tax sensitivity[3] indicator will also retain the same level to make up 1.1%.

In the structure of tax revenue in 2005, the share of taxes on imports slightly reduced to about 40% from 42% in the year before. For comparison, whereas taxes on imports over the nine months of the year have increased by 11%, tax revenue has grown over the same period by 18.4%. However, high growth was reported on profit tax as it has 1.6 times as much exceeded the previous year's indicator for the same period.

Certain shifts in the structure of tax revenue are expected over 2006 as a result of increasing share of direct taxes and decreasing share of indirect taxes. In 2006 direct taxes will constitute 22.4% of tax revenue against 19.1% in the year before and 19.6% in 2004. In 2006 indirect taxes will constitute 61.9% of tax revenue as opposed to the previous year's 64.6% and 64.1% in 2004. Plans for 2006 include generating 21.2% growth for direct taxes and 14.7% growth for indirect taxes in relation to 2005.

On the whole, the 2006 budget revenue will have contractionary impact on aggregate demand, which will be 0.3%, according to the calculated fiscal impulse indicator. Given the [expected] level of the 2005 revenue, as mentioned above, the revenue impulse will draw neutral impact.

The execution of the budget expenditures over the nine months of the year, as opposed to the collection of taxes, has been implemented under disproportionate allocation of expenditures. Meanwhile, the budget practiced some savings of expenditures that resulted in certain deviation from the quarterly programmed proportions. These two factors have always been in accompany with the performance of the budget in the recent years

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[1] *The 2005 and 2006 RA consolidated budget's preliminary indicators and those of defined by the RA Law on State Budget serve a basis for this section.*
[2] *The tax revenue indicator in this text includes State Budget's tax revenue and duties together.*
[3] *Calculated as a ratio of percentage changes of tax revenue and GDP.*

and caused accumulation of funds in the Treasury Unified Account (TUA). This delivers an evidence that there are problems in the projection of tax revenue and expenditures of the budget that considerably affected implementation of monetary policy programs. Further, it reflected the deviations, occurred almost in all months, in projected and actual flows relative not only to the state budget but also to the communities and the pension fund. As a result, during the year, the level of TUA has been above the indicator of quarterly proportions for 2005, as set by the Government program.

Preliminary program indicators of the budget suggest that TUA funds will slightly plummet in the fourth quarter to about AMD 40 million at the end of the year (an arrival of facility under the Poverty Reduction Strategic Program, PRSP, included). In the event AMD 13 billion[4] spending from the 2006 TUA is provided for the year and given that such a high level of resources would persist, it may be expected that the budget performance will have seen the previous trends demonstrating the same issues. Conversion of external funds[5] of the budget and disbursements from TUA over the year will raise the indicator of monetary base by about AMD 40 billion.

As the CBA is planning a change, starting from 2006, in the monetary policy strategy by turning from the monetary targeting to an inflation targeting regime (by taking a forecast level of inflation as a nominal anchor and an intermediate target), a supply of accurate information on flows of the fiscal sector becomes more important. It would allow more operative adjustments of monetary and fiscal policy programs and a better evaluation of fiscal factors affecting prices, through an exact matching of the program and actual figures.

In expectation of undertaking resolution of issues that are prioritized by PRSP and Medium-Term Expenditures Strategic Program, the Armenian consolidated budget's expenditures policy in 2006 will be directed to increase expenditures in GDP by 1.6 pp. compared with the previous year, with capital expenditures to be the largest contribution to such an increase (by 1.5 pp.). In 2006 the nominal growth of budget expenditures [with the resources of the Lincy Fund] is planned to reach 23% (that figure was expected to be 15.7% in 2005). Growth of current expenditures over 2006 will be 13.1%, growth of capital expenditures, 64%. In 2005 these figures were 17.5% and 8.7%, respectively.

In 2006 budget expenditures will have expansionary impact on aggregate demand: it will be 1.5% according to the fiscal impulse indicator. In 2005 impact of budget expenditures on aggregate demand was somewhat expansionary which, the fiscal impulse indicator denotes, will be 0.4%. So, with the budget revenue having drawn contractionary impact and expenditures having drawn expansionary impact on aggregate demand

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[4] *The indicator shows as grand total of AMD 3.0 billion of item 'Free Balances at the Beginning 2006', and AMD 10 billion of item 'Proceeds from Privatization of State Equity in Commercial Firms', in domestic sources of the RA budget deficit financing, as laid down in the RA Law on State Budget 2006.*

[5] *The calculation includes the Lincy Fund resources (AMD 12.6 billion), disbursements from privatization proceeds (AMD 19 billion, from Special Account), a grant (AMD 12 billion), external (net) financing of deficit (AMD 1.2 billion, excluding PIUs), disbursements from TUA (AMD 13 billion), and other FX expenditures of the budget (around AMD 15 billion).*

over 2005, the fiscal impulse indicator will be 0.4% expansionary. The fiscal sector's impact on aggregate demand over 2006 will be expansionary, with the calculated impulse indicator to be 1.2%.

In view of the above-mentioned proportions of the budget revenue and expenditures in GDP, the budget deficit/GDP ratio in 2006 will be 2.8%. The expectation of the ratio for 2005 is 1.3% instead of the projected 2.3%. In 2006 external sources of financing will constitute 43.9% of the budget deficit financing (the projection for 2005 was 70%). The growth of share of domestic sources of deficit financing over 2006 will largely depend on disbursement of AMD 29.3 billion from privatization proceeds (dram and foreign currency entries from privatization), which has not been planned in the year before.

The coordination of the fiscal and monetary policies over 2005 was afoot as earnings from an additional issuance (AMD 11.5 billion for the nine months of the year) and sales of securities by the Ministry of Finance and Economy of the Republic of Armenia (MoFE) were deposited with the CBA and own securities of the CBA had been allocated since July. Though this was a step forward in terms of liquidity management, but as the annual deficit is financed from the proceeds of the sale of securities yet limited to the budget, redemptions of these securities at yearend will be problematic and may question the continued effectiveness of the liquidity management.

The above activities in the Armenian securities market have been accompanied with falling government securities interest rates in the recent years. Interest rates of securities allocated in 2005 averaged 5.1% compared with 7.3% in the year before. Meantime, however, the maturity of government securities allocated over the nine months of the year has increased to 900 days against the previous year's average 826 days.

In 2006 net income from allocation of government securities is planned to grow by AMD 7.0 billion, a small amount in light of such a growth of budget expenditures, high frugality and planned growth of broad money. In a situation like this, the anticipation in 2006 is that the maturity of government securities will increase and low, yet steady, interest rates will persist.

As well as in 2005, the public debt will decrease in 2006 to be acceptable enough for sustainability, according to the methodology of calculation of debt sustainability, published by the CBA. The debt/GDP ratio in 2006 will be 23.6% (28.6% in 2005). There will be positive shifts in certain indicators relating to debt sustainability: the burden of debt service will diminish over 2006 as a result of reducing interest payment (a rescheduling of some external non-privileged loans).

To sum up, under the inflation targeting regime, the right warranty for an effective implementation of the fiscal and monetary policies over 2006 would depend on improved quality of policy programs, flexible and operative adjustments, and the transparency provision of these programs.

# EXTERNAL SECTOR[1]

***General trends***

Anticipated slowing of the world economy, high prices on oil and non-ferrous metals, and persistent growth of the Armenian economy will determine the developments in the external sector over 2006.

In the external sector of the Armenian economy, the 2004 developments persisted largely throughout 2005. The current account deficit kept on reducing to US$ 153.2 million from the previous year's US$ 161.6 million in absolute value and to 3.2% from the previous year's 4.5% as a share in GDP. Like in the previous year, considerable inflow of private transfers and factor incomes contributed to the abatement of the current account deficit, the growth rates of which slowed in comparison with the previous year but still reported as high a level as 32.5%. It is noteworthy that in 2005 growth of exports and imports of goods quickened considerably and the deficit of balance of services shrank notably. High international prices of metals fuelled growth of exports, which explained a marked growth of exports of "Non-precious metals and articles". Growing imports were largely determined by increasingly sustainable demand in the recent years. As a result, growth was recorded on almost all commodity types. The abatement of the negative balance of services was largely a result of growing exports of services, particularly, tourism, communications and information technologies. In 2005 the capital and financial account more than twice as much outstripped the current account deficit, enabling an essential increase of foreign reserves of the CBA. In 2005 Armenia's terms of trade improved by 14.9% against the previous year. With these flows, the Armenian dram continued to appreciate against the US dollar throughout 2005.

The expected developments in external sector in 2006 will differ to some extent from the last two years' trends. The current account deficit is expected to reduce by US$ 77.3 million to US$ 230.5 million in absolute value and by 0.6 pp. to 3.8% as a share in GDP. This will be attributable mainly to higher growth of imports in relation to exports and slowing growth of private transfers and factor incomes compared with the previous year. It should be noted that no further mark-up over 2006 is anticipated in the world metal market, but prices on certain metals (copper and molybdenum, in particular) would rather seem to decline to some extent, determining slowing exports for Armenia. High growth rates of imports over 2006 too, will be a result of continued increase in incomes as well as determined by imports of machinery and equipment for a number of investment projects in Armenia. That said, the resources expected to arrive under these projects would notably be more than the previous year's respective indicator.

The capital and financial account in 2006 will behave somewhat differently than in the year before, as direct investments and capital transfers are expected to grow considerably owing to investments in

[1] *The 2005 BoP indicators are the CBA estimations based on actual indicators of the first six months.*

Armenia by some enterprises for re-equipment of production capacities, and capital transfers disbursed by the Lincy Fund under a new investment project. It is expected that, as a result of the above-mentioned flows, the 2006 capital and financial account will outstrip the current account deficit, and that the reserves of the CBA will grow.

***Current account***

Though the balance of trade deficit grew in 2005 in absolute value (by US$ 105 million) to US$ 563 million, it however reduced considerably in GDP by 1.2 pp.

In 2005 the growth of export of goods (Credit) quickened notably compared with the previous year and made up 33.4%, and 48.1%, without account of "Precious stones and metals" (exports totaled US$ 985.1 million). High growth of exports was enhanced by 126% growth of "Base metals and articles thereof", owing to a 25% rise in price of copper and almost twice as much rise in price of molybdenum in the world market. Item "Precious stones and metals" grew by 19% and item "Products of prepared food" by 28%.

Export of goods in 2006 is expected to increase by 12.2% to US$ 1106 million (Annex 6.1). The 16% growth of "Base metals and articles thereof" will contribute remarkably to this growth, explained by activation of new production capacities in this market other than the rise of prices of metals in the international markets. Item "Products of prepared food" is expected to grow by about 12% (owing to increased production volumes of brandy) in which inequality by types of goods and country is still intensive. Sub-item "Alcohol and non-alcohol drinks", in which brandy enjoys a large share and for which Russia remains the main destination of export, is prevailing in that group. In the event incomes in Russia continue to increase, as they had tended previously, one may reckon that Armenia would continue to benefit the significance of that market. Export of "Precious stones and metals" in 2006 will increase by 9% mostly owing to faster growing import of raw material and reserve accumulation in the previous year. Certain shifts were made in the structure of exports: whereas the growth of total exports in the period 2001 – 2003 was largely due to the growth in jewelry and diamond sectors, growing output of metallurgical and ore and mineral enterprises have since 2004 contributed to the exports growth.

The import of goods (Debit) in 2005 accelerated as well, compared with the previous year, making up 29.4%. Consistently growing household income and exchange rate appreciation on the one hand, and investment projects implemented for re-equipment of production capacities of some enterprises on the other, have contributed to such a growth. In 2005, as opposed to exports, volumes of almost all groups of importables grew. Imports have grown mainly owing to increasing volumes of "Precious stones and metals" (28%), "Mineral production" (32%), "Transport means" (61%), "Machinery and equipment" (40%), and "Products of prepared food" (36%). While the growth of "Products of prepared food" and "Transport means" was fuelled by rising household income, the

growth of "Precious stones and metals" was determined by the importing of rough diamond, and the growth of "Machinery and equipment", by investments fostering enlargement of production capacities at metallurgical plants. The indicator "Mineral production" has risen as a result of increased import prices in dollar terms, determined by added imports of fuel and gas in particular, and climbing world prices on petroleum.

The CBA estimates that import of goods in 2006 will grow by 16.4% to US$ 1802 million (Annex 6.1). Factors affecting the imports will remain to be the previous year's trends, namely continuously growing household income will shape an appropriate demand for import. Further, imports will be fostered by some industrial enterprises undertaking the import of investment goods. This indicator will exceed the previous year's indicator, with a growth rate amounting to 37.5% and being faster than the growth rates of consumer goods and raw materials that will make up 19.7% and 12.8%, respectively. The growth of imports by groups of commodity will be determined largely by the increasing imports of "Products of prepared food" (20%), "Mineral production" (13%), "Machinery and equipment" (38%), and "Transport means" (18%).

With the exports and imports demonstrating such a performance (growth rate of imports will outpace that of the exports by 4.2 pp.), the balance of trade deficit will increase by US$ 133.7 million to US$ 696.8 million. Its share in GDP, however, will remain almost unchanged making up 11.6%, since the growth of the balance of trade deficit in 2006 will be close to the growth rate of GDP in dollar terms.

External turnover in 2006 will grow by 14.8% to US$ 2907.9 million. However, its growth rate will lose 16.2 pp. to the previous year's indicator due to slowing exports and imports compared with the year before.

Attributable mostly to the growth of export of services, the balance of services in 2005 improved considerably and totaled US$ 52.7 million (1.1% of GDP) against the previous year's US$ 70.7 million (2.0% of GDP). Fast growing exports of tourism, communications and transport and information technologies were the main contribution to the growth of export of services [export of services grew faster than the import, making up 23.3%]. The import of services in the meantime has increased by 12.4% largely owing to tourism and transport services.

The balance of services deficit is expected to somewhat increase over 2006 to US$ 58.1 million, with its share in GDP remaining, however, almost unchanged compared with the previous year, to make up 1%. The growth of export of services will slow a little against the previous year to make up 15%, partly determined by slowing growth of transport services in connection with export of goods. In the meantime, it is expected that the previous year's trends of growing export of tourism and information technologies will persist. The growth rate of import of services over 2006 will come in slower than that of the export and will make up 14.3%. The growth of import of services will be attributable to growing transport and tourism services that will be enhanced by the expected high growth rates of goods imports and household incomes.

The indicator "Net factor incomes" in 2005 grew by 124% to US$ 82.2 million mainly as a result of 20% increase in the wage from the contract employment, determined by the rising incomes of Armenian people who are engaged in the non-tradable sector of the Russian economy (Annex 6.4). Net payments against investments over 2005 decreased as earnings on the management of foreign reserves increased.

The indicator "Net factor incomes" over 2006 will grow by 33.6% owing to the rising of incomes from work carried out by residents abroad. This will be notably affected by the economic developments in Russia and international oil prices[2].

Current transfers in 2005 increased by 15.1%, with the private sector grown by 20% and the public sector declined by 6.9%, to US$ 380 million. Increased incomes in the non-tradable sector of the Russian economy had a considerable contribution to the growth of private transfers (Annex 6.4).

According to the CBA forecasts, the growth of current transfers over 2006 will somewhat slow compared with the previous year, to 9.0%, with the private sector growing by 12.5% and the public sector declining by 11.3%. Current transfers in nominal value will be US$ 414 million. Presumably, the previous year's trends would continue to take hold in the Russian economy over 2006 – world prices of fuel would heighten the export volumes of Russian fuel, the prices and incomes in the non-tradable sector and would make the real exchange rate to appreciate. Growing incomes earned by Armenian people in the Russia's non-tradable sector would result in the growth of private transfers to Armenia.

***Capital and financial account***

The growth of net inflow of the capital and financial account in 2005 was 82.4% (US$ 156.4 million), impressive enough in comparison with the year before, with the net inflow of capital from the rest of the world having amounted to US$ 346.2 million. Direct investments grew by 1.5% or US$ 3.1 million to US$ 219.7 million[3] thanks to privatization of the Kajaran Copper and Molybdenum Plant. Net inflow of public loans grew by 18.3% or US$ 12.7 million[4]. Net foreign assets (NFA) of commercial banks decreased by US$ 39.1 million, as opposed to the previous year's increase of US$ 30.5 million, since banks started using a new regime of reserve requirement of keeping FX reserves against FX funds [instead of the prior regime, whereby they used to keep required reserves only in drams against FX funds], and because dollar loans originated by the banking system to the Republic of Armenia residents increased. The private sector's expenditures were US$ 32.4 million which has been directed to finance the current account deficit.

Foreign direct investment in the capital and financial account over 2006 will rise by 4.7% (US$ 10.3 million) to US$ 230.0 million that is

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[2] *In January-September 2005, Russia's share in the structure of non-trade assets received via the banking system was around 80%.*

[3] *The growth in 2005 was 27.6% or US$ 51.1 million excluding US$ 31 million direct investments under a 'Property Against Debt' arrangement with Russia.*

[4] *The repayment of the debt to Russia of US$ 31 million under a 'Property Against Debt' arrangement with Russia has been netted against the 2004 indicator of public debt repayment.*

explained by the enhancement of production capacities of some enterprises and implementation of several construction projects in Armenia, whereas the growth of foreign direct investment in 2005 was largely determined by privatization of a major plant in the mining industry. So, exclusive of the 2005 privatization proceeds from the total direct investments, the growth of direct investments in 2006 will be 35.5%. The Lincy Fund is expected to launch new projects that would push capital transfers to increase 1.6 times or by US$ 19.0 million to US$ 50.0 million.

Public loans in net volume will drop by 11.4% against the previous year to US$ 73.0 million explained by reducing volumes of the attracted loans and augmenting funds for repayment of loans. In 2006 it is planned to attract US$ 90 million external public debt. The repayment of external loans will amount to US$ 17 million.

In 2006, with the inflow of capital, the private sector will accumulate considerable FX funds more dynamically than the growth of inflow, which would push net inflow of the capital and financial account down by 8.9% to US$ 315.3 million, against the previous year[5]. However, if the economy continues to see the dram being replaced by foreign currency, the CBA will further absorb 'extra' cash foreign currency in the market. As a result, the CBA's foreign assets will increase instead of huge accumulation of FX assets in the private sector.

NFA of commercial banks are expected to diminish by US$ 8.5 million determined by attraction of external loans by non-residents and growth of FX loans which the banking system makes available to the Republic of Armenia residents.

As a result of the balance of payments flows, the capital inflow over 2006 will exceed the current account deficit by US$ 84.8 million, resulting in replenishment of gross foreign reserves of the CBA to US$ 780.6 million. FX funds received through the CBA will exceed the CBA repayments of the external debt (interest payment included). This, along with other operations by the CBA, will replenish gross foreign reserves of the CBA by US$ 69.3 million. Under such conditions, the import coverage indicator will fall to 4.2 months against 4.5 months in the year before, attributable to an expected faster growth of imports. The CBA NFA will grow over 2006 by US$ 84.8 million to US$ 581.0 million (the KfW funds included).

***External debt***

Plans for 2006 include attracting external public loans of US$ 107.5 million, of which US$ 87.9 million are the loans to the Government and US$ 17.4 million are the IMF and KfW loans to the CBA. External debt servicing (including servicing on the CBA loans and the Government-backed loans) will amount to US$ 60.7 million, of which US$ 50.2 million is the payment on the principal and US$ 10.5 million represents interest payments. The prevailing part of the installment payment will be disbursed by the IMF loans, the repayment of which will be US$ 32.8 million.

In 2006 Armenia's external public debt under such flows (including government guarantees) will total US$ 1215.9 million against US$ 1161.1

[5] *The accumulation of FX funds by private sector in the capital and financial account is recorded in the line "Other private sector" by the sign 'minus'.*

million in the year before. Privileged loans will prevail in the structure of loans attracted, constituting 99.0% in total loans against the previous year's 98.1%. The net present value of external debt in 2006 will be US$ 775 million against the previous year's US$ 738 million. In recent years, the indicators of external debt have performed considerably well which will carry on over 2006, owing to high growth rates of GDP, goods and services. The external debt/GDP ratio in 2006 will be 21% compared with the previous year's 24%, and the external debt service/GDP ratio will be 1.0% compared with the previous year's 1.4%. The external debt service/export ratio in 2006 will be 4.1% against 5.1% in the year before, owing to high growth of export of goods and services.

***Real effective exchange rate and external trade prices***

The CBA forecasts that the real effective exchange rate over 2006 will appreciate 7.5% against 8.2% in 2005 (Annex 9 and 6.2)[6].

Average inflation in Armenia over 2006 will be 2.1%; average weighted inflation in the partner countries will be 6.2%, mainly attributable to the impact of inflation in Russia and Iran, which will be 2.1 pp. and 2.0 pp., respectively. Expected indicators of inflation in these two countries over 2006 will be 10.7% and 18.5%, respectively.

The Armenian dram's nominal effective average exchange rate will appreciate over 2006 by 11.9%. Average weighted depreciation of currency in the partner countries will be 2.9%, where the impact of 3.9% appreciation of euro vis-á-vis US dollar will be felt more, which will be 1.2 pp. The average exchange rate of the Armenian dram vis-á-vis US dollar has been computed as a residual (the forecasted amount of the real exchange rate minus Armenia's inflation, change of forecasted inflation and exchange rates in the partner countries)[7]. In fact, the nominal exchange rate of the Armenian dram vis-á-vis US dollar is not a forecast, unlike the real effective exchange rate, but serves just for calculation. So, the average annual appreciation of the Armenian dram vis-á-vis US dollar will be 9.0%[8].

Other scenarios for real and effective exchange rates are possible, too. This will largely depend on to what extent key variables (exports, imports, private transfers, financial and other capital flows, world market prices) deviate from the projections, and on performance of economic indicators in the partner countries. If the programmed level of inflation in Armenia persists, the nominal exchange rate will incur the impact of these developments, which implies that the nominal exchange rate would depart from the above-mentioned scenario.

The terms of trade of the Armenian economy over 2006 will deteriorate by 2.6% (after a record improvement of 14.9% in 2005) determined by expected faster growth of import prices versus export prices (Annex 6.3).

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[6] *For real exchange rate forecast methodology, see analysis of results of the use of model, Annex 9 "Change in wage, production and prices under terms of trade".*

[7] *In preparing the Monetary Policy Program, the nominal exchange rate has been used in calculations for comparison of financial flows.*

[8] *The formula of nominal effective exchange rate calculates the value of 1 AMD in US dollar, whereby appreciation is 9.0% as opposed to the calculation of the value of 1 US dollar in dram, whereby the US dollar depreciation vis-á-vis Armenian dram is 8.3%.*

The growth of export prices in dollar terms in 2006 will be 2.0% in comparison with 22.1% in 2005, of which consumer goods prices will increase by 4.9, intermediate goods prices will decrease by 1.0%, under steady prices of investments goods and diamond.

The impact of the partner countries' inflation on 4.9% growth in prices of export of consumer goods over 2006 will be 6.7%; the impact of exchange rates depreciation -1.7%. Of partner countries, the impact of Russia will be 4.6 pp., the euro-zone's -0.4 pp. and the USA's 0.7 pp.

Anticipated 1.0% drop in prices of export of intermediate goods over 2006 will be explained by falling prices of base metals (impact of falling price of molybdenum making up 2.9 pp., and impact of falling price of copper 0.5 pp.), which will be partly offset by rising gold prices (impact 2.2 pp.).

The rise of dollar prices of imports over 2006 will be 4.8% compared with 6.2% in 2005. Prices of intermediate goods will go up by 6.0%, prices of petroleum by 13.9% and prices of consumer goods by 3.2%, whereas prices of investment goods, diamond and natural gas will remain unchanged.

The 3.2% rise of prices of imported intermediate goods over 2006 is explained by the impact of inflation (5.1 pp.) and exchange rates depreciation (-2.5 pp.) in the partner countries. Prices rose mostly by the impact from Russia (1.9 pp.), Ukraine (0.7 pp.) and Iran (0.6 pp.), while the euro-zone impact on the average depreciation of the euro exchange rate will be -0.5 pp.

Expected 6.0% rise of prices of imported intermediate goods over 2006 will be attributable to a mounting gold price, whereas no change in price of grain is anticipated.

The performance of the petroleum price over 2006 is particularly worth mentioning. The IMF experts estimate[9] that an average international price of oil per barrel in 2006 is expected to be US$ 61.75, a 13.9% increase against 2005. This estimation is underpinned by an assumption that throughout 2006 a barrel's price would be retained on the level recorded at the yearend 2005, which is also expected to be around US$ 61-62. The idea of mismatch between growing demand and limited supply underlies the assumption. Restriction in supply is explained by both less possibilities for exploration and commissioning of new oil supplies and 'bottlenecks' of transport and oil reprocessing infrastructures. That said, long-term forecasts in the oil market suggest that prices will keep on rising and that the era of 'easy oil' is over.

[9] *IMF, World Economic Outlook, Sept., 2005*

# DIRECTIONS AND TRENDS OF MONETARY POLICY IN 2005

The main directions set out in the monetary policy program 2005 provided that the CBA had planned a policy aimed at ensuring stable prices, while continuing its strategy of monetary targeting. Expected demand for money over the year was estimated based on a consideration to create a monetary environment conducive enough for attaining a forecast 8% economic growth and a low, up to 3% inflation. The year's characteristic features that were to reflect persisting growth of lending to economy, enhanced confidence in the dram and higher-than-projection economic growth were taken into account. The Republic of Armenia law on Currency Regulation and Currency Control and a final introduction of the individual deposit guarantee scheme since July 2005 would promote the widened circulation of the dram. Nonetheless, these factors in the Program 2005 were viewed as risky because some greater demonstration of them during the year could have been possible. In such circumstances, the CBA was envisaging a revision of programmed monetary (especially dram) aggregates, aiming to expand these more.

Dram broad money was planned to increase by 15.5% as of the yearend 2005 and by 17.9% on average, annually, while monetary base would have to grow by 8.9% and 13.6%, respectively. In 2005 the CBA also envisaged that foreign currency deposits would grow by 21.7% whereby broad money would have grown by 18.5%, as of the end of period, and by 26% on average, annually.

The choice of toolkit of the CBA was deriving from expected autonomous flows (mostly from budgetary spending) and the risks associated with these flows that were largely vectored to an even more expansion of monetary base. That is to say, the use of the dram absorbing tools during the year would have been more proactive.

Actual results of the past nine months show that several risks provided for in the annual program have behaved in that period. Given an extensive inflow of foreign currency, the dram pursued a steady path of appreciation that had fostered revival of the dramization since the beginning of the year. It reflected the record growth of dram component in broad money, as dram broad money at the end-September has grown by 50.5% whereas this growth indicator for the same period in 2004 was a mere 3.2%.

Mounting demand for the dram was displayed through both currency in circulation and dram denominated deposits having increased in September 2005 by 42.4% and 68.2%, respectively, versus the same period of 2004 (in 2004 – by 6.4% and -3.1%, respectively).

Slowing growth of foreign currency deposits in relation to the previous years better highlights the phenomenon of currency substitution. The FX deposits in September 2005 increased by 12.1% compared with the same period in the year before, against 41.9% in 2004.

As a result of the above-mentioned structural changes, broad money in September 2005 increased by 31.2% compared with the same period in the previous year, against 19.6% in 2004.

According to supply components and determined by factors fostering growth, broad money in 2005 increased as a result of replenishment of external reserves of the banking sector (owing exclusively to the CBA). Under a huge inflow of foreign currency, the CBA has executed purchase operations in the FX market to moderate steep appreciation of the dram and tailor the demand for money, consistent with the volumes of currency substitution. As a result, NFA of the banking sector in September increased by 35.2% compared with 7.4% in September 2004. NFA of commercial banks in September 2005 decreased by 29.5% against an increase of 32.6% in September 2004. This is an evidence that banks are increasingly beginning to allocate resources in the Armenian economy.

It has also reflected in the performance of the indicator of lending to the economy. Lending in September grew by 26.8%, compared with the same period in 2004 (against 42.6% in the year before). Although lending in 2005 slowed against the previous year but, determined by the effect of currency substitution, growth rates of dram loans accelerated: in September, the growth made up 52.6% against the same period in the previous year (44.9% in the year before). The same factor determined the slowdown of growth rates of FX loans, to 14.9% (42.5% in the previous year). However, high growth rates of household lending, 43.7%, persisted, signaling a buoyant consumer loan market.

Government liabilities to the banking sector in September 2005 reduced by 34.3% against the same period of the previous year (9.1% in 2004), largely due to a conduct, since the beginning of the year, of restrictive fiscal policy through under-executed budgetary expenditures and over-performed taxes. At the same time, banks notably stocked up their government securities portfolios by buying Treasury bills, which were additionally issued for dram excess liquidity absorption.

Other items net of the banking sector decreased during the year by 33.9% in September 2005 against the same period in the year before, largely determined by commercial banks having earned profits and replenished the statutory fund.

In 2005 banking intermediation somewhat rose, which was reflected in the performances of both monetization and dramization coefficients and dram multiplier. The monetization and dramization coefficients in September 2005 increased by 13.2% and 26.3%, respectively, determined by broad money and dram broad money having grown faster than the real growth of the economy.

Dram multiplier grew in September 2005 by 1.8% versus the previous period in review while money multiplier fell by 6.9%, yielding to projected growth rates. The raising of reserve requirement to 8% from a previous 6%, with a new stipulation that the funds attracted should be kept in the same currency, other than in the dram, added a serious influence. Huge excess of dram resources that were released consequently

curbed the growth of multipliers considerably. As for money multiplier, it decreased due to slower-than-projected growth of FX deposits.

Determined by the same factors, money velocity and dram velocity reported slowdown, by 14.8% and 21.7%, respectively.

Based on the results of the first half 2005, the macroeconomic and monetary environment has seen the dram continuously appreciating and the demand for money steeply growing, as was set out in the annual program. In such a situation, as monetary indicators markedly deviated from the program having, nevertheless, not led to essential inflationary pressures (semiannual 1.5% inflation instead the program 4%), the CBA revised the program level of monetary indicators in the second six months of the year, in consideration of implementing more expansionary policy. According to the revised program, the main directions of which had been communicated to commercial banks at the beginning of the second six months, the CBA was planning to end the year with 41.4% growth of monetary base versus 8.9% projected originally and with an average annual growth of 35.4% against the projected 13.6%.

Keeping on prioritizing its key objective and consistent with a process of currency substitution since the beginning of the year, the CBA broadened money supply further than it was programmed. In September 2005 monetary base grew by 52.3% compared with 10.4% in the year before. The purchase of foreign currency served to be the primary instrument to satisfy tremendous demand for money. The choice of this instrument was to ease to some extent the impact of large-scale FX influx in the market.

In 2005, as opposed to the year before, the CBA had no fears that the annual inflation indicator would outstrip the program level and that it would largely have to withhold an enlargement of supply of money in order to offset vast FX influx. What’s more, the results of the past nine months appoint to created deflationary environment, reporting 3.6% deflation (against the projected 0.4), with deflation of 0.5% in September compared with the same period of the previous year (against the projected 2.8% inflation).

Taking these factors into account, the CBA has, by use of an FX purchase instrument, injected more than AMD 40.0 billion-worth liquidity over the past nine months. The changed regime of reserve requirement and the raised ratio, introduced in the middle of the year, also pursued an offset of the huge FX inflow. So, AMD 12.0 billion liquidity formerly comprising the reserves against attracted foreign currency resources turned to be excess, effective the 10-th of June.

In consideration of the deflationary environment and the need to alleviate appreciation of the dram, the CBA offset only part of the excess dram by use of absorbing instruments, such as reverse repurchase agreements and deposits, and newly introduced financial instruments (depositing with the CBA of proceeds from additional issuance of government securities by the Government and issuance of CBA securities).

In this period of time, the CBA initiated a conclusion and re-conclusion of about AMD 6.0 billion reverse repurchase agreements for the entire portfolio of Treasury bills.

In 2005 banks were proactive in resorting to the standing deposit facility which, it seems, helped handle the allocation of a short-term (1-2 weeks) dram excess.

Before the issuance of own securities of the CBA, the mechanism of depositing the proceeds from issuance of Treasury bills with the CBA has been actively used through which AMD 12.0 billion liquidity has been absorbed over the nine months of the year.

For the first time on June 10, 2005 the CBA issued its own securities for up to 1 year of maturity which enabled to absorb AMD 13.5 billion liquidity in the period June-September.

The increasing demand for money affected growth rates of currency outside the CBA. Cash in September 2005 grew by 25.3% against the beginning of the year and by 43.5% against the same period in the year before. This perhaps is the main indication of dramization of the economy.

The year 2005 was momentous also in terms of pretty high levels of excess reserves of the banking sector. The results of the past nine months show that the average monthly excess liquidity amounted to AMD 12.3 billion as opposed to AMD 4.4 billion in the previous year.

Macroeconomic and monetary trends in the past couple of years herald a breach in stability of demand for money. In recent years, the demand for money incurred influence of external factors and, consequently, impact of supply shocks. All this made it difficult for the CBA to make forecasts of the demand for money and, accordingly, manage the supply of money. Based on these arguments, the CBA has embarked on preparing for an inflation targeting policy since the second half of the year.

# INFLATION

The monetary policy implemented by the CBA in 2005 pursued maintaining an up to 3% inflation indicator that was consistent with medium-term program provisions. Under such conditions annual inflation should have averaged 2.2%.

Inflation in 2004 was low, at 2%, and in preparing the 2005 monetary policy program, a likelihood of high inflationary expectations was not considered since a high inflation indicator over one year could not essentially cause creation of such expectations.

Other peculiarities of the year included the inflation – exchange rate dilemma that had been eased enough in comparison with the previous year. Under high dollarization of the economy, the appreciation of the dram exchange rate did not lead to a demand for dram initially but partly became a stimulator to growth of demand for foreign currency resources. The slowing growth of dram deposits in relation to foreign currency deposits was an indication of this. Further appreciation of the dram over 2005 strengthened the enlargement of dramization of the economy and growing demand for the dram. So, broadening by the CBA of supply of money further than the projection, which the monetary policy program considered to be likely too, did not create inflationary pressures during the year, meantime relieving appreciation of the dram.

In 2005, risks anticipated from all sectors of the economy largely showed up. Particularly, higher-than-projected economic growth, higher-than-expected growth of transfers and exports generally contributed to the expansion of aggregate demand and, therefore, affected consumer prices to go up.

The fiscal sector had contractionary impact, against the projection, as a result of over-performed collection of taxes and under-executed expenditures.

In a price-formation process, the impact of supply factors behaved as follows:

- With higher-than-projected economic growth, growth of real wages surpassed productivity (22.3% and 10.2%, respectively), which caused creation of upward pressures on prices. Agricultural product reported high growth rates of 9% against the program 5.5% in the period January-September. Given quite a large share of agro-products in the consumer basket, fast growing supply of these products exerted notable constrictive impact on inflation.
- The impact of developments in the fiscal sector on inflation was contractionary as the net indirect taxes/GDP ratio in 2005 was 8.3% compared with 8.7% in 2004.
- Expected appreciation of the dram, which was considered in the 2005 program and had taken place during the year, placed a suppressive impact on the growth of prices. The appreciation directly reduced the prices of imported goods in the consumer

- The impact of change in administrative prices on inflation was generally neutral.

In the outcome of these developments in aggregate demand and supply, the 12-month inflation in October 2005 was -0.5%. Inflation at the end of the year is expected to be around 0.5%, with the average annual inflation to be around 0.5%.

In 2006 too, the monetary policy of the CBA will pursue up to 3% inflation. This target was set owing to the Armenian economy having been in a low inflationary phase in recent years.

Because the CBA is planning to launch, effective 2006, a widely practiced inflation targeting strategy, improving the inflation forecasting methods and models is critical.

The monetary policy program was prepared using macroeconomic indicators such as dram broad money, economic growth, etc., that were calculated within a financial programming and then applied in forecasting an inflation indicator. While switching to the inflation targeting regime, the forecasts of monetary aggregates will be much more of indicative nature, and changes in them will mostly depend on the need to ensure a program target of inflation. Inflation forecasts were made using economic and mathematic models developed by the CBA (P-Star Model based on the quantitative theory of money, Annex 10; the impact of change of terms of Armenia's foreign competitiveness on prices, Annex 9, and the fiscal theory model of prices, Annex 11). Inflation forecasts for 2006 were made through statistical methods as well, Annex 13.

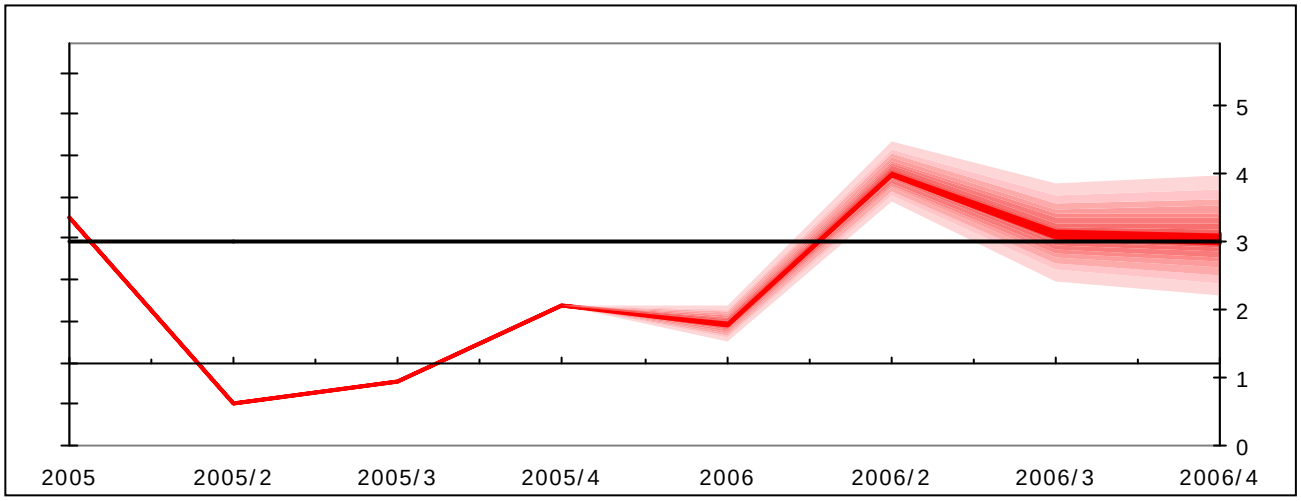
The inflation model, Annex 12, built in the previous year got some improvement during the year. The model included new variables that explain how the inflation behaves and a more detailed analysis and breakdown of consumer basket by type of goods. The breakdown was made using the results of segmentation (sectors, imports or domestic productions) of goods and of comparative analysis of their price change. The model put together not only likely impacts of aggregate demand and aggregate supply affecting inflation, but also analyzed their long-term and short-term impacts on inflation. In forecasting the inflation for 2006, consideration was given to the changed structure of demand for money in 2005, having been reflected through a currency substitution effect. Depending on further developments in the macroeconomic environment over the year, several variables under the CBA's direct and indirect oversight (monetary aggregates, interventions) can be changed within the model, which will result in managing the inflation in compliance with the program.

By the usage of the inflation model, the CBA analyzed also the risks expected from the macroeconomic environment, their likely impact on inflation and the probability as to what extent it would sway up and down

the projected level. A chart below illustrates the distribution of probabilities of forecast values of annual inflation[1].

The diagram in the chart is slightly bent upward, indicating prevalence of the risks that inflation would outstrip the program. Another indication of upside risks is that each interval situated above the central target scenario (the darkest interval) is wider than the respective interval of the same tint below.

Chart 1.




The table below presents the relative probabilities of how the annual inflation, which is calculated through the probability density function, would appear in different intervals:

| **Inflation** | **Up to 1%** | **1% - 2%** | **2% - 3%** | **3% - 4%** | **4% - 5%** | **Over 5%** |
|---|---|---|---|---|---|---|
| Probability | < 1 | 10.7 | 36.8 | 37.5 | 12.7 | 1.4 |

The risks that may emerge in ensuring the inflation target are presented by individual sectors of the economy, as follows:

***Real sector***

In the real sector, one can note possible slowdown of growth rates of agricultural product that may give rise to pressures pushing the program indicator of inflation to outpace. The emergence of such a risk is possible in consideration of the real high growth of agricultural product in 2005 as fruits and berries in January-September have grown 4.5 times. Because good climate has largely contributed to such heavy crops last year, it is estimated that the growth of agricultural product in 2006 could be lower from the expectation, creating pressures in the consumer market and pushing prices up. The latter is viewed as a shock of aggregate supply, and, in a short-run, the monetary authorities perhaps cannot control its possible impact on inflation. In some cases, it is

[1] *The method of building the chart of distribution of probabilities of forecast values of annual inflation is published in the CBA newsletter, Q3, 2002.*

even not advisable. This is why, certain central banks exercising inflation targeting regimes point to an indicator of core inflation, rather than general inflation, which rules out a change in prices of agricultural product. This risk is important also because both the inflation indicator and its fluctuation in previous years have been largely attributable to behavior of prices of agro-products (meat and meat foods, fruits and vegetables).

Inflation may also incur an expanding impact from higher-than-expected growth of wages in the economy. The likelihood of such a growth may be attributable to persisting downward trends in unemployment and mounting demand for qualified workforce, concomitant with high economic growth in recent years.

In view of restricting impact on inflation, higher-than-expected productivity growth is a highlight, which will foster a rise in prices in a long-term perspective but will suppress the inflation indicator in a short-run.

The last two factors refer to unit labor costs. The CBA estimates that the risk of growth of productivity prevails over the first one, and the possible impact of unit labor costs' deviation from the forecasted level on inflation will be restrictive.

***External sector***

In the external sector in 2006, the most important risk that may produce divergence in the smooth implementation of the monetary policy program is exacerbation of the current account deficit. This may curb the pace of exchange rate appreciation and put an expansionary impact on inflation. More-than-anticipated aggravation of current account deficit is possible when the below factors show up as follows:

- A fall in international prices of metals over 2006 that would considerably reduce proceeds from exports, hence deepening the deficit of trade and current account balance;
- A likelihood that the value of imports could be greater than anticipated. That is possible if the inertia of demand created as a result of high economic growth and increased private transfers and incomes in recent years lasts longer than considered in the monetary policy program;
- Another risk is associated with slowing growth of private transfers from abroad (mainly Russia) and income volumes, as in 2005 such growth already slowed down versus 2004. Particularly, slower-than-expected growth of international oil prices over 2006 will bring about plunging incomes in Russia, thus resulting in reduced private transfers and incomes received from that country which constitutes a considerable share in the structure of total transfers and incomes.

Certain improvement in current account deficit over 2006 may occur due to high growth or even accelerating growth of private transfers and incomes.

But the first scenario of further exacerbation of current account deficit that would preclude the pace of exchange rate appreciation and draw an expansionary impact on inflation is more likely to happen.

Though international oil prices recently tend to go somewhat down due to diminished speculative demand and strengthening US dollar in the world financial markets, growth trends in a long-run are however possible, in which case rise of prices will presumably resume. This point of view is supported by the fact that there are inconsistencies in world supply and demand and reprocessing capacities, which is impossible to work out in a short-run. If such a scenario takes place it would result in an increase in prices of petroleum in Armenia, placing an expansionary impact on inflation.

Given the developments in the fuel and energy market and recent statements uttered by the Government of Russian Federation the price of natural gas in 2006 may rise essentially, placing an expansionary impact on inflation.

The risks associated with exchange rates in partner countries mostly refer to possible fluctuations of the euro/US dollar exchange rate as EU countries have the biggest share in the structure of external trade of Armenia, and exchange rates of most partner countries will incur its concrete impact (British pound sterling, Swiss franc, Russian ruble, etc.). Overall, there is risk that in 2006 euro would depreciate vis-à-vis US dollar more than projected in the monetary policy program. This thought may receive support from a circumstance that key US economic indicators, economic growth in particular, are higher than those of EU countries. This creates possibilities for the Federal Reserve System to raise interest rates in order to curb inflation. Whereas, the European Central Bank has yet to pay attention to the EU economic growth, somewhat weak at the moment, which withholds it from moving interest rates up and further encumbers to do so. All this will entail a widening gap between the US and EU interest rates that may trigger a capital outflow to the US and depreciation of euro. The latter will, all else being equal, draw a restrictive impact on inflation in Armenia as prices of consumer goods imported from EU countries and other countries would reduce.

***Monetary and financial sector***

Estimated growth of monetary aggregates for 2006 is consistent with projected up to 3% inflation indicator. The CBA has also estimated the risks of deviation of monetary aggregates, both upward and downward.

The risks that monetary aggregates would outgrow may show up mainly in the event of executing net expenditures over AMD 40 billion, as provided for by the CBA estimations[2]. As it is, that can be concurrent with additional disbursements under the Millennium Challenges program. It may well be that banking sector loans to the economy outstrip the projected levels. In this situation, to prevent an undesired steep rise of market interest rates, there will be limitedness for the CBA to absorb

[2] *Spending of US$ 30 million out of US$ 60 million grant of the Lincy Fund, as laid down in the RA Law on State Budget 2006, is reckoned by the CBA to be realistic.*

excess liquidity over the year. As a result of this, growth rates of monetary aggregates would exceed the projections, producing extra inflationary pressures.

The risks that monetary aggregates would decrease also derive from the above-mentioned factors. That is to say, under-execution of budgetary expenditures that has been the case in the recent years and a slower-than-expected lending to the economy from the banking sector is possible, which will give rise to lower monetary aggregates.

The CBA estimates that the first direction out of the mentioned ones should prevail over the year, and pressures of monetary aggregates on inflation will be mostly expansionary.

Material deviations of annual performances from quarterly proportions of the Armenian budget in recent years could be another factor of riskiness. Such deviations have existed during all quarters in the last years, and no positive moves in 2005 in respect of remedying such deviations have been in place. Presumably, the deviations would persist over 2006 too, noticeably causing difficulties in ensuring a projected indicator of inflation.

# MAIN OBJECTIVES AND DIRECTIONS OF MONETARY POLICY IN 2006

***The strategy of the monetary policy***

Effective January 1 2006, the CBA will launch an inflation targeting strategy, a new way to handle inflation, instead of the policy of monetary targeting.

The monetary targeting strategy, which the CBA adopted in 1994, suggests determining an end-target for inflation and then setting an intermediary target or, which is the same, a nominal anchor to achieve the end-target. In implementing this strategy, money supply or broad money, which the CBA manages by means of the operational target i.e. monetary base, is normally accepted as a nominal anchor. So, whereas the chain of monetary base – broad money – inflation works, the CBA ensures money supply based on the money demand forecasts (depending on income, GDP deflator, and the previous year's indicator of demand for money).

The strategy of monetary targeting since the second half of 1994 has enabled the CBA to reduce and stabilize the pace of inflation. Inflation in the period 1998-2004 has averaged 2.4%. Generally, the CBA has succeeded in maintaining stability by managing monetary aggregates albeit various external and internal shocks occurred during these years.

Nevertheless, a successful continuation of the strategy depends on a handful of circumstances.

First of all, *existence of a firm relationship between inflation and monetary aggregates* is needed to make sure that a target indicator of monetary aggregates leads to a target indicator of inflation. Otherwise, where monetary aggregates repeatedly deviate from the target for the reason to fulfill the primary objective of maintaining stable prices, the monetary policy programs published by the CBA lose their credibility.

The next important precondition is *possibility of a full management of monetary aggregates* by the CBA. The CBA effectively manages the indicator of monetary base but faces difficulties in handling broad money. At present, demand for money in Armenia has a low degree of predictability because of a weak relationship between monetary aggregates and inflation, fluctuating demand for money and low elasticity of dependence on interest rates, external shocks, material impact of non-monetary factors on inflation, and noticeable changes of the level of dollarization. What is more, structural changes in the Armenian banking sector, high growth rates of lending, subduing dollarization under consistently appreciating dram, increasingly dynamic transfers from abroad have essentially affected the behavior of demand for money, making it more unstable and volatile. The growth of monetary aggregates has therefore had a changing impact on shaping both demand in the consumer market, and savings and investments. With these problems around, the CBA faces difficulty as it sees broad money often departing from the target indicator, jeopardizing implementation of monetary programs and making the CBA's reputation vulnerable.

The above-mentioned problems in Armenia in the past three years have been more obviously demonstrated in implementing the monetary policy. Considering the principal task of maintaining price stability, which the legislature has stipulated to be a certain level of inflation, the CBA has from time to time diverged from quantitative limitations of monetary aggregates. For this reason, the CBA has appeared with explanations before the public, the National Assembly, international financial institutions, commercial banks, press, and has released its statements.

So, where the strategy of monetary targeting suggested a possibility of achieving a target indicator of inflation through ensuring target levels of monetary aggregates, achieving the target indicator of inflation concomitant with the target indicator of monetary aggregates in Armenia has now become very difficult. This contradiction will be ongoing as both the level and structure of demand for money is awaiting material modification under a low level of dramization, large share of cash dram in circulation and high dollarization. As economy grows further, the dollarization will reduce, currency in circulation will shrink, while growing demand for money will notably outpace the GDP growth, having a low degree of predictability.

This is why the CBA finds it meaningful to change the monetary policy strategy, starting 2006, turning to a regime of inflation targeting from the prior strategy of monetary targeting. A target level of inflation will be the ultimate goal while a forecasted level of inflation will constitute the nominal anchor. Short-term interest rate will act as an operational target. In the meantime, for financial stabilization considerations, the CBA will also use monetary adjustment tools. As well as by using an inflation model, the CBA will forecast inflation of the future period, evaluate its deviation from the target indicator and direct the policy to eliminate the difference between target and forecast indicators. Pursuant to the principles of such a strategy, the CBA will no longer set a target indicator of broad money but will follow a target indicator of inflation instead. The main advantage of this strategy over the prior one lies in the availability of discretionary power. In other words, whereas the prior strategy considered broad money as the only factor determining inflation, the inflation targeting strategy considers a broad spectrum of factors with their likely impacts, including people’s expectations about the future. So, the CBA will take approaches based on judgments on the future.

An inflation targeting strategy requires existence of a handful of institutional, operational and macroeconomic conditions (price stability, operational independence of the CBA, clear understanding of a transmission mechanism, an inflation model, an unpretentious fiscal policy, developed financial market, stable equilibrium in domestic and external economy, etc.). Currently, the CBA generally meets the required conditions but a small financial market creates difficulties in identifying operation of channels of transmission of the monetary policy, thus in building an inflation model.

In view of implementing an inflation targeting strategy, accountability and transparency of the CBA becomes really very important, requiring from the CBA to frequently publish an inflation forecast, present the pace of implementation of the strategy in reports that will be released over 2006 as quarterly papers. Such openness and accountability will enhance the people's confidence in the CBA and raise effectiveness of the policy it carries out.

The year 2006 will be transitional for the inflation targeting strategy: above all, quantitative limitations of floor of NFA and ceiling of NDA from the prior strategy will be maintained until legislative changes covering these are effected, and secondly, the CBA will not be able to report on a 12-month inflation indicator by December 2007, because only in December would the 12-month inflation be shaped in conformity with the inflation targeting strategy. Despite this, quarterly inflation reports covering behavior of a one-year inflation prior to the end of each quarter and the forecast of the next quarter's inflation will be published.

The strategy of the CBA has the following profile:

1. The CBA will adopt a forecasted level of inflation as a nominal anchor because the monetary aggregates anchor does not work now and will not work in the future, too, while considering the exchange rate as a nominal anchor is not advisable.
2. Starting 2006, the CBA will commence a move to a fully-fledged inflation targeting strategy.
3. Total inflation will be taken as an inflation indicator. Inflation reports, which the CBA will release since 2006 in a quarterly periodicity, will give a detailed account of inflationary developments for the period in review and trends throughout a year. Exclusive events, which are recognized by the international practice to be non-monetary factors objectively affecting inflation, will be reviewed and commented in more detail, as follows:
   - Material divergence of forecasted and actual world prices;
   - Notable fluctuations of the dram exchange rate, determined by external shocks, which is not reflecting economic fundamentals of the economy and conducted monetary policy;
   - Notable changes in the agriculture that reflect prices of goods;
   - Natural disasters and other emergencies that may generate price shocks determined by supply or demand.
4. Conditional forecasted level of inflation will be published[1].
5. Short-term interest rate will be taken as an operational target, and meanwhile, for financial stabilization considerations, the CBA will also use tools for monetary adjustment. The latter elements are expedient also because the CBA will not yet quit all

[1] *Publication of the conventional forecasted level of inflation involves presentation of qualitative characteristics of the pace of the monetary policy. In publishing non-conventional forecasts, the quantitative characteristics will be presented along with the qualitative characteristics.*

the principles of the monetary targeting strategy – it will retain limitations of floor of NFA and ceiling of NDA. Activities derived from a discretionary power will be explained and published.

6. The CBA will develop current models of inflation forecasting into a single model of quarterly forecasts. The forecast level of inflation will become an intermediate target and be published in quarterly periodicity. The single model of inflation forecasting will be published after the adoption of a fully-fledged inflation targeting strategy.
7. Although the inflation targeting strategy is entirely within the framework of the Republic of Armenia Law on the Central Bank (provisions of Article 4), certain amendments in the law are, however, necessary to make sure relationship with the National Assembly and the general public is made clearer and the CBA's accountability by newest standards is strengthened. To this end, the CBA will be submitting a draft law to the Government in August 2006, according to the list in the 'Measures for Execution of the Government Programs'. In the event of transition to a fully-fledged inflation targeting regime legislative change would be required so that the law does not specify the ceilings for broad money and lending to the economy, which contradicts the logic of a fully-fledged inflation targeting strategy.
8. Concurrent with the adoption of a fully-fledged inflation targeting strategy:
   - target horizon will be enlarged, taking onto account impact lags of the policy conducted;
   - a forecasted level of non-conditional inflation will be published that will include not only qualitative but also quantitative characteristics of the pace of the monetary policy.

***The main directions of the monetary policy in 2006***

The main directions of the monetary policy in 2006 have been developed based on the forecasts of demand for money, by giving priority to achieving a target inflation indicator of up to 3%. As opposed to the prior strategy of monetary targeting that targeted monetary aggregates indicators and these indicators were to be achieved in order to meet the inflation objective, the new strategy counts such monetary aggregates indicators being just predictions which, along with developments in other sectors and impacts from the rest of the world, are viewed as factors that determine inflation. So, as short-term interest rate is going to act as an operational target of the monetary policy since 2006, aggregate demand will be adjusted through interest rates, in managing the inflation.

Under the new strategy of inflation targeting, the dram exchange rate will be formed in the market, and the CBA will not make exchange rate forecasts. Nor the CBA will forecast interest rates.

Demand for money in the economy has been estimated under the 10% real economic growth and up to 3% inflation. Expansionary budget that reflects large-scale spending from the TUA and the external sources of financing, and other sources (the Lincy Foundation) is among distinctive features of the year. Because of a budget performing in such a way the monetary policy of the CBA over 2006 will be directed to curtail liquidity.

Considering forecasts of demand for money in 2006 (Annex 8), growth of dram broad money at yearend will be 27%, with average annual growth of 31.6%. Fast growing average indicator is explained by currency substitution, attributable to sharp growth of dram aggregates in the second half of 2005.

In the structure of dram broad money, both currency in circulation and dram-denominated deposits are expected to grow, connected with medium-term and long-term factors determining dramization of the economy. These factors are high growth rates of the economy and lending to the economy, and increasingly firm confidence in the dram. The growth of dram deposits will be faster than the growth of cash, making up at the yearend 39.2% and 20.4%, respectively. Because of currency substitution, the growth rate of FX deposits will lag behind that of dram deposits, making up 14.7%. FX deposits however will grow over the year as a result of growth of external trade turnover and private transfers. Broad money is expected to increase at the end of 2006 by 21.9%, with average annual growth of 23.7%. When anticipated growth rates of broad money and dram broad money are compared with the 2006 GDP growth rate (14.4%), it becomes obvious that the monetization of the economy increases. Total monetization of the economy will rise by 8%, dramization by 15.1%. Velocities of broad money and dram broad money will decelerate, losing their pace faster than in previous years.

Net foreign assets of the banking sector will increase over the year by 13.2%, totally determined by the growth of net foreign assets of the CBA by 16.5%. Net foreign assets of commercial banks will decline in a slower pace (by 13.5%), determined by domestic FX lending of about AMD 3.5 billion, which is more in volume than the foreign currency resources attracted from residents.

Domestic assets of commercial banks will be allocated as follows: in 2006, assets of the banking sector will grow on account of a deposit base to AMD 51 billion. Further, assets will be added by another AMD 16.6 billion on account of growing profit and capital (that are reflected in other assets). Of these assets, about AMD 44 billion will be used in lending to the economy, more than AMD 20 billion will be invested in securities of the CBA and AMD 6 billion will be invested in government bonds.

The government liabilities to the banking sector will increase by AMD 18.4 billion (amounting to AMD 9.2 billion); such liabilities to the CBA will increase by AMD 12.4 billion.

Attributable to the above-said flows in lending to the economy, government liabilities and other assets, net domestic assets of the banking sector will increase by 47.9%.

As lending grows by 25.6% and the share of cash dram in broad money reduces, dram multiplier will rise over the year by 2.6% to 1.15. Money multiplier however will not grow as it will still feel the effect of the change introduced to the reserve requirement mechanism in 2005. Money multiplier will drop over the year by 3.6% to 2.0.

***Monetary base and interest rates***

In view of money demand forecasts, and to make sure supply of money in 2006 is in place, the CBA envisages 17.3% growth and an average 28.3% growth for broad money against the end of 2005. AMD 32.4 billion growth of monetary base will be generated as a result of NFA grown by AMD 39.8 billion and NDA reduced by AMD 7.4 billion. That said, a budget performing in an expansionary pattern would seem to materially affect the flows of monetary base. Particularly, monetary base will grow by more than AMD 40 billion due to conversions at the CBA and spending from the TUA.

In the meantime, the CBA's lending to commercial banks to the expense of resources under the KfW programs will draw an expansionary impact on monetary base, to the extent of about AMD 3 billion.

It seems apparent that excess liquidity would be persisting throughout the year, and that the CBA would offset excess liquidity's impact on inflation, using a complete toolkit. During the year, reverse repurchase agreements will be concluded; foreign currency will be sold, and the CBA will issue own bonds that will report a net growth of more than AMD 20 billion.

The volume of issuance of the CBA bonds may change depending on two important circumstances. First, where the fiscal policy fails to be implemented according to the proportions laid down in the Republic of Armenia Law on State Budget – particularly, if the expenditure cut-downs of prior years are repeated in 2006 – the issuance of the CBA bonds will be smaller. Second, where external capital inflow in the private sector exceeds the CBA projections, the monetary policy will move on through FX purchase operations, while larger than projected issuance of the CBA bonds will offset the liquidity in order to achieve a target inflation indicator.

Considering these scenarios and analyzing the yield curve, and given the supply of medium-term and long-term bonds, and trends of falling interest rates in the T-bills market in recent years, there arises an assumption that the yield of bonds would remain at almost the same level that was recorded at the end of 2005. As regards the short-term segment of the yield curve, the first scenario suggests that interest rates would retain the same level, and the second scenario contemplates that, attributable to an increase in supply, certain rise in interest rates in a short-run is likely.

# BANKING SECTOR DEVELOPMENTS[1]

## Bank and credit institution developments in 2005

Previous development trends in the Armenian banking sector persisted during 2005. Total assets, liabilities and capital in the sector have grown over the first nine months.

Overall, the structure of assets and liabilities of the banking sector has not seen any specific developments versus previous year, except for material changes in the currency structure of assets and liabilities. In 2005 too, the pace of growth of loans to individuals and legal entities was almost equal. In the structure of deposits, the growth of term deposits again outpaced demand deposits. The growth of both term and demand deposits (including bank accounts) was determined mainly by an increase of deposits of legal entities. The distinction of the year 2005, however, was that increased dram-denominated assets and liabilities have been the principal contribution to the growth of assets and liabilities. Foreign currency funds attracted and allocated have augmented, even though slowly. Dram-denominated assets and liabilities have grown by 33% and 27%, and foreign currency assets and liabilities by 3% and 5%, respectively. In 2005 the banking sector paid extensively in the statutory fund.

A banking license has been issued to ArmSwissBank CJSC. As of the end of Q3 2005, there were 21 commercial banks with 252 branch offices in the Armenian banking sector. All banks were operating under general supervisory framework.

A license has been issued to Washington Capital CJSC, a universal credit institution. As of the end of September 2005, there were 10 credit organizations with 2 branch offices. Credit organizations have demonstrated development trends consistent with the banking system. Though being still a small part of the financial sector (total assets of credit institutions are not going beyond 1.8% of the assets in the banking sector), credit institutions have a potential for rapid growth, as assets, liabilities and capital in 2005 grew faster in relation to those of the banking system.

***Liabilities***

Total liabilities[2] of the banking sector over the three quarters of 2005 have grown by 10.6% or AMD 31.7 billion. Gross growth of deposits, almost entirely on account of domestic sources, has been the main contribution to the growth of liabilities.

The growth of term deposits vis-á-vis demand deposits was faster, by 16.8% (AMD 15.4 billion) and 6% (AMD 8.1 billion), respectively.

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[1] *The indicators on deposits and loans may not coincide with the indicators in other sections of the Program as this section includes funds of both residents and non-residents, whereas the others include funds of residents only.*

[2] *The analysis of the banking sector was made by comparing general indicators of 20 banks operating under general supervisory framework as of 31/12/2004 with general indicators of 21 banks operating under general supervisory framework as of 30/09/2005.*

The growth of both demand and term deposits over the nine months of 2005 was bolstered up by deposits of legal entities. This performance has been typical to the previous year, too. Buoyant economic activity has contributed to the growth of deposits of legal entities. Demand and term deposits of legal entities altogether have grown by 20% (AMD 23.9 billion) but total deposits of physical entities have fallen by 0.3% (AMD 0.4 billion).

The growth of deposits and total liabilities in the banking sector in Q4 2005 is expected to be about AMD 3 billion and AMD 7 billion, respectively.

Liabilities[3] of credit organizations grew in 2005 by 33.6% to AMD 3.2 billion or 1.0% of liabilities of the banking sector. As of September 30 2005, funds borrowed from legal and individuals made up 45% of total liabilities, with legal entities representing 67% and individuals representing 33% of the total borrowing of AMD 1.4 billion.

***Capital***

The banking sector over the nine months of 2005 has seen a record growth of capital, with the net book value having risen by 33% or AMD 21.3 billion.

Statutory fund of the system increased by AMD 16.0 billion, mostly from external sources that pushed non-resident equity participation from 52.6% up to 54.2% of the statutory fund. Given the minimum total capital requirement, introduced since July 1 2005 to be AMD 2.4 billion, 13 banks have paid up the statutory fund.

Over the three quarters of the year, the banking sector has generated profit of AMD 9.3 billion, which grew by 26.2% versus the pervious year's 9-month profit. Such profits were attributable to added interest income on lending to the economy (owing to more loans other than risen interest rates), reduced net provisioning against assets (owing to enhanced quality of loans in 2005), and the growth of non-interest income.

The banking sector has paid dividends of AMD 2.2 billion from the profit of the preceding period.

The total capital in Q4 2005 is expected to grow by AMD 5.6 billion, in which statutory fund would rise by about AMD 2.1 billion and profit by AMD 3.5 billion.

The total capital of credit organizations over the nine months of 2005 have grown by 27.8%, amounting to AMD 4.2 billion or 5% of the banking sector capital. Three credit organizations' contribution to the statutory fund by AMD 962 million has boosted the growth. Undistributed profit of credit institutions was AMD 6 million.

***Assets***

Over the three quarters of 2005, total assets of the banking sector have grown by 14.6% or AMD 53.1 billion, 58.5% of which invested in

[3] *The analysis of credit organizations was made by comparing general indicators of 9 credit institutions operating as of 31/12/2004 with general indicators of 10 credit institutions operating as of 30/09/2005.*

lending to the economy. The growth of lending to the economy has been notably quicker in relation to the growth of total assets, making up 23.5%. The volume of lending to individuals has increased by 33.3% (AMD 16.5 billion), to legal entities, by 16.6% (AMD 13.2 billion).

Growth trends of consumer loans in 2005 persisted. Consumer loans over the nine months have risen by 38% (AMD 15.1 billion). Almost all sectors of the economy have reported growth in loan investment. Lending has declined only in the mining industry. The seasonality of loan investment by branches remained almost the same compared with the previous year.

Extensive growth of loan investment has been concomitant with subduing share of poor-quality loans. Loans classified earlier the year constituted 3% of total loans; loans classified at the end of September – 2%. The growth of loan investment in the last two years has been outpacing the growth of total loans while the quality of loans is rising.

Total assets in Q4 are anticipated to grow by AMD 12.6 billion and loans to the economy to augment by about AMD 20 billion. The growth of loans will be partly determined by declining high liquid assets.

During the first nine months of 2005, total assets of credit institutions have grown by 30.2% and amounted to AMD 7.4 billion or 1.8% of the assets of the banking sector. Loan investment, leasing and factoring operations included, has contributed to the growth. The growth of lending to the industry by 70% or AMD 716 million and consumer loans by 49% or AMD 571 million was essential in the loan investment.

Steady growth of generalized indicators of the activity of the banking sector in 2005 are profiled as follows: at the end of September 2005, total assets amounted to AMD 416.6 billion, total liabilities AMD 330.6 billion, and total capital AMD 86.0 billion. At the yearend 2005, total assets of the system are expected to be AMD 429.2 billion, total liabilities AMD 337.6 billion, and total capital AMD 91.6 billion. At the end of the year, nominal GDP will total AMD 2.2 trillion, pushing the degree of financial intermediation of the banking sector slightly up. So, the total assets/GDP ratio at the yearend will be 19.5%, whereas lending to the economy by the banking sector will be 8.1% of GDP compared with the previous year's indicators of 19.2% and 7.0%, respectively.

## Forecasting banking sector developments in 2006

Estimations show that developments in the banking sector recorded in recent years will carry on in 2006. The system will see the capital, liabilities and assets growing. Loan investment in 2006 is expected to again outstrip the growth of total assets. The market of mortgage loans is anticipated to be quite dynamic.

### *Capital*

The growth of total capital of the banking sector over 2006 is forecasted[4] to be around AMD 16 billion, making total capital to reach close to AMD 108 billion at the yearend.

[4] *The forecast made for this section was based on:*

Based on a review of the main sources of income, customer base, previous trends of growth of income of banks, and considering the demand in the loan market and how the loan interest rates trend, undistributed profit for 2006 is estimated to be AMD 18.0 billion which is about AMD 5.2 billion more than the indicator in 2005.

It is also estimated that the statutory fund of the banking sector would be added by AMD 0.6 billion, and certain banks will use undistributed profit of the past years to pay dividends in 2006 at the amount of around AMD 2.6 billion.

***Liabilities***

The growth of total liabilities over 2006 is expected to be about AMD 65 billion, causing total liabilities of the system to reach close to AMD 402 billion at the yearend.

An increase of deposits by about AMD 55 billion, in which about AMD 51 billion is the share of residents and AMD 4 billion is the share of non-residents, will be the main contribution to the growth of total liabilities. The main factors for estimation of such a growth included trends of growth of deposits at banks, household deposits, growing number of plastic cards in circulation, banks' demand for deposits, trends of interest rates of term deposits, and the public sentiment for a deposit guarantee scheme, and etc. In addition to deposits in estimating the growth of total liabilities, the amounts to be disbursed to banks under various international projects over 2006 and other non-deposit resources were considered.

***Assets***

Total assets of the banking sector are expected to grow over 2006 by about AMD 81 billion, making the yearend indicator to reach AMD 510 billion.

The growth of total assets will be determined by an expected growth of liabilities and capital. It is further anticipated that nearly 55% of excess resources (AMD 45 billion) would be allocated as loan investment and 32% (AMD 26 billion) would be invested in government securities[5].

**Measures to be taken by the CBA in 2006**

Despite still being weak, financial intermediation of the Armenian banking sector is slowly but steadfastly getting impetus. The CBA is planning a handful of measures over 2006 to foster a healthy competition environment in the banking sector, make sure the system is liquid and stable, and to enhance the role of financial intermediation.

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- *Strategic programs submitted by commercial banks, and expert assessment made by summarizing and analyzing these programs;*
- *Recent trends in the banking sector;*
- *Typical features of the banking sector in 2005, and the likelihood that such features would persist and the new ones would emerge over 2006; and*
- *The impact of anticipated developments in the real sector on generalized system indicators in 2006.*

[5] *The risks of deviations from such forecasts in the banking sector are also estimated. Particularly, the growth of resident deposits may be smaller than the forecast by approximately AMD 10 billion, so this much would do total liabilities and assets of the banking sector, accordingly. On the assets side, this would create an AMD 10 billion negative deviation from the forecast for investment in government securities by the banking sector.*

In 2005 a concept for unified financial system regulation and supervision was developed. The concept envisages centralizing the functions of financial system regulation and supervision under the CBA, starting January 1 2006, which pursues a key objective of oversight of common risks in the financial market by a single entity. Banking, insurance and securities operations, increasingly tended to combine, is typical to developing financial systems. This requires a supervision to review thoroughly how a financial market develops, and to evaluate risks inherent in different sectors of the market. Based on the concept, certain changes have been introduced to respective laws.

Performance of functions of regulation and supervision of the financial system by a single entity starting January 1 2006 underscores the importance of ensuring an integrated framework for regulation of activity of all the entities subject to supervision. Institutionalization of the Armenian financial sector is of paramount importance in strengthening and developing a liquid and stable financial system in the country. To this end, work is planned in 2006 to prepare a concept for Armenia's financial system development.

Sustainable functioning of the financial system is determined by developments in the economy. To evaluate the financial soundness, financial risks and risks that pose threat to financial stability from inward and outward economies need to be thoroughly reviewed.

A concept of framework for ensuring financial stability at the CBA was developed. It mainly pursues a goal of overall description of financial stability, disclosure and evaluation of risks that pose threat to the system, as well as providing for measures to minimize such risks. The CBA will carry on its work over 2006 to enforce the provisions contained in the concept. Particularly, the methodologies developed in 2005 to forecast bank indicators, earnings and liquidity and credit risk will reach finalization and be presented in 2006. Work will start in 2006 on identifying and reviewing the risks existing in insurance and securities markets, and estimating their impact in terms of financial soundness. Forecasts, assessment of risk levels will be important in foreseeing, and making an appropriate response to, the developments in the financial sector, and in monetary policy programming.

The CBA positively responded to the Basle II Accord and is working on introducing the provisions of the Accord. The adoption of the principles of corporate governance was seen as a transitional precondition. In consultation with the Union of Armenian Banks, the CBA prepared in 2005 a finalized version of the Concept of Corporate Governance at Banks and submitted the same as changes and supplements to the Republic of Armenia Law on Banks and Banking to the Government of Armenia for consideration. These amendments have been presented to the National Assembly and approved by it at the second hearing. Once the corporate governance principles are adopted, the CBA will begin moving to Basle II Accord implementation.

In 2005 the Financial Sector Assessment Program[6] mission visited Armenia. The mission carried out assessment of compliance of the Armenian supervisory framework with the Basle Core Principles of Effective Supervision. In 2006 the CBA will further make sure that the domestic banking supervision complies with the Basle requirements, particularly:

- respective changes will be introduced to the Regulation 2 *Regulation of Banking; Prudential Standards for Banking* in order to include market risk in the calculation of capital adequacy;
- to raise effectiveness of supervision, parties concerned will team-work with supervisory bodies of those countries who have bank subsidiaries incorporated and functioning in Armenia. Memoranda of understanding are planned to be concluded with supervisory authorities of United Kingdom, Iran and Kazakhstan;
- cooperation between the CBA and independent audit firms involving discussion of scope of the audit with the auditors, trilateral meetings between the CBA supervisors, a bank and the external auditor to review results of the audit and launch follow-up measures is planned.

The CBA will carry on examining activity of foreign currency exchange units in 2006, further making sure that their business is transparent as well as raising the quality of service rendered to households.

The CBA will go on with the measures designed to combat 'money laundering' to provide for legal mechanisms for stability of the economy and defend the public and state interest.

There is quite a large demand in the economy for mortgage loans. Scarcity of long-term funds in the banking sector is a serious impediment to the growth of mortgage loans. The CBA will take certain actions over 2006 for the development of the mortgage market. Particularly, the KfW and the CBA will continue to cooperate as the German Development Bank will be providing banks and credit organizations in the period 2006-2007 with credit to the tune of EUR 12 million under the mortgage market development project. These funds are intended to be disbursed to those banks and credit institutions who will introduce 'minimum quality standards' of mortgage lending. The disbursement of loan funds under this project is planned starting the second quarter 2006.

The CBA participates in developing and introducing legislative and sub-legislative changes and supplements designed to develop the mortgage loans market in Armenia. The package of changes to a number of laws has been presented to the National Assembly and is awaiting endorsement by yearend.

In 2006 the CBA plans to carry out work for the secondary mortgage market development. The secondary mortgage loan operator that will pursue refinancing of mortgage lender banks by means of mortgage-backed securities will be established at some later time.

Reforms in the pension system may essentially contribute to the creation of long-term resources in the economy. In 2005 the CBA kept on participating in measures designed to improve the Armenian pension

[6] *The World Bank and International Monetary Fund regularly carry out studies in different countries under the Financial Sector Assessment Project framework.*

system. Particularly, a model for implementation of reforms is being sought in connection with the introduction of the cumulative pension system in Armenia that is supposed to create warranty for further enlargement and development of the financial sector. Efforts will further be spent over 2006 too, in reforming the pension system.

# DEVELOPMENT OF PAYMENTS AND SETTLEMENTS RELATIONS

The CBA will carry out work over 2006 to develop the Armenian payments and settlements system in the following directions:

1. Development of non-cash payments;
2. Regulation and oversight of payment systems; and
3. Design of new technologies.

In 2006 the CBA is planning to launch an extensive activity of taking the household to the culture of non-cash payments. Possibilities of developing non-cash circulation of small-value payments will be explored and reviewed. Particularly, the CBA will support the Government in paying subsidies, pensions and other social disbursements through the banking sector, including by payment cards.

The CBA will go on with regulating the payments and settlements system of Armenia. Particularly, a handful of regulatory documents were endorsed in 2005 based on the Republic of Armenia Law on Payment System and Payments and Settlements Organizations. The legal framework will further be improved over 2006 to meet the principles of financial stability and consolidated supervision adopted by the CBA.

The CBA also envisages creating legal, methodological and technological preconditions for issuance and circulation of corporate securities and providing for operations in the secondary market. Work will be carried out over the year to develop a system that would allow to perform foreign exchange operations at the Armenian stock exchange.

Given the policy of identifying and managing risks in financial systems and considering the trends of development of the payments and settlements system, the CBA will continue introducing the principles of the payments and settlements system oversight in Armenia and regulating related processes.

Prevention of, and minimization of risks in, fraud and forgery in connection with plastic cards, checks and other payment instruments, as well as a study of international experience in this area for an effective and streamlined implementation will remain under the CBA's focus.

In the period 2006-2007, the development of terms and conditions for issuance of 'smart' cards are planned under the 'ArCa' payment system. Plans also include a complete servicing of cards ('smart', chip) issued by Visa, MasterCard and other international card systems.

# Commentary for the Main Indicators

1. There are data discrepancies in the actual nominal GDP and its expenditure components, real growth rates and deflators provided in the monetary policy programs for 2006 and 2005, and other publications of the CBA. During 2005 the National Statistics Service of Armenia (NSSA) revised these indicators and published them in "Socio-economic situation in Armenia", in the January-March and January-April, 2005 issues. The CBA used the revised data in preparing the program for 2006.
2. The above-mentioned indicators for 2004 are still subject to revision and the 2005 indicators are the CBA estimations based on the official data as reported between January September, and between January–December, 2005.
3. The 2005 external and fiscal sectors indicators used in the monetary policy program for 2006 and the 2004 external and fiscal sectors indicators used in the monetary policy program for 2005 are the preliminary data of the NSSA and MoFE, and the CBA estimations.
4. The aggregate and private sector disposable income indicators are calculated by the CBA.
5. The figures used in the section Development of the Banking System are not compatible with those provided in other sections and annexes of the Program due to different classifications and groupings.

*Annex 2.1*

# Macroeconomic Indicator Survey

| | 2003 (actual) | 2004 (actual) | 2005 (estimation) | 2006 (program) |
|---|---|---|---|---|
| **National income and prices (interest change)** | | | | |
| Real GDP index | 113.9 | 110.1 | 111.3 | 110.0 |
| GDP deflator | 104.6 | 106.0 | 104.2 | 104.0 |
| Consumer price index (to December of previous year) | 108.6 | 102.0 | 100.5 | 103.0 |
| Inflation (12-month) % | 8.6 | 2.0 | 0.5 | 3.0 |
| Inflation (period average, to the same period of previous year), % | 4.7 | 7.0 | 0.7 | 2.1 |
| **External sector** | | | | |
| Export of goods and services (share of GDP) | 32.2 | 27.7 | 26.9 | 24.3 |
| Import of goods and services (share of GDP) | 50.1 | 42.8 | 39.7 | 36.9 |
| Current account (excluding official transfers, share of GDP) | -8.9 | -6.3 | -4.4 | -4.7 |
| Current account (including official transfers, share of GDP) | -6.8 | -4.5 | -3.2 | -3.8 |
| Import coverage (by months) | 4.3 | 4.3 | 4.5 | 4.2 |
| Exchange rate percentage change | 0.9 | -7.8 | -14.0 | -8.5 |
| **Central government** | | | | |
| Consolidated budget revenue (share of GDP) | 18.5 | 19.1 | 19.5 | 19.0 |
| Consolidated budget tax revenue (share of GDP) | 17.0 | 17.2 | 17.6 | 17.8 |
| Consolidated budget expenditure (share of GDP)* | 20.2 | 20.8 | 20.8 | 21.8 |
| Consolidated budget deficit (share of GDP) | -1.4 | -1.7 | -1.3 | -2.8 |
| **Monetary sector** | | | | |
| Broad money growth (%) (M2X average) | 22.9 | 18.7 | 28.7 | 23.7 |
| Broad money velocity (GDP/M2X average) | 8.1 | 7.9 | 7.2 | 6.6 |
| Money multiplier (M2X) | 2.0 | 2.2 | 2.1 | 2.0 |
| Dram broad money growth (%) (M2 average) | 33.3 | 6.1 | 34.2 | 31.6 |
| Dram broad money velocity (GDP/M2 average) | 13.8 | 15.2 | 13.2 | 11.4 |
| Dram broad money multiplier (M2) | 1.15 | 1.14 | 1.12 | 1.15 |
| Monetary base, % (average) | 25.1 | 7.0 | 36.1 | 28.3 |

* *Excluding resources of the Lincy Fund.*

# GDP Expenditure Component Deflators and Real Growth

| | 2003 (actual) | 2004 (actual) | 2005 (estimation) | 2006 (program) |
|---|---|---|---|---|
| Inflation (to December of previous year) | 8.6 | 2.0 | 0.5 | 3.0 |
| Inflation (12-month) | 8.6 | 2.0 | 0.5 | 3.0 |
| Inflation (average, to the same period of previous year), % | 4.7 | 7.0 | 0.7 | 2.1 |
| **Deflators** | | | | |
| GDP deflator | 104.6 | 106.0 | 104.2 | 104.0 |
| Consumption deflator | 104.5 | 106.7 | 99.2 | 103.0 |
| Public | 106.8 | 105.5 | 99.2 | 103.0 |
| Private | 104.3 | 106.8 | 99.2 | 103.0 |
| Capital investments deflator | 102.1 | 102.6 | 115.0 | 103.5 |
| Public | 102.1 | 102.6 | 115.0 | 103.5 |
| Private | 102.1 | 102.6 | 115.0 | 103.5 |
| Export deflator | 99.8 | 99.3 | 105.0 | 93.4 |
| Import deflator | 104.1 | 101.4 | 91.4 | 95.9 |
| **Exchange rate (AMD/USD)** | | | | |
| Period average | 578.77 | 533.4 | 458.9 | 420.0 |
| Interest change (cumulative) | 0.9 | -7.8 | -14.0 | -8.5 |
| **Percentage change index (real)** | | | | |
| Real GDP | 113.91 | 110.1 | 111.3 | 110.0 |
| Consumption | 107.6 | 110.9 | 108.0 | 107.1 |
| Public | 114.1 | 116.2 | 110.9 | 105.1 |
| Private | 106.9 | 110.2 | 107.7 | 107.4 |
| Capital investments | 132.9 | 112.3 | 118.7 | 118.6 |
| Public | 117.4 | 73.2 | 96.5 | 158.4 |
| Private | 135.4 | 124.1 | 122.8 | 112.9 |
| Export of goods and services | 131.0 | 101.1 | 107.2 | 110.6 |
| Import of goods and services | 123.1 | 98.4 | 117.7 | 110.7 |

# GDP by Expenditure Components

| | 2003 (actual) | 2004 (actual) | 2005 (estimation) | 2006 (program) |
|---|---|---|---|---|
| ***Current market prices (mln drams)*** | | | | |
| Nominal GDP | 1624643 | 1896442 | 2199533 | 2516373 |
| Consumption | 1518890 | 1796528 | 1925130 | 2124100 |
| Public | 165831 | 203443 | 223801 | 242255 |
| Private | 1353059 | 1593085 | 1701329 | 1881845 |
| Capital investments | 394104.7 | 453853 | 619723 | 760927 |
| Public | 93195 | 69974 | 77660 | 127384 |
| Private | 300910 | 383879 | 542063 | 633543 |
| Export of goods and services | 522909 | 525344 | 591632 | 611255 |
| Import of goods and services | 813433 | 811761 | 873361 | 927461 |
| Statistical discrepancy | 2172 | -67523 | -63590 | -52448 |
| Net factor income | 54493 | 18663 | 37728 | 46137 |
| Net transfers | 126035 | 173962 | 174547 | 174092 |
| Private | 91201 | 141448 | 148510 | 152966 |
| Official | 34834 | 32514 | 26037 | 21126 |
| Gross national disposable income* | 1805170 | 2089067 | 2411808 | 2736602 |
| Private sector disposable income | 1610629 | 1860370 | 2128247 | 2432595 |
| ***Percentage change index (nominal)*** | | | | |
| Nominal GDP | 119.2 | 116.7 | 116.0 | 114.4 |
| Consumption | 112.5 | 118.3 | 107.2 | 110.3 |
| Public | 121.9 | 122.7 | 110.0 | 108.2 |
| Private | 111.5 | 117.7 | 106.9 | 110.6 |
| Capital investments | 133.5 | 115.2 | 136.5 | 122.8 |
| Public | 119.9 | 75.1 | 111.0 | 164.0 |
| Private | 138.3 | 127.6 | 141.2 | 116.9 |
| Export of goods and services | 130.7 | 100.5 | 112.6 | 103.3 |
| Import of goods and services | 128.2 | 99.8 | 107.6 | 106.2 |

* *According to the CBA estimations.*

# Balance of Payments

*(mln US dollars)*

| | 2003 *(actual)* | 2004 *(actual)* | 2005 *(estimation)* | 2006 *(program)* |
|---|---|---|---|---|
| Current account (including official transfers) | -190.6 | -161.6 | -153.2 | -230.5 |
| Current account (excluding official transfers) | -250.8 | -222.6 | -209.9 | -280.8 |
| Trade balance | -434.1 | -458.0 | -563.1 | -696.8 |
| Export | 696.1 | 738.3 | 985.1 | 1105.6 |
| Export (excluding precious stones and metals) | 346.7 | 423.7 | 627.6 | 716.6 |
| Import | -1130.2 | -1196.3 | -1548.2 | -1802.4 |
| Import (excluding precious stones and metals) | -800.6 | -900.8 | -1175.2 | -1398.6 |
| Services (net) | -68.3 | -70.7 | -52.7 | -58.1 |
| Credit | 207.4 | 246.6 | 304.2 | 349.8 |
| Debit | -275.7 | -317.4 | -356.9 | -407.9 |
| Income (net) | 93.4 | 36.7 | 82.2 | 109.8 |
| Private transfers (net) | 158.3 | 269.4 | 323.6 | 364.2 |
| Official transfers (net) | 60.2 | 61.0 | 56.7 | 50.3 |
| Capital and financial account | 236.3 | 189.8 | 346.2 | 315.3 |
| Capital transfers | 89.9 | 34.3 | 31.0 | 50.0 |
| Foreign direct investments | 120.5 | 216.5 | 219.7 | 230.0 |
| Portfolio investments | 0.3 | -2.9 | -1.3 | 0.0 |
| Public sector (net) | -3.1 | 38.5 | 82.2 | 72.8 |
| Disbursements | 92.3 | 87.7 | 97.0 | 90.1 |
| Amortization | -95.5 | -49.3 | -14.8 | -17.3 |
| Other capital | 28.7 | -96.7 | 14.6 | -37.5 |
| Privatization account | 2.2 | -19.9 | -56.9 | 45.2 |
| Net foreign assets of banks | -42.4 | -30.5 | 39.1 | 8.5 |
| Other private sector | 69.0 | -46.3 | 32.4 | -91.2 |
| Overall balance | 45.7 | 28.1 | 193.0 | 84.8 |
| Change in gross international reserves (-growth) | -46.3 | -25.5 | -163.5 | -69.3 |
| Change in gross international liabilities (+growth) | 2.1 | -1.1 | -26.45 | -15.45 |
| International Monetary Fund (net) | 1.6 | -6.4 | -26.0 | -22.6 |
| Purchase/Disbursement | 27.1 | 28.2 | 10.2 | 10.2 |
| Repurchase/repayment | -25.5 | -34.6 | -36.1 | -32.8 |
| Other (net) | 0.6 | 5.3 | -0.5 | 7.2 |
| Financial gap | 1.6 | 1.5 | 3.1 | 0.0 |
| Errors and omissions | -1.6 | -1.5 | -3.1 | 0.0 |
| Vertical check | 0.0 | 0.0 | 0.0 | 0.0 |
| Trade balance/GDP | -15.5 | -12.9 | -11.7 | -11.6 |
| Current account (including official | -6.8 | -4.5 | -3.2 | -3.8 |

| | | | | |
|---|---|---|---|---|
| transfers)/GDP | | | | |
| Exchange rate (AMD/USD) Period average | 578.8 | 533.4 | 458.9 | 420.0 |

# Export and Import Prices

| | 2003 (actual) | 2004 (actual) | 2005 (estimation) | 2006 (program) |
|---|---|---|---|---|
| **Export** | | | | |
| Total | 98.9 | 107.8 | 122.1 | 102.0 |
| Investment goods | 102.3 | 99.9 | 97.8 | 100.0 |
| Consumer goods | 108.9 | 112.6 | 109.2 | 104.9 |
| Diamond | 90.1 | 98.9 | 100.0 | 100.0 |
| Intermediate goods | 103.7 | 113.7 | 145.0 | 99.0 |
| **Exports, total (in drams)** | 99.8 | 99.3 | 105.0 | 93.4 |
| **Import** | | | | |
| Total | 103.1 | 110.1 | 106.2 | 104.8 |
| Investment goods | 93.8 | 100.6 | 99.5 | 100.0 |
| Consumer goods | 112.4 | 111.0 | 107.8 | 103.2 |
| Intermediate goods | 98.7 | 105.8 | 97.4 | 106.0 |
| Oil products | 99.5 | 125.8 | 144.4 | 113.9 |
| Diamonds | 101.9 | 119.5 | 100.0 | 100.0 |
| Natural gas | 99.5 | 99.6 | 100.0 | 100.0 |
| **Imports, total (in dram)** | 104.1 | 101.4 | 91.4 | 95.9 |
| **Exchange rate (period average)** | 578.8 | 533.4 | 458.9 | 420.0 |

*Annex 2.6*

# Cash Flows of CBA Foreign Assets and Liabilities

*(mln US dollars)*

| | 2003 (actual) | 2004 (actual) | 2005 (estimation) | 2006 (program) |
|---|---|---|---|---|
| Interest on Government loans | -7.0 | -8.1 | -9.1 | -9.5 |
| Interest on Russian loans | -2.6 | 0.0 | -1.9 | 0.0 |
| Interest on CBA loans | -0.9 | -1.4 | -1.1 | -0.8 |
| IMF | -0.8 | -1.3 | -1.0 | -0.8 |
| KfW loans | -0.1 | -0.1 | -0.1 | 0.0 |
| Income on international reserves management | 8.4 | 10.3 | 19.7 | 20.0 |
| Interest on Georgian loan | 0.7 | 0.5 | 0.3 | 0.3 |
| Repayment of Georgian loan | 0.0 | 0.0 | 2.0 | 0.0 |
| Loans to Government | 34.8 | 3.9 | 6.3 | 4.8 |
| Multilateral (excluding IMF loan, net) | 36.5 | 5.6 | 8.0 | 6.5 |
| Disbursement | 42.8 | 21.2 | 20.0 | 20.0 |
| PRSC | 42.8 | 21.2 | 20.0 | 20.0 |
| Amortization | -6.3 | -15.6 | -12.0 | -13.5 |
| Bilateral | -1.7 | -1.7 | -1.7 | -1.7 |
| Disbursement | 0.0 | 0.0 | 0.0 | 0.0 |
| KfW | 0.0 | 0.0 | 0.0 | 0.0 |
| Amortization | -1.7 | -1.7 | -1.7 | -1.7 |
| Loans to CBA | 1.1 | -1.2 | -25.5 | -15.4 |
| IMF loans | 1.6 | -6.4 | -26.0 | -22.6 |
| Disbursement | 27.1 | 28.2 | 10.2 | 10.2 |
| Amortization | -25.5 | -34.6 | -36.1 | -32.8 |
| KfW | 0.0 | 5.6 | 0.0 | 7.2 |
| Disbursement | 0.0 | 5.6 | 0.0 | 7.2 |
| Amortization | 0.0 | 0.0 | 0.0 | 0.0 |
| Other | -0.5 | -0.3 | 0.5 | 0.0 |
| Lincy grants | 45.6 | 2.8 | 0.0 | 30.0 |
| Other grants | 17.1 | 18.6 | 21.4 | 19.8 |
| Conversion from privatization funds | 3.7 | 0.2 | 25.0 | 45.2 |
| Other conversions* | -54.5 | 0.0 | 126.3 | -25.0 |
| Change in gross international reserves | 46.3 | 25.5 | 163.5 | 69.3 |
| Change in gross foreign liabilities | 1.1 | -1.2 | -25.5 | -15.4 |
| Change in net foreign assets | 45.1 | 26.7 | 189.0 | 84.8 |
| ***Memorandum items (as of yearend)*** | | | | |
| Privatization fund | 8.2 | 28.1 | 84.9 | 39.7 |
| Credit | 1.5 | 20.0 | 86.9 | 0.0 |
| Debit | -3.7 | -0.2 | -25.0 | -45.2 |
| Gross international reserves (by program exchange rate) | 502.0 | 547.8 | 711.3 | 780.6 |
| Gross international liabilities | 230.2 | 240.5 | 215.0 | 199.6 |
| Net international assets (including KfW, as liability) | 271.7 | 307.3 | 496.3 | 581.0 |
| KfW | 15.2 | 22.8 | 22.8 | 30.0 |

** Includes CBA interventions in the interbank market, swap operations, and conversions for Government and other customers (membership fees, etc).*

*Annex 2.7*

# Broad Money

*(mln drams)*

| | 2003 *(actual)* | 2004 *(actual)* | 2005 *(estimation)* | 2006 *(program)* Q I | Q II | Q III | Q IV | 2006 |
|---|---|---|---|---|---|---|---|---|
| **Net foreign assets (NFA)*** ** | 194389 | 205095 | 270667 | 267447 | 270740 | 284519 | 306505 | 306505 |
| Central Bank *** | 153802 | 149266 | 241102 | 238870 | 243162 | 257939 | 280945 | 280945 |
| Commercial banks | 40587 | 55829 | 29566 | 28577 | 27579 | 26580 | 25560 | 25560 |
| **Net domestic assets (NDA)*** ** | 38809 | 80077 | 90419 | 91133 | 107369 | 126663 | 133699 | 133699 |
| Domestic credit | 87651 | 123730 | 163141 | 168830 | 187347 | 211497 | 225661 | 225661 |
| Public sector | -7417 | -10444 | -4038 | -9075 | -1497 | 13392 | 14364 | 14364 |
| Government | -14606 | -17249 | -9205 | -14242 | -6664 | 8225 | 9197 | 9197 |
| Public organizations | 7188 | 6805 | 5167 | 5167 | 5167 | 5167 | 5167 | 5167 |
| Private sector | 95069 | 134174 | 167178 | 177904 | 188843 | 198105 | 211297 | 211297 |
| Other items net *** | -48842 | -43653 | -72722 | -77696 | -79978 | -84834 | -91962 | -91962 |
| **Broad money (M2X, end of period)** | 233198 | 285172 | 361086 | 358580 | 378109 | 411181 | 440204 | 440204 |
| Currency in circulation | 91997 | 98569 | 137187 | 128667 | 137173 | 150703 | 165208 | 165208 |
| Dram deposits | 41233 | 46969 | 74158 | 75666 | 82676 | 94698 | 103204 | 103204 |
| FX deposits | 99968 | 139634 | 149741 | 154247 | 158260 | 165780 | 171792 | 171792 |
| **Dram broad money (M2, end of period)** | 133230 | 145538 | 211345 | 204333 | 219849 | 245401 | 268412 | 268412 |
| **Note:** | | | | | | | | |
| Broad money (M2X average) | 201005 | 238652 | 307064 | 350178 | 364818 | 388329 | 416158 | 379871 |
| Dram broad money (M2 average) | 117458 | 124622 | 167201 | 198184 | 208565 | 226309 | 247372 | 220108 |
| Broad money velocity (GDP/M2X, average)* | 8.08 | 7.95 | 7.16 | 0.79 | 1.42 | 2.21 | 2.08 | 6.62 |
| Dram broad money velocity (GDP/M2, average)* | 13.83 | 15.22 | 13.16 | 1.40 | 2.48 | 3.79 | 3.49 | 11.43 |
| Money multiplier (M2X)** | 1.96 | 2.18 | 2.06 | 1.98 | 2.00 | 1.98 | 1.99 | 1.99 |
| Dram multiplier (M2)** | 1.15 | 1.14 | 1.12 | 1.12 | 1.14 | 1.16 | 1.18 | 1.15 |

# Broad Money

*(percentage change)*

| | 2003 (actual) | 2004 (actual) | 2005 (estimation) | 2006 (program) Q I | Q II | Q III | Q IV | 2006 |
|---|---|---|---|---|---|---|---|---|
| **Net foreign assets (NFA)** | 30.5 | 5.5 | 32.0 | -1.2 | 1.2 | 5.1 | 7.7 | 13.2 |
| Central Bank | 17.8 | -2.9 | 61.5 | -0.9 | 1.8 | 6.1 | 8.9 | 16.5 |
| Commercial banks | 122.0 | 37.6 | -47.0 | -3.3 | -3.5 | -3.6 | -3.8 | -13.5 |
| **Net domestic assets (NDA)** | -27.7 | 106.3 | 12.9 | 0.8 | 17.8 | 18.0 | 5.6 | 47.9 |
| Domestic credit | -6.2 | 41.2 | 31.9 | 3.5 | 11.0 | 12.9 | 6.7 | 38.3 |
| Public sector | -181.6 | -40.8 | 61.3 | -124.8 | 83.5 | 994.9 | 7.3 | 455.8 |
| Government | -1616.7 | -18.1 | 46.6 | -54.7 | 53.2 | 223.4 | 11.8 | 199.9 |
| Public organizations | -11.5 | -5.3 | -24.1 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Private sector | 12.7 | 41.1 | 24.6 | 6.4 | 6.1 | 4.9 | 6.7 | 26.4 |
| Other items net | -22.9 | 10.6 | -66.6 | -6.8 | -2.9 | -6.1 | -8.4 | -26.5 |
| **Broad money (M2X, end of period)** | 15.1 | 22.3 | 26.6 | -0.7 | 5.4 | 8.7 | 7.1 | 21.9 |
| Currency in circulation | 3.9 | 7.1 | 39.2 | -6.2 | 6.6 | 9.9 | 9.6 | 20.4 |
| Dram deposits | 16.7 | 13.9 | 57.9 | 2.0 | 9.3 | 14.5 | 9.0 | 39.2 |
| FX deposits | 27.0 | 39.7 | 7.2 | 3.0 | 2.6 | 4.8 | 3.6 | 14.7 |
| **Dram broad money (M2, end of period)** | 7.5 | 9.2 | 45.2 | -3.3 | 7.6 | 11.6 | 9.4 | 27.0 |
| **Note:** | | | | | | | | |
| Broad money (M2X, average) | 22.9 | 18.7 | 28.7 | 2.4 | 4.2 | 10.9 | 7.2 | 23.7 |
| Dram broad money (M2, average) | 33.3 | 6.1 | 34.2 | 1.2 | 5.2 | 8.5 | 9.3 | 31.6 |
| Broad money velocity (GDP/M2X, average)* | -3.0 | -1.7 | -9.9 | -13.2 | -10.8 | -2.1 | -6.1 | -7.5 |
| Dram broad money velocity (GDP/M2, average)* | -10.5 | 10.0 | -13.6 | -23.7 | -15.2 | -6.9 | -9.4 | -13.1 |
| Money multiplier (M2X)** | -1.7 | 11.0 | -5.4 | 4.0 | 0.6 | 0.0 | 0.3 | -3.6 |
| Dram multiplier (M2)** | 6.5 | -0.8 | -1.4 | 2.7 | 1.6 | 3.0 | 2.3 | 2.6 |

** Money velocities are computed based on quarterly adjusted indicators, while their change is computed against the respective quarter of the previous year.*
*** Money multipliers are computed using average quarterly indicators.*

# Monetary base

*(mln drams)*

| | 2003 *(actual)* | 2004 *(actual)* | 2005 *(estimation)* | 2006 *(program)* Q I | Q II | Q III | Q IV | 2006 |
|---|---|---|---|---|---|---|---|---|
| **Net foreign assets, including KfW loans *,***** | 153802 | 149266 | 241102 | 238870 | 243162 | 257939 | 280945 | 280945 |
| o/w KfW | 8617 | 11088 | 11088 | 10726 | 11854 | 12982 | 14110 | 14110 |
| **Net foreign assets** | 162419 | 160354 | 252190 | 249596 | 255016 | 270921 | 295055 | 295055 |
| **Net domestic assets ***** | -35216 | -17216 | -53868 | -60960 | -55357 | -54142 | -61312 | -61312 |
| Net lending | -22907 | -25990 | -29830 | -62598 | -56915 | -55143 | -60785 | -60785 |
| Net claims on the banking system ** | 8894 | 10857 | 5616 | 5616 | 6744 | 7872 | 9000 | 9000 |
| O/w KfW | 8700 | 11777 | 11777 | 11777 | 12905 | 14033 | 15161 | 15161 |
| Net claims on the Government | -31507 | -36847 | -35446 | -42983 | -35905 | -21516 | -23044 | -23044 |
| CBA securities | | | -26752 | -25232 | -27754 | -41499 | -46741 | -46741 |
| **Other items net ***** | -12309 | 8774 | 2713 | 1639 | 1557 | 1001 | -527 | -527 |
| **Monetary base (end of period)** | 118586 | 132050 | 187234 | 177910 | 187804 | 203797 | 219633 | 219633 |
| Currency outside CBA | 96838 | 105534 | 144687 | 136167 | 144673 | 158203 | 172708 | 172708 |
| Correspondent accounts with CBA | 21748 | 26516 | 42547 | 41743 | 43131 | 45594 | 46925 | 46925 |
| **Note:** | | | | | | | | |
| Monetary base (period average) | 102366 | 109491 | 148975 | 176540 | 182857 | 195801 | 209297 | 191124 |
| *Percentage change* | | | | | | | | |
| **Net foreign assets, including KfW loans *** | 17.8 | -2.9 | 61.5 | -0.9 | 1.8 | 6.1 | 8.9 | 16.5 |
| **Net domestic assets** | -82.1 | 51.1 | -212.9 | -13.2 | 9.2 | 2.2 | -13.2 | -13.8 |
| Net lending | -3463.8 | -13.5 | -14.8 | -109.9 | 9.1 | 3.1 | -10.2 | -103.8 |
| Net claims on the banking system | -14.4 | 22.1 | -48.3 | 0.0 | 20.1 | 16.7 | 14.3 | 60.3 |
| O/w KfW | 20.8 | 35.4 | 0.0 | 0.0 | 9.6 | 8.7 | 8.0 | 28.7 |
| Net claims on the Government | -224.4 | -16.9 | 3.8 | -21.3 | 16.5 | 40.1 | -7.1 | 35.0 |
| Other items net | 38.5 | 171.3 | -69.1 | -39.6 | -5.0 | -35.7 | -152.7 | -119.4 |
| **Monetary base (end of period)** | 6.6 | 11.4 | 41.8 | -5.0 | 5.6 | 8.5 | 7.8 | 17.3 |
| Currency outside CBA | 5.2 | 9.0 | 37.1 | -5.9 | 6.2 | 9.4 | 9.2 | 19.4 |
| Correspondent accounts with CBA | 13.4 | 21.9 | 60.5 | -1.9 | 3.3 | 5.7 | 2.9 | 10.3 |
| 12-month monetary base growth | 6.6 | 11.4 | 41.8 | 43.9 | 24.5 | 17.2 | 17.3 | 17.3 |
| **Note:** | | | | | | | | |
| Monetary base (period average) | 25.1 | 7.0 | 36.1 | -1.6 | 3.6 | 7.1 | 6.9 | 28.3 |

** Loans from KfW are included in NFAs as foreign liabilities and are not included in "Other items net".*
*** Loans to the CBA from KfW are included in "Net foreign assets" as foreign liabilities. Such funds lent to commercial banks by the CBA are included in "Bank liabilities".*
**** Money multipliers are computed using average quarterly indicators.*

# Financial flows (2003-2006)

| | | Domestic economy | | | External sector | Statistical deviation | Horizontal review |
|---|---|---|---|---|---|---|---|
| | | Private | Government | Banking | | Private | Government |
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| | **Gross disposable income** | | | | | | |
| | 2003 | 1610629 | 194541 | | | | 257570 |
| | 2004 | 1860370 | 228697 | | | | 267285 |
| | 2005 | 2128247 | 283561 | | | | 426918 |
| | 2006 | 2432595 | 304007 | | | | 550751 |
| | **Consumption** | | | | | | |
| | 2003 | -1353059 | -165831 | | | | |
| | 2004 | -1593085 | -203443 | | | | |
| | 2005 | -1701329 | -223801 | | | | |
| | 2006 | -1881845 | -242255 | | | | |
| | **Capital investment** | | | | | | |
| | 2003 | -300910 | -93195 | | | | |
| | 2004 | -383879 | -69974 | | | | |
| | 2005 | -542063 | -77660 | | | | |
| | 2006 | -633543 | -127384 | | | | |
| | **Export of goods and non-factor services** | | | | | | |
| | 2003 | | | | -522909 | | |
| | 2004 | | | | -525344 | | |
| | 2005 | | | | -591632 | | |
| | 2006 | | | | -611255 | | |
| | **Import of goods and non-factor services** | | | | | | |
| | 2003 | | | | 813383 | | |
| | 2004 | | | | 814923 | | |
| | 2005 | | | | 873361 | | |
| | 2006 | | | | 927461 | | |
| | **½Net factor income** | | | | | | |
| | 2003 | | | | -54029 | | |
| | 2004 | | | | -19573 | | |
| | 2005 | | | | -37728 | | |
| | 2006 | | | | -46137 | | |
| | **Net transfers** | | | | | | |
| | 2003 | | | | -126449 | | |
| | 2004 | | | | -176214 | | |
| | 2005 | | | | -174537 | | |
| | 2006 | | | | -174092 | | |
| 1 | **Non-financial balance *** | | | | | | |
| | 2003 | -43340 | -64485 | | 109997 | 2172 | 0 |
| | 2004 | -116594 | -44720 | | 93792 | -67523 | 0 |
| | 2005 | -115145 | -17900 | | 69465 | -63580 | 0 |
| | 2006 | -82793 | -65632 | | 95977 | -52448 | 0 |
| 2 | **Net lending by the Government** | | | | | | |
| | 2003 | 14894 | -14894 | | | | 0 |
| | 2004 | 10301 | -10301 | | | | 0 |
| | 2005 | 8431 | -8431 | | | | 0 |
| | 2006 | 17046 | -17046 | | | | 0 |
| | | *1* | *2* | *3* | *4* | *5* | *6* |
| 3 | **Domestic non-banking funding to the Government** | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | 2003 | -1605 | 1605 | | | | 0 |
| | 2004 | 776 | -776 | | | | 0 |
| | 2005 | -3200 | 3200 | | | | 0 |
| | 2006 | -21144 | 21144 | | | | 0 |
| 4 | **External funding of the Government **** | | | | | | |
| | 2003 | | 77752 | | -77752 | | 0 |
| | 2004 | | 33729 | | -33729 | | 0 |
| | 2005 | | 19432 | | -19432 | | 0 |
| | 2006 | | 43252 | | -43252 | | 0 |
| 5 | **External funding of the private sector** | | | | | | |
| | 2003 | 77731 | | | -77731 | | 0 |
| | 2004 | 70769 | | | -70769 | | 0 |
| | 2005 | 115605 | | | -115605 | | 0 |
| | 2006 | 88563 | | | -88563 | | 0 |
| 6 | **Change in net foreign assets of the banking system** | | | | | | |
| | 2003 | | | -45487 | 45487 | | 0 |
| | 2004 | | | -10706 | 10706 | | 0 |
| | 2005 | | | -65572 | 65572 | | 0 |
| | 2006 | | | -35838 | 35838 | | 0 |
| 7 | **Domestic lending of the banking system** | | | | | | |
| | 2003 | 10716 | -16502 | 5786 | | | 0 |
| | 2004 | 39106 | -3027 | -36079 | | | 0 |
| | 2005 | 33004 | 6406 | -39411 | | | 0 |
| | 2006 | 44118 | 18402 | -62520 | | | 0 |
| 8 | **Change in broad money** | | | | | | |
| | 2003 | -30610 | | 30610 | | | 0 |
| | 2004 | -51974 | | 51974 | | | 0 |
| | 2005 | -75914 | | 75914 | | | 0 |
| | 2006 | -79118 | | 79118 | | | 0 |
| | **Change in other items net** | | | | | | |
| | 2003 | -15451 | 6360 | 9091 | | | 0 |
| | 2004 | 5332 | -143 | -5189 | | | 0 |
| | 2005 | -29068 | 0 | 29068 | | | 0 |
| | 2006 | -19243 | 3 | 19240 | | | 0 |
| 10 | **Vertical review ***** | | | | | | |
| | 2003 | 10164 | -10164 | 0 | | | 0 |
| | 2004 | 25238 | -25238 | 0 | | | 0 |
| | 2005 | -2707 | 2707 | 0 | | | 0 |
| | 2006 | -122 | 122 | 0 | | | 0 |

** Involves a difference between savings and investments by individual sectors, the grand total of which is the deficit of the current account of the balance of payments.*

*** The 2003 Lincy Fund's resources are computed as capital transfers and are included in the sources of external financing of the budget deficit.*

**** Deviations from the vertical review are due to the difference in the indicator on lending to the Government by the banking system, provided from bank balance sheets and state budget statistics.*

# Real GDP Growth and GDP Deflator Forecast Methodology

The real GDP growth and GDP deflator were forecast by sectors of the economy. First, both the real growth and the deflator were forecast for individual sectors (industry, agriculture, construction, services) and net indirect taxes. Then, the real GDP growth was computed by the following identity:

$$(I_{-1}/GDP_{-1}) \times I + (A_{-1}/GDP_{-1}) \times A + (C_{-1}/GDP_{-1}) \times C + (S_{-1}/GDP_{-1}) \times S + (T_{-1}/GDP_{-1}) \times T = \text{GDP growth},$$

where:

*I* is real industry growth rate forecast for 2006;

*A* is real agriculture growth rate forecast for 2006;

*C* is real construction growth rate forecast for 2006;

*S* is real services growth rate forecast for 2006;

*T* is real net indirect taxes growth rate forecast for 2006.

The GDP deflator is computed using the logic of the above identity, with the difference being that the sector deflators are taken instead of real growth.

The real growth of the sectors of the economy and deflators were forecast through the adaptive forecasting method which is provided in detail in the Monetary Policy Program 2005.

**Real GDP growth and deflator forecasts by sectors of the economy**

| Yielding | Indicators | Value added (mln drams) | | | | | |
|---|---|---|---|---|---|---|---|
| | | Industry | Agriculture | Construction | Services | Net taxes | GDP |
| 1 | January-December 2005 | 423916.5 | 445851.2 | 440481.9 | 711229.8 | 178921.0 | 2200400.4 |
| 2 = 1/GDP nom. | Share in GDP | 0.19 | 0.20 | 0.20 | 0.32 | 0.08 | |
| 3 | **Real growth forecast, 2006** | **106.3** | **104.0** | **120.0** | **110.0** | **109.0** | **110.0** |
| 4 = (3 – 100) x 2 | Contribution to growth | 1.2 | 0.8 | 4.0 | 3.2 | 0.7 | 10.0 |
| 5 = 1 x 3/100 | Real GDP | 451047.2 | 463685.3 | 528578.2 | 782352.8 | 195023.9 | 2420687.3 |
| 6 = 5/GDP real | Share in GDP | 0.19 | 0.19 | 0.22 | 0.32 | 0.08 | |
| 7 | **Deflators forecast, 2006** | **106.6** | **104.9** | **103.5** | **102.3** | **104.0** | **104.0** |
| 8 = 6 x (7 - 100) | Share in deflator | 1.24 | 0.97 | 0.73 | 0.74 | 0.32 | 4.0 |
| 9 = 1 x 3 x 7/10000 | Nominal GDP | 480734.2 | 486550.9 | 547336.0 | 799957.8 | 202787.1 | 2517365.9 |

# Real Private Consumption Expenditure Forecast Methodology

Private consumption was forecast as a function of GDP. The forecasts were made by the ADL (Autoregressive Distributed Lags) model using the indicators adjusted through the Tremo/Seats Method (see Table 4.1). The unadjusted figures were calculated using the seasonal coefficients on the obtained forecasts.

***Table 4.1. Results of regression analysis of real GDP and real private consumption expenditures****

| Dependent variable \ Independent variable | C intercept | First difference of real GDP | Real private consumption (previous quarter) | Real GDP (previous quarter) | Ratio of determination ($R^2$) |
|---|---|---|---|---|---|
| The first difference of real private consumption expenditures | 2.53<br>(3.33) ** | 0.65<br>(2.91) | -0.75<br>(-3.89) | 0.54<br>(3.82) | 0.44 |

**All variables are expressed in logarithms.*

***The figure in parenthesis is the value of T statistic.*

# Real Private Capital Investments Forecast Methodology

The estimation of the relationship between the real private capital investments and the real GDP was also made by the ADL (Autoregressive Distributed Lags) regression model using the indicators adjusted by the Tremo/Seats Method (see Table 4.2). The unadjusted indicators were calculated using the seasonal coefficients on the obtained forecasts.

***Table 4.2. Results of regression analysis of real GDP and real private capital investments****

| Dependent variable \ Independent variable | C intercept | First difference of real GDP | Real capital investments (previous quarter) | Real GDP (previous quarter) | Ratio of determination (R2) |
|---|---|---|---|---|---|
| The first difference of real private capital investments | -7.46<br>(3.29) ** | 1.50<br>(1.91) | -0.77<br>(-3.90) | 1.24<br>(3.78) | 0.41 |

**All variables are expressed in logarithms.*

***The figure in parenthesis is the value of T statistic.*

# Fiscal Indicators Programming Methodology

As official actual indicators on the consolidated budget for 2005 are missing, the CBA's estimations of the consolidated budget were used in the monetary program. These estimations were based on the first nine months' trends for actual state budget performance and financial flows expected in the fourth quarter, and on strictly primary data of the local and social security fund budgets.

The source for indicators of the consolidated budget 2006 was the Republic of Armenia Law on the State Budget 2006. The quarterly distribution of the 2004-2005 budgets and the CBA expert estimations served as a basis for setting the quarterly proportions of fiscal indicators.

## Fiscal impulse indicator

The fiscal impulse indicator was used to evaluate the fiscal policy impact on the overall demand and, therefore, the prices. The fiscal impulse indicator represents the sum of the budget revenue impulse and the expenditures impulse, and is calculated by the formula as follows:[1]

$$FI_t = FI^T_t + FI^G_t = ( t_0 - \Delta T_t/\Delta Y_t)*\Delta Y_t + (\Delta G_t /\Delta PY_t - g_0)*\Delta PY_t$$

*where:*

| | |
|---|---|
| $FI$, $FI^T_t$, $FI^G_t$ | *are the fiscal, revenue and expenditure impulses, respectively,* |
| $t_0$, $g_0$ | *are the revenue/GDP and expenditures/GDP ratios, respectively, in the base period,* |
| $T_t$, $G_t$ | *are the revenue and expenditure levels, respectively, in the current period,* |
| $Y_t$, $PY_t$ | *are the nominal and potential GDP levels, respectively, in the current period.* |

According to the estimated fiscal impulses for 2005 and 2006, the following results were produced:

| Indicator | Revenue impulse | Expenditures impulse | Fiscal impulse |
|---|---|---|---|
| 2005 | | | |
| Annual (preliminary) | 0 | 0.4 | 0.4 |
| 2006 | | | |
| Annual (program) | -0.3 | 1.5 | 1.2 |

Indicators in the table show that as a result of the execution of the budget program in 2006, aggregate demand will be stimulated by 1.2%[2].

[1] *The detailed methodology of computation is provided in the annexes of the Monetary Policy Program 2000.*
[2] *The impulse indicators in the table are computed as a percentage of GDP.*

# Methodology to Forecast Movement in items "Goods" and "Services" of BoP Current Account

The approach for a forecast of items "Goods" and "Services" of the current account of the balance of payments was almost the same as for forecasts of indicators in the monetary policy programs in the past years. The quarterly data[1] on Armenia's foreign trade turnover serves as a basis for a forecast of "Goods" and "Services" of the BoP current account by commodity and service (inclusive of the period from 1996 to the second quarter, 2005).

In forecasting the export of the commodities, these commodities were broken down into two groups:

1. The forecast of the volume of commodities of the first group relied on the trends of the previous year. Economic growth in partner countries in recent years, investment in Armenia in 2005, and information on the anticipated developments in individual sectors of the economy were considered in the forecast. The increase (decrease) rate for each commodity in the group was computed. The indicator of such a rate was then multiplied by the 2005 data to produce the 2006 data. The above method was used to assess the volume of the commodities as follows:
   - Fats and oils,
   - Mineral production,
   - Goods of chemical production,
   - Plastic, rubber,
   - Skins and articles of leather,
   - Wood and articles of wood,
   - Paper and articles of paper,
   - Textile articles,
   - Footwear, umbrellas, headgear,
   - Stone, plaster, cement,
   - Machinery and equipment,
   - Industrial manufacturing,
   - Works of art and antiques,
   - Products of vegetable origin,
   - Products of prepared food,
   - Machinery and apparatus,
   - Transport means,
   - Base metals and articles thereof.

2. The second group comprised commodities, the turnover of which depends on public agreements or international private contracts. The group included item "Precious stones and metals" which is expected to report an increase in exports and imports over 2006.

For a forecast of imports, the commodities included in imports were grouped as follows:

1. *Consumer goods*, which include:

[1] *The commodity turnover data are taken from the NSSA bulletin and are presented in million of US Dollars.*

- Animals and products of animal origin,
- Products of vegetable origin,
- Products of prepared food, and
- Footwear, umbrellas, headgear.

The import of consumer goods was forecast as a function of the private sector's gross national disposable income, its previous year's level and the nominal exchange rate. The forecasts were made by the ADL regression model. In using the Seasonal Adjusting Additive Smoothing method, numerical series of dependent and independent variables, opted for regression, were smoothed, and then regression was made using smoothed series. The unadjusted figures were computed using the seasonal ratios after forecasts. The results of the regression analysis for imported consumer goods are presented in Table 6.1.1

**Table 6.1.1. Results of the regression analysis for imported consumer goods**

| Dependent variable \ Independent variable | C intercept | GNDI private (-3) lag | Previous quarter indicator of consumer goods imports | Nominal exchange rate | Ratio of determination ($R^2$) |
|---|---|---|---|---|---|
| Import of consumer goods | 34.28<br>(2.08)* | 0.017<br>(4.01) | 0.565<br>(4.53) | -0.051<br>(-2.16) | 0.93 |

**The figure in parenthesis is the value of T statistics.*

2. *Raw goods,* which include:
   - Mineral production,
   - Goods of chemical production,
   - Plastic, rubber,
   - Skins and articles of leather,
   - Wood and articles of wood,
   - Paper and articles of paper,
   - Stone, plaster, cement,
   - Base metals and articles thereof.

Import of raw goods was forecasted as a function of GDP (as these commodities further contribute to the process of production in the domestic economy and thus contribute to the GDP) and its previous lag. Services, which do not consume raw materials, and net indirect taxes were excluded from GDP. The forecasts were made through the ADL model.

**Table 6.1.2. Results of the regression analysis for imported ores and minerals**

| Dependent variable \ Independent variable | C intercept | GDP (net) | Import of ores and minerals (-1) lag | Ratio of determination ($R^2$) |
|---|---|---|---|---|

| | | | | |
|---|---|---|---|---|
| Import of raw goods | 32.5<br>(3.91)* | 0.058<br>(8.00) | 0.46<br>(4.89) | 0.86 |

* *The figure in parenthesis is the value of T statistics.*

3. *Investment goods*: the forecast for the import of these goods was based on the trends of previous years and the 2006 economic activity, and information on expected foreign investment. Investment goods include:
   - Machinery and equipment,
   - Machinery and apparatus.

4. *Precious stones and metals* were forecast taking into account the volume of these exports executed on a contractual basis, and information on the possible extension of output of the sector.

5. *Other goods*, which include the commodity groups not included in the above items. The forecast for the exports was based on the trends of the previous years. These goods are:
   - Products of vegetable origin,
   - Textile articles,
   - Transport means,
   - Industrial manufacturing,
   - Works of art and antiques.

The forecasts for individual commodities are presented in the data as Exports (FOB) and Imports (CIF), as the existing statistics on the commodities is expressed in FOB prices for exports, and CIF prices for imports. The monetary policy program relied on this data to evaluate the Exports (credit) and the Imports (debit) data in the following manner:

- The balance of payments data for 2002-2005 were used to calculate the ratios for Exports (credit)/Exports (FOB), and for Imports (debit)/Imports (CIF). The forecast for "Commodities" for 2006 is based on the average ratio from 2002 to 2005. The calculation is provided in the table;
- The forecasted Exports (FOB) of US$ 1083 million, and Imports (CIF) of US$ 2030 million, were multiplied by the ratios above to produce the result for the amount of the Exports (credit) of US$ 1106 million and the Imports (debit) of USD 1802 million.

**Table 6.1.3. Methodology to evaluate Exports (credit) and Imports (debit) data using the Exports (FOB) and Imports (CIF) data**

| | 2002<br>*(actual)* | 2003<br>*(actual)* | 2004<br>*(actual)* | 2005<br>*(estimation)* | 2006<br>*(program)* |
|---|---|---|---|---|---|
| **Exports (credit)** | 514 | 696 | 738 | 985 | 1,106 |
| **Exports (FOB)** | 505 | 686 | 723 | 962 | 1,083 |
| **Ratio** | 1.021 | 1.015 | 1.021 | 1.024 | 1.021 |
| | | | | | |
| **Imports (debit)** | 883 | 1,130 | 1,196 | 1,548 | 1,802 |
| **Imports (CIF)** | 987 | 1,279 | 1,351 | 1,743 | 2,030 |

| | | | | | |
|---|---|---|---|---|---|
| **Ratio** | 0.894 | 0.883 | 0.886 | 0.888 | 0.888 |

The forecast for the export of non-factor services was made as follows: the non-factor services were grouped into the below segments:

- Transport means,
- Travel,
- Computer and IT services,
- Other non-factor services.

For each sector, the forecast covered the exports based on the previous trends and considering the dynamics of these exports. The forecast also considered the development prospects. The exports of all four groups were then added to achieve an assessment of the total exports of the non-factor services.

The imports of the non-factor services were forecast as a function of the imports of the goods and the private sector's gross national disposable income (GNDI). The results of the regression analysis are presented in Table 6.1.4. below:

**Table 6.1.4. Regression analyses for imported services**

| Independent variable / Dependent variable | C intercept | Imports of goods | GNDI private | Ratio of determination ($R^2$) | Durbin-Watson statistics |
|---|---|---|---|---|---|
| *Imports of services* | 13.49 (3.42)* | 0.133 (5.99) | 0.016 (3.14) | 0.90 | 1.87 |

** The figure in parenthesis is the value of T statistics.*

**Table 6.1.5. Exports, mln US Dollars**

| | | 2003 *(actual)* | 2004 *(actual)* | 2005 *(estim.)* | 2006 *(progr.)* | 04/03 | 05/04 | 06/05 |
|---|---|---|---|---|---|---|---|---|
| 1 | Animals and products of animal origin | 6 | 6 | 8 | 10 | 9% | 21% | 32% |
| 2 | Products of vegetable origin | 3 | 7 | 11 | 13 | 138% | 49% | 17% |
| 3 | Fats and oils | 0 | 0 | 0 | 0 | -66% | 390% | 36% |
| 4 | Products of prepared food | 72 | 69 | 89 | 100 | -4% | 28% | 12% |
| 5 | Mineral production | 50 | 100 | 83 | 88 | 98% | -16% | 5% |
| 6 | Goods of chemical production | 3 | 2 | 2 | 3 | -32% | 19% | 24% |
| 7 | Plastic, rubber | 5 | 10 | 4 | 6 | 111% | -56% | 35% |
| 8 | Skins and articles of leather | 1 | 1 | 1 | 1 | 51% | 7% | -23% |
| 9 | Wood and articles of wood | 2 | 2 | 2 | 2 | 2% | 8% | 4% |
| 10 | Paper and articles of paper | 1 | 1 | 4 | 5 | 46% | 188% | 5% |
| 11 | Textile articles | 31 | 44 | 41 | 43 | 41% | -6% | 3% |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 12 | Footwear, umbrellas, headgear | 0 | 0 | 0 | 0 | -22% | 15% | 76% |
| 13 | Stone, plaster, cement | 2 | 3 | 4 | 17 | 81% | 41% | 315% |
| 14 | Precious stones and metals | 351 | 299 | 357 | 389 | -15% | 19% | 9% |
| 15 | Base metals and articles thereof | 90 | 138 | 311 | 360 | 52% | 126% | 16% |
| 16 | Machinery and equipment | 20 | 22 | 21 | 22 | 9% | -4% | 7% |
| 17 | Transport means | 15 | 9 | 10 | 12 | -35% | 6% | 19% |
| 18 | Machinery and apparatus | 31 | 7 | 9 | 11 | -77% | 33% | 16% |
| 19 | Industrial manufacturing | 2 | 1 | 1 | 1 | -32% | 21% | -33% |
| 20 | Works of art and antiques | 1 | 0 | 0 | 0 | -78% | 73% | -19% |
| | **Total (FOB)** | **686** | **723** | **962** | **1.083** | **5%** | **33%** | **13%** |
| | **Total (credit)** | **696** | **738** | **985** | **1.106** | **6%** | **33%** | **12%** |

**Table 6.1.6. Imports, mln US Dollars**

| | | **2003** *(actual)* | **2004** *(actual)* | **2005** *(estim.)* | **2006** *(progr.)* | **04/03** | **05/04** | **06/05** |
|---|---|---|---|---|---|---|---|---|
| 1 | Animals and products of animal origin | 33 | 40 | 50 | 60 | 23% | 23% | 20% |
| 2 | Products of vegetable origin | 75 | 109 | 96 | 114 | 45% | -12% | 18% |
| 3 | Fats and oils | 23 | 21 | 23 | 28 | -9% | 12% | 20% |
| 4 | Products of prepared food | 93 | 113 | 153 | 184 | 21% | 36% | 20% |
| 5 | Mineral production | 179 | 209 | 276 | 312 | 17% | 32% | 13% |
| 6 | Goods of chemical production | 78 | 85 | 106 | 120 | 9% | 24% | 13% |
| 7 | Plastic, rubber | 29 | 36 | 48 | 54 | 24% | 35% | 13% |
| 8 | Skins and articles of leather | 2 | 2 | 2 | 3 | 10% | 25% | 12% |
| 9 | Wood and articles of wood | 9 | 10 | 12 | 13 | 9% | 22% | 12% |
| 10 | Paper and articles of paper | 20 | 25 | 27 | 31 | 22% | 9% | 13% |
| 11 | Textile articles | 40 | 47 | 48 | 57 | 18% | 2% | 18% |
| 12 | Footwear, umbrellas, headgear | 4 | 5 | 7 | 9 | 20% | 41% | 20% |
| 13 | Stone, plaster, cement | 22 | 22 | 29 | 33 | 1% | 30% | 12% |
| 14 | Precious stones and metals | 333 | 292 | 373 | 394 | -12% | 28% | 6% |
| 15 | Base metals and articles thereof | 77 | 61 | 91 | 103 | -21% | 50% | 13% |
| 16 | Machinery and equipment | 134 | 136 | 190 | 262 | 1% | 40% | 38% |
| 17 | Transport means | 78 | 93 | 149 | 176 | 18% | 61% | 18% |
| 18 | Machinery and apparatus | 34 | 29 | 39 | 53 | -16% | 35% | 38% |
| 19 | Industrial manufacturing | 15 | 18 | 19 | 23 | 16% | 9% | 18% |
| 20 | Works of art and antiques | 0 | 0 | 3 | 4 | -94% | 21936% | 18% |
| | **Total (CIF)** | **1.279** | **1.351** | **1.743** | **2.030** | **6%** | **29%** | **16%** |
| | **Total (debit)** | **1.130** | **1.196** | **1.548** | **1.802** | **6%** | **29%** | **16%** |

# Real Effective Exchange Rate

The real effective exchange rate for the Armenian economy will be calculated according to the model provided in Annex 9. It then was estimated using a design mathematic formula, by individual components, as follows:

$$REER_i = \prod_{i \neq j} \left[ \frac{ER_i \times CPI_i}{ER_j \times CPI_j} \right]^{W_{ij}}$$

where:

$\Pi$ is product,

REER is real effective exchange rate of i country,

CPI are consumer price indices of i and j countries,

ER are direct nominal exchange rates of i and j countries in US Dollars (e.g. AMD 1 or RUR 1 presented in US Dollars),

$W_{ij}$ are competitive weights, which are based on the volume of trade turnover of i and j countries, and are assessed as follows:

$$W_{ij} = \frac{E_{xij} + I_{mij}}{E_{xi} + I_{mi}}$$

where:

$E_{xij}$, $I_{mij}$ is trade turnover between i and j countries (exports and imports),

$E_{xi}$, $I_{mi}$ is volume of exports and imports of i country.

These formulas show that an increase in the CPI and nominal exchange rate of the country i or their decrease in partner countries would appreciate REER of the present country, which implies better terms for the imports, and worse for the exports.

The REER for the Armenian Dram was assessed using the data on the average weight of the partner countries involved in foreign trade turnover during the period from 1999 to 2003. Humanitarian aid, natural gas and oil product and diamonds values were excluded from imports, and only diamonds was excluded from exports, as their prices are considered to be relatively inelastic to price changes.

Once the real exchange rate is forecasted, and given the 2006 estimations for inflation and exchange rate indicators of the partner

countries, as well as a forecasted level of the Armenia's inflation, the AMD/USD nominal exchange rate has been produced as a remaining sum. The weights for the calculation of the real exchange rate and the country contributions for the period 1998 to 2006 are provided in Table 6.2.1.

**Table 6.2.1. Weights for the calculation of the real effective exchange rate and country impacts**

| | **1998** *(actual)* | **1999** *(actual)* | **2000** *(actual)* | **2001** *(actual)* | **2002** *(actual)* | **2003** *(actual)* | **2004** *(actual)* | **2005** *(estim.)* | **2006**[1] *(progr.)* | **Weight** |
|---|---|---|---|---|---|---|---|---|---|---|
| REER (1997=100) | 107.4 | 112.3 | 111.9 | 108.0 | 98.4 | 88.4 | 91.4 | 98.9 | 106.3 | |
| | 7.4% | 4.5% | -0.4% | -3.5% | -8.9% | -10.2% | 3.4% | 8.2% | 7.5% | |
| Armenia's inflation | 8.8% | 0.7% | -0.8% | 3.2% | 1.1% | 4.7% | 7.0% | 0.7% | 2.1% | |
| Dram exchange rate[2] | -2.9% | -5.6% | -0.8% | -2.8% | -3.2% | -0.9% | 8.8% | 16.2% | 9.0% | |
| **Partner countries' inflation contribution**[3] | -10.3% | -18.5% | -9.9% | -8.9% | -7.6% | -6.9% | -5.8% | -6.9% | -6.2% | |
| United Kingdom | -0.2% | -0.1% | -0.2% | -0.1% | -0.1% | -0.2% | -0.2% | -0.2% | -0.1% | 7.2% |
| Switzerland | 0.0% | 0.0% | -0.1% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | -0.1% | 3.7% |
| Iran | -1.9% | -2.2% | -1.6% | -1.3% | -1.6% | -1.8% | -1.6% | -2.0% | -2.0% | 11.9% |
| Russia | -4.3% | -12.4% | -3.8% | -3.9% | -3.0% | -2.6% | -2.1% | -2.4% | -2.1% | 20.5% |
| USA | -0.2% | -0.2% | -0.4% | -0.3% | -0.2% | -0.2% | -0.3% | -0.4% | -0.4% | 10.8% |
| Turkey | -3.2% | -2.6% | -2.3% | -2.2% | -2.0% | -1.2% | -0.4% | -0.4% | -0.4% | 5.3% |
| Euro-area | -0.3% | -0.4% | -0.7% | -0.7% | -0.7% | -0.7% | -0.7% | -0.7% | -0.6% | 32.1% |
| Georgia | -0.2% | -0.8% | -0.2% | -0.2% | -0.2% | -0.2% | -0.3% | -0.5% | -0.3% | 4.6% |
| Ukraine | -0.4% | -0.8% | -1.0% | -0.4% | 0.0% | -0.2% | -0.3% | -0.5% | -0.4% | 3.9% |
| **Partner countries' exchange rate contribution**[4] | 14.0% | 34.1% | 12.2% | 5.7% | 0.7% | -6.9% | -5.5% | -0.7% | 2.9% | |
| United Kingdom | -0.1% | 0.2% | 0.5% | 0.4% | -0.3% | -0.6% | -0.8% | 0.0% | 0.2% | 7.2% |
| Switzerland | 0.0% | 0.1% | 0.4% | 0.0% | -0.3% | -0.5% | -0.3% | 0.0% | 0.1% | 3.7% |
| Iran | 0.0% | 0.0% | 0.1% | -0.1% | 0.0% | 0.4% | 0.6% | 0.5% | 0.6% | 11.9% |
| Russia | 9.0% | 23.5% | 2.8% | 0.7% | 1.5% | -0.4% | -1.3% | -0.4% | 0.4% | 20.5% |
| USA | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 0.0% | 10.8% |
| Turkey | 2.9% | 2.5% | 2.2% | 3.5% | 1.2% | 0.0% | -0.3% | -0.3% | 0.2% | 5.3% |
| Euro-area | 0.4% | 1.6% | 4.8% | 0.9% | -1.6% | -5.7% | -3.0% | -0.1% | 1.2% | 32.1% |
| Georgia | 0.3% | 1.8% | -0.1% | 0.2% | 0.3% | -0.1% | -0.5% | -0.2% | 0.0% | 4.6% |

[1] *2005 forecasts are based on the figures of the ''World Economic Outlook'', September 2004 edition, and CBA estimations.*
[2] *Provides the AMD/USD exchange rate change, the increase of which implies an appreciation of the Dram.*
[3] *A negative impact on the real exchange rate of the Dram means inflation in a partner country, and a positive impact means deflation in a partner country.*
[4] *A negative impact on the real exchange rate of the Dram means appreciation of the currency of a partner country vis-à-vis the US Dollar, and a positive impact means depreciation of the currency of a partner country.*

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Ukraine | 1.0% | 2.1% | 1.1% | 0.0% | 0.0% | 0.0% | 0.0% | -0.1% | 0.0% | 3.9% |

# Export and Import Price Forecast Methodology

The forecast for the export and import prices was made using the BEC (Broad Economic Classification) classifier, which enables to review the commodity groups according to their economic significance.

**Table 6.3.1. BEC classifier group weights in imports**

| | 2000 *(actual)* | 2001 *(actual)* | 2002 *(actual)* | 2003 *(actual)* | 2004 *(actual)* | 2005 *(estimation)* |
|---|---|---|---|---|---|---|
| Consumer goods | 24.5% | 28.7% | 21.4% | 21.6% | 25.0% | 24.0% |
| Raw materials | 36.1% | 36.0% | 36.2% | 34.0% | 35.2% | 35.0% |
| Investment goods | 7.3% | 5.3% | 7.0% | 8.0% | 7.5% | 8.0% |
| Petroleum | 8.9% | 11.4% | 9.4% | 7.1% | 9.4% | 10.0% |
| Diamonds | 12.0% | 9.9% | 19.7% | 23.7% | 17.1% | 17.0% |
| Natural gas | 11.2% | 8.6% | 6.3% | 5.5% | 5.7% | 6.0% |

**Table 6.3.2. BEC classifier group weights in exports**

| | 2000 *(actual)* | 2001 *(actual)* | 2002 *(actual)* | 2003 *(actual)* | 2004 *(actual)* | 2005 *(estimation)* |
|---|---|---|---|---|---|---|
| Consumer goods | 30.5% | 25.8% | 22.3% | 20.5% | 21.7% | 20.0% |
| Raw materials | 44.9% | 40.2% | 34.8% | 33.6% | 44.9% | 50.0% |
| Investment goods | 5.8% | 6.8% | 3.6% | 2.6% | 2.3% | 2.0% |
| Diamonds | 18.8% | 27.2% | 39.2% | 43.2% | 31.0% | 28.0% |

The tables show that petroleum, diamonds, and natural gas were separated from the total imports, as prices on petroleum are directly linked to international prices, and the prices in international futures contracts served a basis for the forecast. Prices on natural gas are determined by interstate agreements, thus it remained unchanged for the forecast; prices on diamonds are also constant as they are imported for reprocessing and further export.

Previous trends for investment goods serve as a basis for the forecast, where the prices on investment goods (machinery and equipment) are constant.

The prices on raw material were viewed by commodities that hold key weights in the group. The prices were forecasted based on the futures quoting at world stock-exchanges and the world supply and demand dynamics (Table 6.3.3.):

**Table 6.3.3. Raw material weights in exports and imports**

| 2006 | Price change | Exports | Imports | Impact on export prices | Impact on import prices |
|---|---|---|---|---|---|
| Copper | -1.6% | 28.9% | | -0.5% | |
| Gold | 11.1% | 19.5% | 53.4% | 2.2% | 6.0% |

| | | | | | |
|---|---|---|---|---|---|
| Iron | 0.0% | 29.0% | | 0.0% | |
| Grain | 0.0% | | 46.6% | | 0.0% |
| Molybdenum | -12.8% | 22.6% | | -2.9% | |
| **Total** | | **100.0%** | **100.0%** | **-1.0%** | **6.0%** |

The forecast for prices on consumer goods relied on the methodology of the calculation of unit value per partner countries. According to the methodology, the export and import unit values of consumer goods are broadly determined by the inflation and exchange rate levels in the partner countries by weighing through the formula of geometric mean.

Because these countries are positioned differently in the export and import structure, the CBA used different methods for forecasting. So, if there is not a strict country concentration in the import of consumer goods, the EU, Russia and the USA account for the biggest share of export of consumer goods. The forecast of the import and export prices on consumer goods relied on the weight of the partner countries for 2003, the 2006 inflation and exchange rates, which are presented in Table 6.3.4. below:

**Table 6.3.4. Partner country weight in imports of consumer goods in 2003 and forecasts for 2006**

| Country | Import (%) | Export (%) | Inflation | Exchange rate | Impact on import prices | Impact on export prices |
|---|---|---|---|---|---|---|
| Euro-area | 22.9% | 19.5% | 1.8% | -3.8% | -0.5% | -0.4% |
| Iran | 4.9% | | 18.5% | -4.5% | 0.6% | |
| Panama | 5.3% | | 0.0% | 0.0% | 0.0% | |
| Russia | 22.0% | 53.8% | 10.7% | -1.8% | 1.9% | 4.6% |
| Switzerland | 5.2% | | 1.4% | -4.0% | -0.1% | |
| Turkey | 4.6% | | 7.0% | -8.3% | -0.1% | |
| UAE | 13.8% | | 0.0% | 0.0% | 0.0% | |
| Ukraine | 6.9% | | 12.1% | -1.0% | 0.7% | |
| United Kingdom | 9.1% | | 1.9% | -3.7% | -0.2% | |
| USA | 5.2% | 26.8% | 2.8% | 0.0% | 0.1% | 0.7% |
| **Total** | **100.0%** | **100.0%** | | | **3.2%** | **4.9%** |

In the country shares, the so-called "third country effect" can be observed, when goods are imported from a country that is not the producer of the goods (e.g. Panama, UAE). These countries were therefore viewed as "fictitious", keeping their inflation and exchange rates on a constant level. The inflation and exchange rate data of the other countries were taken from the IMF International Financial Statistics database, and the data of the IMF "World Economic Outlook" were used in the estimations.

In the outcome, the prices of commodity groups of imports and exports were weighed by shares of corresponding groups and then

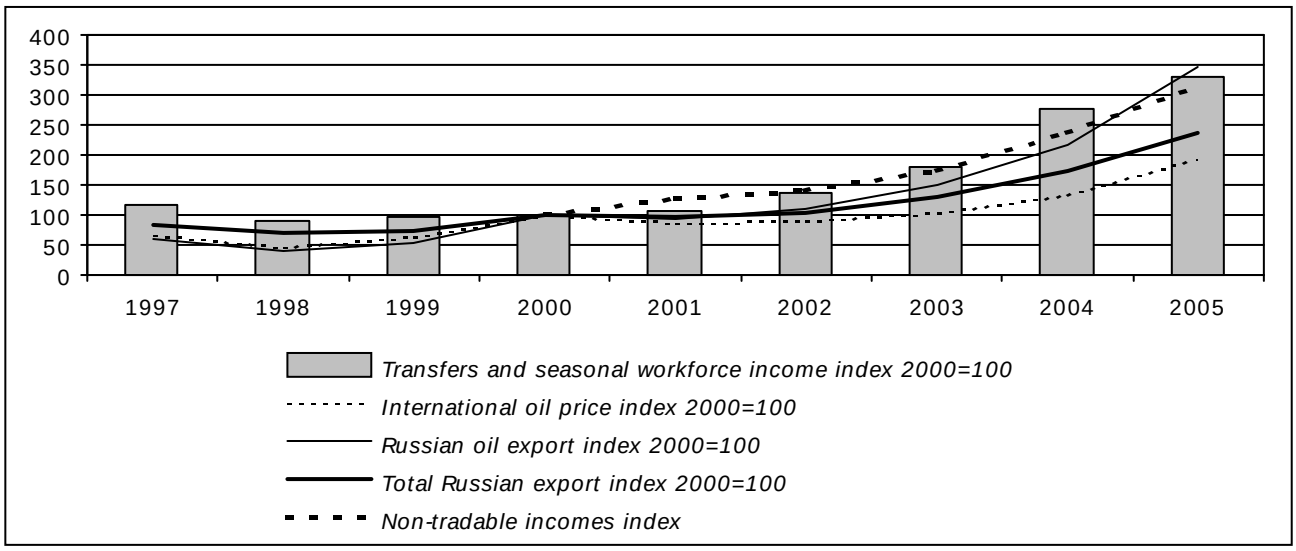
multiplied by the average quarterly AMD/USD exchange rate in order to produce the export and import prices in Dram terms.

# Forecast of Private Transfers and Income of Seasonal Workforce

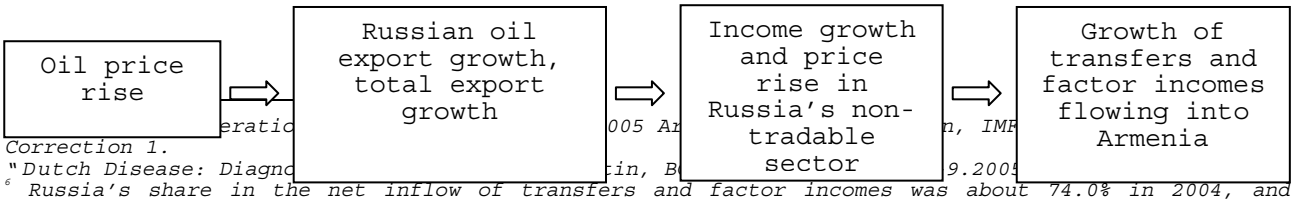
Although Russia is obviously benefiting in the recent years from high oil prices in world markets, the reliance of its economy on world oil prices is rising. Moreover, the Russian economy is starting to see symptoms of the "Dutch disease" that is reflected through real exchange rate appreciation and growing prices and incomes in construction and in service sectors[5]. These phenomena would possibly demonstrate themselves in the Armenian economy, too.

As well as being one of the main economic partners to Armenia, Russia is the principal source of private transfers and income of seasonal workforce in the factor incomes[6]. And, most importantly, Russia is a country where a prevailing part of the Armenian compatriots is employed in the non-tradable sector, i.e. trade and construction[7]. Considering the above circumstance and high transfers concentration, and that transfers are an essential factor in financing of current account and stimulating of domestic demand, it may be concluded that Armenia indirectly bears the consequences of such a disease.

**Chart 1** [8]




According to the chart, the inflowing transfers depend on international oil prices in the following logical chain[9]:




*eratic 005 Ar n, IMF Correction 1.*
*"Dutch Disease: Diagno tin, B 9.2005*

[6] *Russia's share in the net inflow of transfers and factor incomes was about 74.0% in 2004, and 80.8% in January-September, 2005.*

[7] *Source: the CBA's survey on disclosing the structure of transfers received from abroad on behalf of physical persons for non-commercial purposes.*

[8] *Incomes in the non-tradable sector in the period 1997-1999 are not included in the chart due to the lack of statistical data.*

[9] *Total private transfers and seasonal workforce income were used in the chart as the transfer and seasonal income indicators by country are for several years. Since Russia ranks atop in terms of net influx of pecuniary transfers, the total private transfers and seasonal workforce income may be used as a proxy indicator.*

1. The rise in oil prices leads to increased value of export of Russian oil (see Chart 1). The coefficient of correlation between the export of Russian oil and world oil prices is very close to 1, i.e. 0.986, while the average elasticity of the Russian oil export to the world oil prices in the period 2003-2005 is 1.7[10].

$$\Delta\%OE = a * \Delta\%OP \quad \textbf{(1)}$$

*where:*

*OE* is value of export of oil,
*OP* is world price of oil,
*a* is ratio of elasticity.

2. Increased oil export contributes to the growth in income and prices in the non-tradable sector. Chart 2 provides the dynamics of oil export and incomes in the non-tradable sector. That said, the nominal growth in the non-tradable sector (retail trade and construction) was taken as a proxy for income. This nominal growth was brought into dollar terms as the transfers inflowing from Russia are mainly in US dollars, and the growth of dollar income of the Armenian compatriots employed in the non-tradable sector is important.

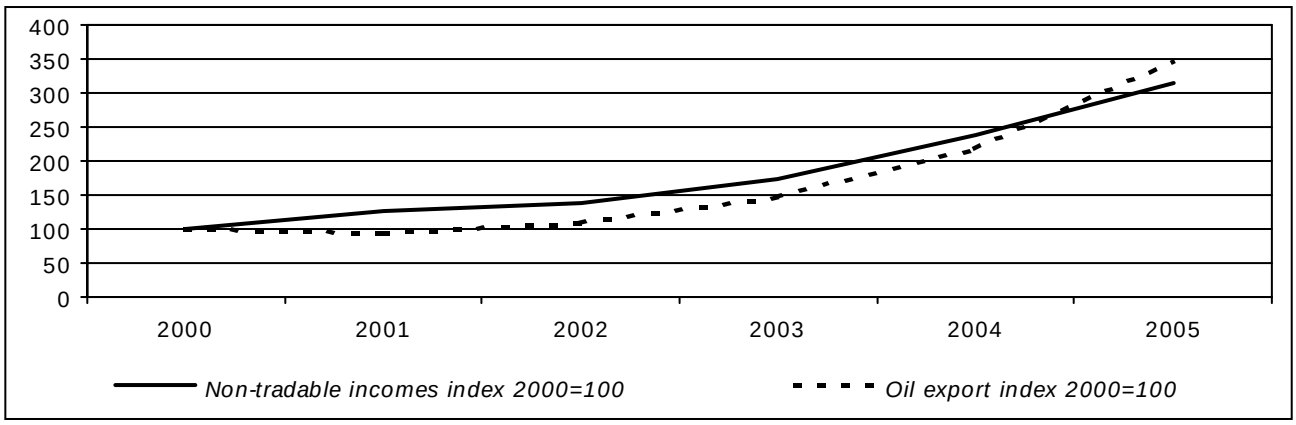
The coefficient of correlation between export of oil and incomes in the non-tradable sector equals 0.97, while average elasticity of incomes in the non-tradable sector to value of export of oil in the period 2003-2005 equals 0.67.

$$\Delta\%NTI = b * \Delta\%OE \quad \textbf{(2)}$$

*where:*

*NTI* is income in non-exportable area,
*OE* is volume of export of oil,
*b* is ratio of elasticity.

**Chart 2**




[10] *Making a regression analysis has not been possible due to short time series, therefore a simple approach of average elasticity computation was chosen.*

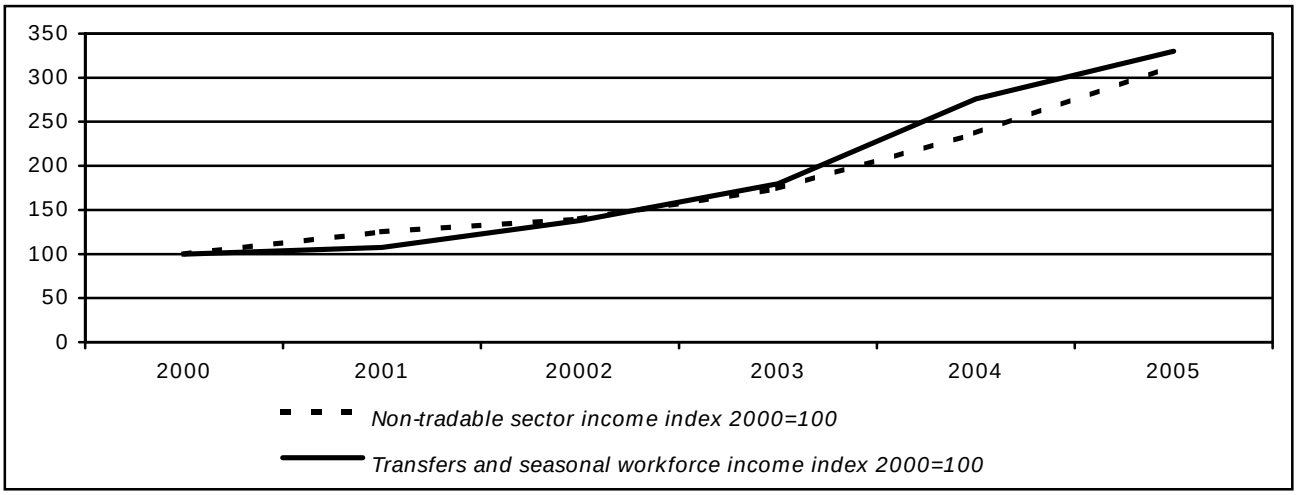
3. Economic activity in the non-tradable sector leads to growth of transfers and income of seasonal workforce from Russia (see Chart 3).

$$\Delta\%TR = c * \Delta\%NTI \quad (3)$$

*where:*

*TR* is Transfers and seasonal workforce income,
*NTI* is Income in non-exportable area,
*C* is Coefficient of elasticity.

**Chart 3**




By putting the first equation into the second one, then putting the produced result into the third equation, the following equation will be yielded:

$$\Delta\%TR = \Delta\%OP * a * b * c\,, \quad (4)$$

*where:*

*TR* is Transfers and seasonal workforce income,
*OP* is world oil price.

This equation measures the impact of oil prices on a change in transfers and seasonal workforce income. So, given the above logical chain, the change of the world oil prices may be used as a leading indicator in order to estimate the growth of transfers and seasonal workforce income from Russia.

These logical links were used for evaluation of transfers and seasonal workforce income for 2006. The IMF experts estimate that international oil prices in 2006 would average US$ 61.75 per barrel[11] or grow by 13.9%, and Russian oil exports would increase by 20.7%. It is anticipated that private transfers and seasonal workforce income would rise over 2006 by 15.4%.

Two more scenarios have been reviewed as well. The first (conservative) scenario provides that the growth of transfers would be

[11] *See the detailed estimations for international oil prices for 2006 in section 'External Sector', subparagraph 'Real effective exchange rate and external trade prices'.*

within 5.6% - 12.5% if world oil prices ranged within US$ 55-60 per barrel. The second anticipates that high oil prices would be increasingly persisting: the growth of transfers would be within 12.8% - 27.3% in case of US$ 60-70 per barrel.

Considering the dynamics of oil prices in world markets in the last two months, the first scenario with its upper choice of 12.5% has been adopted in the 2006 monetary policy program.

# Basic Monetary Indicators Forecast Methodology

The forecast for dram broad money for 2006 was made using the special case, i.e. the partial adjustment model of the Autoregressive Distributed Lags (ADL) model. A regression equation underlying the analysis is as follows:

$$M2_t = c + \alpha_1 M2_{t-1} + \beta_0 GDP_t + \gamma_0 DEF_t + \varepsilon_t \quad (1)$$

*where:*

*M2* is the real dram broad money (average quarterly),

*GDP* is the real GDP

*DEF* is the real GDP deflator.

Some simple mathematical modifications changed the equation, as follows:

$$\Delta M2_t = c + \beta_0 \Delta GDP_t + \gamma_0 \Delta DEF_t - (1-\alpha_1) M2_{t-1} + (\beta_0) GDP_{t-1} + (\gamma_0) DEF_{t-1} + \varepsilon_t \quad (2)$$

Before the modification, the review of the time series stationarity has revealed that each of these series is first order integrable on the first order I (1). In other words, the first difference time series ΔM2, ΔGDP and ΔDEF, which have been included in the equation above, are stationary I(0). The stationarity has been tested by the Dickey-Fuller test. Below are the results of the test for the time series ΔM2, ΔGDP and ΔDEF:

**ΔM2**

| | | | |
|---|---|---|---|
| ADF Test Statistic | - 3.910276 | 1% Critical Value* | -4.284580 |
| | | 5% Critical Value | -3.562882 |
| | | 10% Critical Value | -3.215267 |

**ΔGDP**

| | | | |
|---|---|---|---|
| ADF Test Statistic | - 3.487406 | 1% Critical Value* | -4.234972 |
| | | 5% Critical Value | -3.540328 |
| | | 10% Critical Value | -3.202445 |

**ΔDEF**

| | | | |
|---|---|---|---|
| ADF Test | - | 1% Critical | -3.626784 |

| | | |
|---|---|---|
| Statistic | 2.964137 | Value* |
| | | 5% Critical Value -2.945842 |
| | | 10% Critical Value -2.611531 |

The advantage of the model is that in addition to the ΔGDP and ΔDEF variables that describe short-term developments of the dram broad money, the equation has considered the components describing the long-term correlation as well. Before estimating the model, the existence of cointegration between the variables was tested. For simplicity, the equation (2) may be represented in terms of the Error Correction Model equation, as follows:

$$\Delta M2_t = \beta_0 \Delta GDP_t + \gamma_0 \Delta DEF - (1-\alpha_1)\left[ M2_{t-1} - \frac{c}{(1-\alpha_1)} - \frac{(\beta_0)}{(1-\alpha_1)} GDP_{t-1} - \frac{(\gamma_0)}{(1-\alpha_1)} DEF_{t-1} \right] + \varepsilon_t \quad (3)$$

In fact, the model shows that a change in the dram broad money reflects the influence of the current change in the real GDP deflator and an error correction component in the brackets. This component equals zero in case of long-term equilibrium. It will be non-zero in case of disequilibrium, and the coefficient (1 - α1) shows the speed of adjustment.

***Table 7.1. Results of the regression analysis****

| Independent variable / Dependent variable | First difference of real GDP (ΔGDP)*** | Real dram broad money indicator of previous quarter ($M2_{t-1}$) | Real GDP indicator of previous quarter ($GDP_{t-1}$) | First difference of real GDP deflator (ΔDEF) | Indicator of GDP deflator of previous quarter ($DEF_{t-1}$) | C intercept | Fictitious variable for Q1, 2003 | Fictitious variable for Q3, 2004 | Ratio of determination $R^2$ |
|---|---|---|---|---|---|---|---|---|---|
| First difference of real dram broad money (ΔM2) | 0.987* (8.861) ** | -0.508 (-5.587) | 0.969 (6.671) | -0.713 (-3.683) | -0.408 (-1.976) | -4.61 (-5.584) | 0.099 (3.807) | 0.111 (-4.368) | 0.895 |

** All variables are expressed in logarithms.*
*** The figure in parenthesis is the value of T statistic.*
**** GDP data are smoothed.*

# Comparative Analysis for Actual Monetary Base and Rule-Calculated Monetary Base

The monetary base forecasts for 2006, and its actual indicators of the previous years, are put into comparison with the McCallum Base Money rule-calculated monetary base indicators[1].

The above rule of monetary base management is formulized as follows:

$$b_t - b_{t-1} = \alpha - \frac{1}{16} * \left(Y_{t-1} - b_{t-1} - Y_{t-17} + b_{t-17}\right) + \lambda * \left(Y^* - Y\right)_{t-1}$$

*where **b** is the logarythm of the level of the monetary base, **Y** and **Y*** are the logarythms of the actual and potential GDP levels, respectively. All indiactors are taken on a quarterly basis.*

As seen, the growth of the monetary base is a function of the following three variables:

1. α is a constant, which is equal to the potential GDP growth. The potential growth of the nomional GDP (α) was evaluated using the trend approach, and it made up 2.84% quarterly.
2. The second component is set to adjust the growth of the monetary base according to the change in the smoothed money velocity. McCallum's proposal is to calculate it for each quarter using the average change in the behavior of the previous four years. Such a long period for averaging is used because the smoothing should reflect the impact of institutional, other than cyclical, changes on the velocity of money.
3. The third factor (λ coefficient) will make sure there is feedback between the GDP cyclical changes and the monetary policy. It accepts values placed within the range 0;1, and ensures the dynamic stability and equilibrium of the Rule. McCallum has assessed the optimal value of λ coefficient to be 0.25.
4. The potential GDP (Y*) was calculated as follows:

$$Y^* = 0.2*Y^*t-1 + 0.8*Yt-1 + 0.0284$$

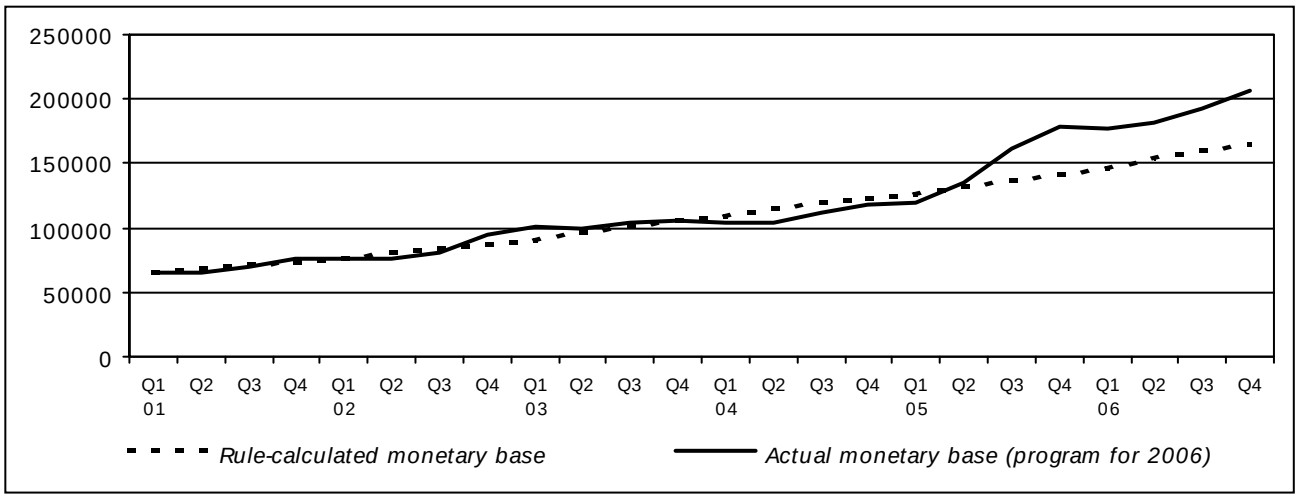
*where Y and Y* are the logarithms of the actual and trend GDPs.*

The growth of the actual monetary base in 2005 was notably faster in relation to the growth of the rule-calculated monetary base, determined however not by the rigorously expansionary monetary policy of the CBA but steeply grown demand for dram over 2005. The CBA has met such demand mostly bolstered by diminishing dollarization and rising dramization.

[1] *See Andrew G. Haldane, Bennett T. McCallum, Chris Salmon "Base Money Rules in the United Kingdom", Issued by the Monetary Analysis Division, Bank of England, 1996.*

The process has accelerated from the second half of the year, and will lead the average annual monetary base to grow at a high pace over 2006.

**Chart 8.1**




The growth rate of rule-calculated average annual monetary base for 2006 will be 16.7%, well below the program 27.2% due to the above-mentioned reason. Almost equal growth of rule-calculated and programmed monetary base levels at the end of the year correspond to such growth rates of average annual monetary base.

**Table 8.1. Actual monetary base and rule-calculated monetary base and nominal GDP growth rates in the period 2002-2006**

| **Year** | **Nominal GDP** *(actual)* | **Monetary Base** *(actual, 2006 program)* | **Nominal GDP** *(Rule)* | **Monetary Base** *(Rule)* |
|---|---|---|---|---|
| 2002 | 16.3 | 17.8 | 12.9 | 18.6 |
| 2003 | 19.3 | 25.0 | 13.6 | 20.0 |
| 2004 | 16.7 | 7.0 | 14.9 | 18.4 |
| 2005 | 14.4 | 36.1 | 13.6 | 14.7 |
| 2006 | 11.9 | 27.2 | 12.1 | 16.7 |

# Analysis of the Results of the Applied Model "Changes in Wages, Production and Prices in terms of International Trade"

The model is focused on comparing productivities and wages in Armenia and the rest of the world, and evaluating their impacts on output and relative prices [1].

Depending on the economic relations between Armenia and the rest of the world, the relative prices in the model are represented through the formula as follows:

$$\ln\left(\frac{P}{P^*}\right) = -\frac{1-\exp/GDP}{1-\exp/GDP+imp/GDP} \qquad (1)$$

*where:*

*P* is dollar price of domestic goods;

*P** is world prices in dollar terms;

$\exp/GDP$ is real export/GDP ratio;

$imp/GDP$ is real import/GDP ratio.

If we substitute Dollar prices of domestic goods by Dram prices times USD/AMD nominal exchange rate in the $\left(\frac{P}{P^*}\right)$, the real exchange rate will be produced. So, the real exchange rate can be used instead of the $\left(\frac{P}{P^*}\right)$ relationship. Since the formula includes total exports and total imports, rather than just trade relations with any partner country, the real effective exchange rate would be correct to insert:

$$\ln REER = -\frac{1-\exp/GDP}{1-\exp/GDP+imp/GDP} \qquad (2),$$ while

$$Z^H = \frac{1-\exp/GDP}{1-\exp/GDP+imp/GDP} \qquad (3),$$ of which $\ln REER = -Z^H$

$\ln REER$ is index of Armenian Dram's real effective exchange rate in logarithmic terms;

$Z^H$ is range of goods produced in the country.

The theoretical logic lies in the following: the relationship between the range of domestically produced goods and the relative prices is negative, that is the decrease in the range of domestically produced goods ($Z^H$) will lead to a price rise, and vice versa. The increase in domestically produced goods ($Z^H$) means that the imported goods are

[1] *The model is detailed in the CBA Q3 2003 report "Changes in wages, production and prices in terms of international trade".*

substituted by relatively cheap domestically produced goods, owing to comparative advantages obtained in the non-tradable sector of the economy.

According to the formula (1), export growth has a dual impact. On the one hand, the growth of exports, due to increasing productivity, will mean that the part of the non-tradable goods turns into tradable goods, owing to price advantages. On the other hand, the productivity growth in the tradable sector gives rise to wages both in the tradable and non-tradable sectors, which leads to the loss of external competitiveness in the non-tradable sector, decline in the range of domestically produced goods ($Z^H$), and substitution of the part of the non-tradables by the imported goods. Besides, the wage growth, bolstered by the productivity growth, will lead to an increase in demand and stimulate new quality imports, which in turn will result in the shrinking range of domestically produced goods and a price rise. As a result, the second factor prevails among the above-mentioned factors, and the export growth entails a decrease in the range of domestically produced goods and a price rise.

The import growth leads $Z^H$ to decline. It implies not only a loss of the comparative advantages in the non-tradable sector due to a price rise in the same sector, but also means the growth of imports of new quality goods, owing to increasing demand. That is to say, the decline of the range of domestically produced goods is determined by a widened range of imported goods rather than a substitution of the domestically produced goods by the imported ones.

There is another important circumstance: besides the impacts created by fundamental factors in the long run, the relative prices are also affected by short-term deviations caused by transfers. The model enables measuring the impact of transfers on the relative prices[5].

So, in addition to the key factors described in the model which are *per se* included in the export and import dynamics, the transfers can be taken as another variable that would describe short-term fluctuations:

$$\ln REER = -Z^H + \ln(TR), \quad (4)$$

*where:*

$\ln(TR)$ is transfers inflowing to Armenia, in logarithmic terms.

The route of transmission of impact of transfers is as follows: the country-transferee will spend a certain part of the transfer on non-tradable goods produced domestically, and such an excessive demand raises not only prices of non-tradables, but also wages. The latter causes dislocation of resources from the tradable sector and reduction in volumes of output in the tradable sector. As a result, a relative supply of tradable goods reduces in terms of foreign country exports, and, under such conditions, relative wages and relative prices in

[5] *The model includes the Keynesian approach of transfer impact on relative prices. See the detailed Keynes and Ohlene approaches in "Foundations of International Macroeconomics", Maurice Obstfeld and Kenneth Rogoff, 1996.*

Armenia rise. An increase in relative wages, with all else being equal, means a loss in foreign competitiveness. This leads a certain part of domestically produced tradable goods to become non-tradable goods and a certain part of non-tradable goods of foreign countries to become tradable, hence pushing $Z^H$ domestically produced range of goods to decline.

The forecast of the real effective exchange rate of the Armenian Dram for 2006 involved as follows: a behavioral equation was built and coefficients of the real effective exchange rate dependent on $Z^H$ and transfers were estimated through regression. Then, the equation (3) was used to calculate $Z^H$ for 2006, based on the CBA's forecast for quarterly indicators of imports and exports. The item "Precious stones and metals" was excluded from the calculations. The calculations made for 2006 show a reduction in the range of domestically produced goods in comparison with the previous year. Such a reduction, despite a dropping ratio of real exports/GDP (the growth of real GDP will outstrip the growth of real exports), will be determined by a rising ratio of real imports/GDP (real import will grow in both absolute value and as a share in GDP). Further, the quarterly estimations of $Z^H$ for 2006 were used in the regression analysis in order to forecast the level of real effective exchange rate for 2006. As for the transfers, the time series of inflowing private transfers and seasonal workforce income was used in the model, while 12.5% growth, as stipulated in the program, was used for the 2006 indicator. Below are the results of the regression analysis.

**Table 9.1**

| Dependent variable \ Independent variable | C intercept | Range of domestically produced goods ZH_SA(-1) | Transfers Log(TR_SA) | SEAS(3)** | Ratio of determination ($R^2$) |
|---|---|---|---|---|---|
| Armenian Dram's real effective exchange rate D(LOG(REER)) | 0.40<br>(0.69)* | -0.78<br>(-2.07) | 0.05<br>(3.24) | -0.05<br>(-4.71) | 0.60 |

** The figure in parenthesis is the value of T statistics.*
*** Seasonal dummy variable.*

Depending on expected developments in the external sector over 2006, the real effective exchange rate will appreciate by 7.5%.

# Brief Theoretical Description of the P-STAR Model Analysis of Inflation in Armenia[1]

P-STAR is a simplified model that describes the price dynamics. The model allows for the forecasting of short-term price fluctuations as a process with which the actual prices are brought in compliance with the equilibrium prices. The P-STAR model-yielded price gap (P*-P) can be treated as a benchmark indicator that allows for the predicting of future changes in prices, or otherwise, it reflects the inflationary potential of an economy. The P-STAR model of inflation is based on the quantity theory of money, whose basic identity is the following:

$$p + y = m + v \qquad (1),$$

where $p$ is the level of prices, $y$ is the real GDP, $m$ is the money supply, $v$ is the velocity of money (all variables are in logarithms).

According to the model, the long-term equilibrium price level (p*) is determined as follows:

$$p^* = m + v^* - y^* \qquad (2),$$

where $p^*$ is the long-term equilibrium price level, $v^*$ is the equilibrium level of the velocity of money, $y^*$ is the potential GDP.

The difference between the equations (1) and (2) produces the price gap (p*-p)

$$\mathbf{GAP = p^* - p = (y - y^*) + (v^* - v) \quad (3)}$$

The above expression denotes that the price gap represents a combination of two other gaps, as

(y-y*) - the capacity utilization gap or the GDP gap, and

(v*-v) - the velocity gap.

The followers of the P-STAR model believe that the main reason for the occurrence of inflation lies in the difference between the long-term equilibrium price level (p*) and the current price level. They insist that the excess supply of money, not yet reflected in the current prices, may cause the velocity of money to decline from the equilibrium price level and/or raise the GDP from its potential level. A situation like this will create inflationary pressures in the economy. So, the implication is that when the real GDP and the velocity of money are consistent with their equilibrium levels, the price level moves together with the money supply and inflation is a monetary phenomenon.

The P-STAR model may be turned into an equation for inflation, as follows:

[1] *The complete material is provided in the CBA's Q2 2002 report. The P-STAR model is practiced internationally – in some EU countries, Canada, Czech Republic.*

$$\pi_t = \alpha\ (p^*_{t-1} - p_{t-1}) + \pi_{t-1} \quad (4),$$ or, otherwise

$$\pi_t = \gamma_1\ (y_{t-1} - y^*_{t-1}) + \gamma_2 (v^*_{t-1} - v_{t-1}) + \pi_{t-1} \quad (5)$$

Below are the results of the regression analysis of the P-STAR model for Armenia. It should be noted that the equilibrium levels of the GDP (y*) and the velocity of money (v*) were calculated using the Hodrick-Prescott filter.

$$INF = \gamma_1 * YGAP_{t-1} + \gamma_2 * VGAP_{t-1} - \gamma_3 * INF_{t-1} - \gamma_4 * SEAS + C \quad (6)$$

**Table 10.1. Results of the regression analysis**

| Independent variable / Dependent variable | GDP gap indicator with one quarter lag ( $YGAP_{t-1}$ ) | Liquidity gap indicator with one quarter lag ($VGAP_{t-1}$) | Inflation indicator with one quarter lag ($INF_{t-1}$) | Dummy variable seasonal (seas – Q 3) | Dummy variable | Ratio of determination $R^2$ |
|---|---|---|---|---|---|---|
| Inflation (INF) | 0.149 (3.913) * | 0.142 (3.518) | -0.279 (-3.899) | -0.066 (-9.778) | 0.03 (9.438) | 0.90 |

** The figure in parenthesis is the value of T statistics.*

The equation (6) may be treated as a model that brings the Philips Curve and the monetarist model of inflation together. That is, equation (6) includes two competing aspects for shaping inflation. Philips is arguing that inflation is a result of disequilibrium in the goods market. The monetarist theory's argument is that inflation is a result of money market disequilibrium.

Below are the 12-month indicators of inflation by quarters, forecast through the P-STAR model for 2006. These indicators show that in the studied period, inflation will be within the target band.

**Table 10.2**

| 2006 | Q1 | Q2 | Q3 | Q4 or end-year inflation |
|---|---|---|---|---|
| Forecast inflation indicators | 1.7% | 3.7% | 3.8% | 3% |

# Inflation Forecast for 2006 through Equation Budget Deficit / Inflation

The estimation of the deficit / inflation correlation has relied on a circumstance that the monetary and fiscal policies in the long-run are decided upon the budget confinement. It shows as follows:

$$b^g_{t+1}/R_t = pd + b^g_t + \frac{(M_{t+1} - m_t)}{P_t},$$

*where:*

*$b^g_t$ is real value of Government's net financial assets for the t period,*
*pd is primary deficit,*
*R=1+r, where r is real interest rate,*
*$m_t$ is dram broad money,*
*$M_{t+1}$ is grand sum of dram broad money balance in the t period and the change of money supply through the CBA by the Government in the t+1 period.*
*The last term of the equation represents seigniorage.*

By treating the Government's budgetary confinement with certain mathematical modifications, an equation will be produced, as follows:

$$\pi = \frac{D - \mathrm{Int}}{\mathrm{m}} - \Delta rGDP \quad ,$$

*where:*

*$\pi$ is inflation,*
*m is dram broad money,*
*D is the change of money supply through the CBA by the Government, which is determined by adding official transfers to the budget deficit and subtracting interest payment and non-dram-denominated PIU funds from the budget deficit,*
*Int is volume on interventions by the CBA,*
*ΔrGDP is real GDP growth rate.*

***Table 11.1. Results of regression analysis of inflation and state budget correlation***

| Independent variable / Dependent variable | C intercept | Deficit less interventions, divided by dram broad money with a two-quarter lag | Real GDP growth rate | Real GDP growth rate with a one quarter lag | Inflation with a one quarter lag | Ratio of determination ($R^2$) | Durbin-Watson statistics |
|---|---|---|---|---|---|---|---|
| Inflation | 1.97 (2.5)* | 8.94 (1.96)* | -0.047 (-4.5) | -0.03 (-2.3) | -0.59 (-4.2) | 0.72 | 1.6 |

** The figure in parenthesis is the value of T statistics.*

***Table 11. 2. The 12-month inflation for 2006 forecasted through equation***

| | Q 4, 2005 | Q 1, 2006 | Q 2, 2006 | Q 3, 2006 | Q 4, 2006 |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| **12-month inflation** | 0 | -0.5 | -1.7 | 3.1 | 2.5 |

# CPI Econometric Analyses and Forecasts

For a forecast of the inflation indicator for 2006, the inflation model built yet in the previous year has been improved. In building the model, consumer basket goods were classified into individual groups of commodities, with specific approaches in respect to each of these groups. Classification was made by sectors, imports and domestic production and relied on the results of the comparative analysis of respectrive price changes. The consumer basket comprised groups of commodities as follows:

- Food product, *including:*
  - Meat and meat produce
  - Fruit
  - Vegetable
  - Milk and dairy produce
  - Alcoholic and non-alcoholic drinks
  - Eggs
  - Confectionery, oil and fat
  - Sugar
  - Tobacco
  - Fish
  - Coffee, tea and other
  - Breadstuff
- Non-food product, *including*
  - Petroleum, diesel oil and liquid gas
- Services

New variables describing the inflation behavior were included in the model, and the consumer basket underwent even more detailed grouping and special analysis. The model comprises not only the likely impacts of aggregate demand and aggregate supply on inflation, but also used econometric approaches to review their short- and long-term impacts on inflation. The forecast for the 2006 inflation indicator considered the structural change of the 2005 demand for money that had reflected an effect of currency substitution. During the year, depending on the developments in the macroeconomic environment and actual quarterly inflation indicators, a number of variables (monetary aggregates, interventions) directly and indirectly monitored by the CBA, may change within the framework of the model. This would allow to manage the inflation within the program.

The table below provides summary results of a regression analysis that describes the changes in price of each individual type of commodity, estimated within the framework of the inflation model. Particularly, the coefficients of exogenous variables impact on endogenous variables are presented. The CBA expert estimations were used for forecasting the

prices of some types of commodity. A relatively precarious price of the given commodity or the fact that the below provided exogenous variables do not materially affect the price of the commodity served a basis for these estimations. Particularly, this refers to the changes of prices of 'Services' and the item 'Fish' in the basket:

***Table 12.1***

| *Endogenous* / *Exogenous* | **LNFI** | **LFRUIT** | **LVEG** | **LMEAT** | **LMILK** | **LALKO** | **LCAN** | **LEGG** | **LSUG** | **LB** |
|---|---|---|---|---|---|---|---|---|---|---|
| **LNFI(-1)** | 0.436 | | | | | | | | | |
| **LNEER** | 0.142 | | | | | 0.119 | 0.227 | | | |
| **LNEER (-1)** | -0.068 | | | 0.197 | | 0.123 | -0.089 | | | |
| **LULC** | | | | | 0.588 | 0.369 | 0.320 | 1.988 | | |
| **LULC(-1)** | 0.030 | | | 0.373 | -0.588 | 0.164 | -0.226 | -1.507 | | |
| **RESM2(-1)** | 0.037 | | | 0.248 | | | | | | |
| **LGAGR** | | -0.285 | -0.207 | | | | | | | |
| **LFRUIT(-1)** | | 0.530 | | | | | | | | |
| **LRM2** | | | | | | | | | | |
| **LRM2(-1)** | | | | | | | 0.072 | | | |
| **LRM2(-2)** | | 0.503 | 0.537 | | | | -0.072 | | | |
| **Seas(1)** | | | | | | | | 0.080 | | |
| **Seas(2)** | | 0.496 | | | | | | | | |
| **Seas(3)** | | | | | | | | | | |
| **Seas(4)** | | 0.529 | 0.146 | | 0.046 | | | 0.186 | | |
| **LMEAT(-1)** | | | | 0.678 | | | | | | |
| **LMILK(-1)** | | | | | 0.771 | | | | | |
| **LALKO(-1)** | | | | | | 0.333 | | | | |
| **LCAN(-1)** | | | | | | | 0.750 | | | |
| **LEGG(-1)** | | | | | | | | 0.20 | | |
| **LSUG(-1)** | | | | | | | | | 0.272 | |
| **LEXCH** | | | | | | | | | 0.302 | 0.297 |
| **LEXCH(-1)** | | | | | | | | | -0.197 | |
| **LBI** | | | | | | | | | | 0.300 |
| **LBI(-1)** | | | | | | | | | | 0.159 |

*LNFI – prices of non-foodstuff, expressed in logarithms,*
*LFRUIT – prices of fruit, expressed in logarithms,*
*LVEG – prices of vegetable, expressed in logarithms,*
*LMEAT – prices of meat and meat produce, expressed in logarithms,*
*LMILK – prices of milk and dairy produce, expressed in logarithms,*
*LALKO – prices of alcoholic and non-alcoholic drinks, expressed in logarithms,*
*LCAN – prices of confectionery, oil and fat, expressed in logarithms,*
*LEGG – prices of eggs, expressed in logarithms,*
*LSUG – prices of sugar, expressed in logarithms,*
*LB – prices of petroleum, expressed in logarithms,*
*LNEER – nominal effective exchange rate, expressed in logarithms,*

*LULC – unit costs of workforce, expressed in logarithms,*
*LBI – international price of petroleum, expressed in logarithms,*
*LGAGR – volume of production of agricultural products, expressed in logarithms,*
*LEXCH – USD / AMD exchange rate,*
*LRM2 – dram broad money, expressed in logarithms,*
*LRESM2 – variable describing disequilibrium in money market,*
*Seas (1,2,3,4) – seasonal dummy variable.*

The following scenario of macroeconomic indicators and exogenous variables of the model for 2006 has been adopted:

| Date | Real dram broad money growth rate (%) | Real GDP growth rate (%) | Exchange rate | Workforce unit costs growth rate (%) | Agricultural product growth rate (%) | Average monthly wage growth rate (%) |
|---|---|---|---|---|---|---|
| **2006** | | | | | | |
| Q1-06 | 26 | 10 | 439 | 9.1 | 9.00 | 20.00 |
| Q2-06 | 19 | 10 | 433 | 9.1 | 9.00 | 20.00 |
| Q3-06 | 19 | 10 | 422 | 9.1 | 9.00 | 20.00 |
| Q4-06 | 19 | 10 | 421 | 9.1 | 9.00 | 20.00 |

Under this scenario, the following forecast will be achieved for prices.

In order to get a more complete picture of inflation trends, indicators of the table are shown in a 12-month growth span, which allows the avoidance of seasonal price fluctuations. However, there is some seasonality in the annual inflation indicator, particularly determined by the vegetation period developments.

| Date | Food price growth rate in CPI | Non-food price growth rate in CPI | Service price growth rate in CPI | CPI growth rate |
|---|---|---|---|---|
| **2006** | | | | |
| Q1-06 | 0.32 | 1.34 | 2.06 | 0.79 |
| Q2-06 | 5.54 | 2.22 | 1.86 | 4.38 |
| Q3-06 | 4.12 | -0.24 | 1.01 | 2.83 |
| Q4-06 | 3.8 | -0.07 | 1.01 | ***2.71*** |

# STATISTICAL METHODS FOR INFLATION TRENDS FORECAST FOR 2006

There are many works about analyses and forecasts for the inflation time series. Some papers suggest using aggregated leading or concurrent indicators for forecasting inflation. The essence of this method is that combined aggregated indicators are created based on numerous time series in order to predict the inflation dynamics. Inflation can be forecast also through a multiple regression analysis, considering it as a function of other macroeconomic indicators. These methods is advisable to apply for forecasting the annual inflation.

What we suggest is a forecast based on the analysis of the price time series and relying on the trends of the past 5 years. The splitting of the monthly series of inflation by trend, seasonality and random element underlies the analysis. In terms of Armenia, the seasonality accounts for more than 80-85% of volatility of inflation. What therefore is important is to forecast the performance of inflation over the year (inflation by months, by quarters), relying on the annual inflation indicator forecasted through a factor analysis. The levels of the monthly inflation forecasted by this method may serve a basis for making adjustments to the monetary policy, where the actual levels of the monthly inflation deviate from the forecast. We are proposing to apply this method in two statistical ways, which are provided below, as follows:

***1. Holt-Winters method application sequence:*** This method is mainly used for a short-term forecast of time series. The method allows evaluating the most likely pattern of a change in a particular time series. On the other hand however, it does not enable to model the behavior of error volatility. The sequence of forecast of the Holt-Winters method is as follows:

1. The monthly inflation time series by dint of a seasonal smoothing method X12 ARIMA has been split into components (trend (12%), seasonality (85%), random element (2%)).
2. The seasonality component in the dynamics of time series is more stable. As for the trend and random element, these are volatile components, so the trends of change in these two components will be needed to evaluate in order to forecast the trends of change in the time series. The random element has been taken as 1, considering the trends in previous years and its low share in the total dispersion. To forecast the trend component, the Holt-Winters method has been used whereby coefficients *a* and *b*, ranging within the intervals 0 – 1, were defined for the average of time series and for the trend, in order to smoothen and

3. Of these 400 variants, 90% probable variants have been reviewed, cutting an appropriate number of indicators from the upper and lower series. The maximum and minimum values of inflation have been calculated for each variant.
4. For each probable variant, the time series has been restructured, adding the seasonality and random element components.

***2. ARMA & Bootstrap methods application sequence:*** The essence of this method is that the trends of change in time series are being modeled based on statistical experiments. As opposed to the first, this method allows modeling the behavior of error volatility. The sequence of forecasting ARMA and Bootstrap methods is as follows:

1. The monthly inflation time series by dint of a seasonal smoothing method X12 ARIMA has been split into components (trend, seasonality, and random element).
2. The random element has been evaluated using the above-noted principle.
3. Identifying ARMA model for the trend component.
4. Evaluating selected ARMA (1, 0) model parameters.
5. Measuring the differences between the actual inflation and the ARMA model-evaluated series.
6. Creating artificial generation of errors (differences) of the ARMA model by dint of the Bootstrap method (we have completed 150 independent experiments).
7. Generating new time series of inflation based on the errors produced by this method (150 scenarios).
8. Forecasting generated time series of inflation.
9. Of these 150 variants, 90% probable variants have been reviewed, cutting an appropriate number of indicators from the series. The maximum and minimum values of inflation have been calculated for each variant.
10. Restructuring of the series, adding the seasonality and random element components.

These two statistical methods have been used to determine the most probable intervals of change in the Armenia's inflation for 2006 (Charts 1 and 2).

The most probable intervals of inflation for 2006 range:

- 1.8% - 4.9%, according to Holt-Winters, with the most probable level of 3.4%; and
- 1.8% - 3.7% according to ARMA and Bootstrap methods, respectively, with the most probable level of 2.8%.

*Chart 1*

**The most probable intervals of trends of change in inflation over 2006, by Holt-Winters method (against December, 2005)**

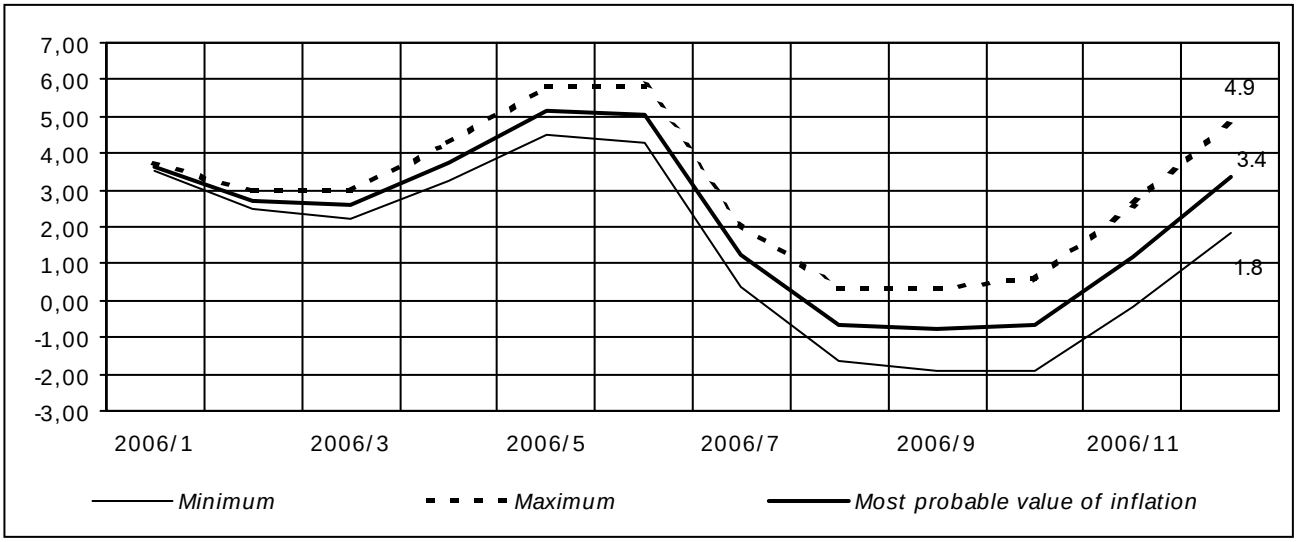



*Chart 2*

**The most probable intervals of trends of change in inflation over 2006, by ARMA and Bootstrap methods (against December, 2005)**