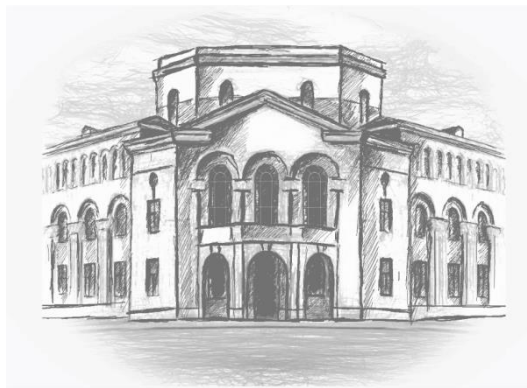# ARMENIA PUBLIC DEBT SUSTAINABILITY ANALYSIS

Macroeconomic Policy Department

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Introduction

The global financial-economic crisis highlighted the dept stability probem in a new way. While in the past this problem concerned mainly poor and low-income countries, currently it is faced by developed countries such as Greece, Portugal, Spain and even Italy and Ireland, which were considered to be stabile in the recent past.

The crisis has had heavy consequences on the economy of Armenia as well. One of these consequences was the drastic increase of the external debt, which highlighted the need for the assessment of the debt sustainability of Armenia. The next phase of fast debt accumulation was between 2014-2016, when the decrease of commodity prices and the sanctions against the main economic partner of RA – Russian Federation, resulted in crisis developments in the latter's economy, which found its reflection in the economy of RA as well. The issue deepened with the appreciation of USD in the international currency markets, and the Armenian Dram depreciated as well at the end of 2014, inflating the external debt of the RA. It was necessary to respond to the external shocks by a stimulating fiscal policy, and the public debt bore the burden of it.

Today, many are concerned whether Armenia is solvent, stabile from the debt perspective, and for how long we can still use the external financing for solving the current issues. This analysis aims at answering the above questions.

As is known, debt sustainability is the total of the solvency, liquidity and the absence of implementation of unrealistic big adjustments, or the capacity of the country to fulfill fully its current and future debt liabilities without restructuring, violation of terms and endangering the growth.

The trends of the RA public debt before and after the crisis are presented in the first part of the analysis, followed by the theoretical and methodological frameworks of the public debt sustainability assessment model developed jointly by the International Monetary Fund and the World Bank, and the macroeconomic assumptions put in the foundation of the model and their risks. These are followed by the interpretation of the outputs of the model. The last part of the docment presents the summary of the debt sustainability assessments and the main conclusions.

1. Trends of the RA public debt before and after the crisis

The public debt of RA was gradually increasing before the global financial-economic crisis. Between the years 2000-2008 it has increased from 912.4 mln. USD to 1.906 bln. USD, due to the primary fiscal deficit. However, the public debt/GDP ratio has decreased continuously (Figure 1), reaching 16.4 percent in 2008, compared with the 48.9 percent in 2000, which was due to the high rates of economic growth.

The debt drastically increased in 2009 – by 1.47 bln. USD, reaching 3.38 bln. USD, and the debt/GDP ration increased by 24 percent points, reaching 40.6 percent.

Figure 1: The RA public debt and the government debt in 2000-2016
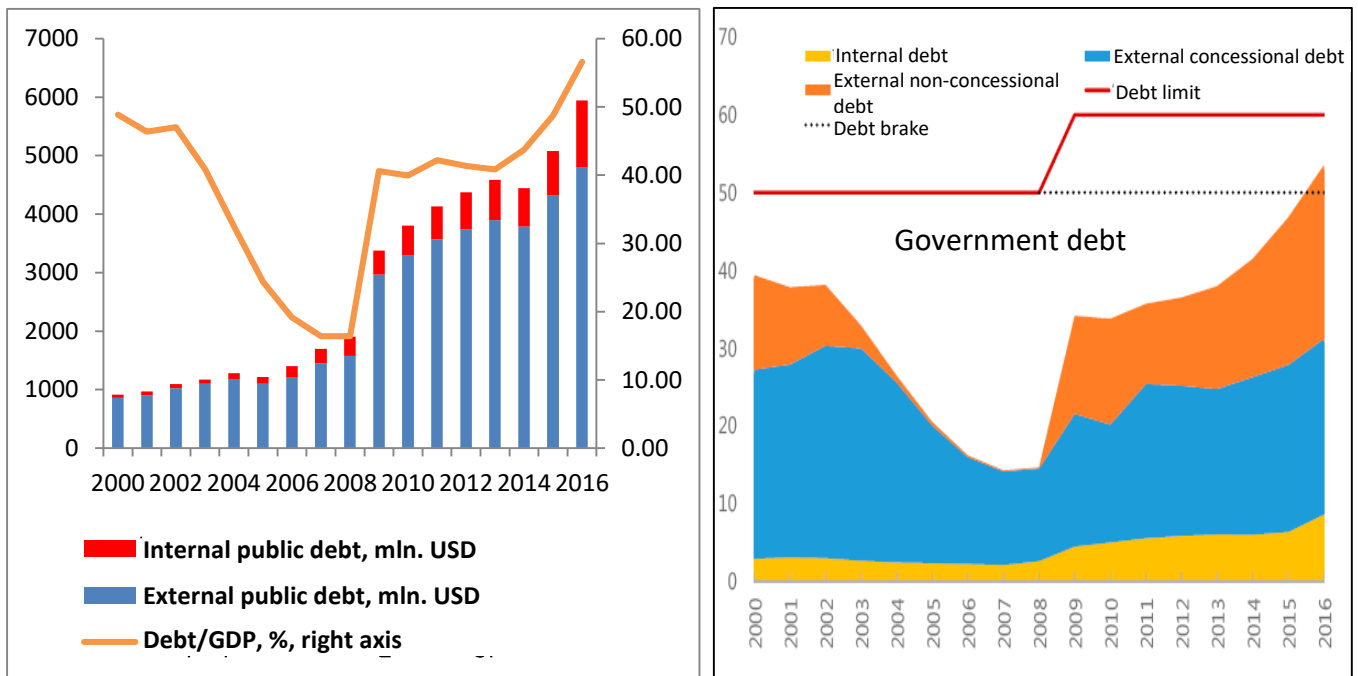
Source: RA MoF and NSS

The drastic increase of the debt in 2009 was mainly conditioned by the increase of the international reserves and the fiscal deficit for the objective of protecting the real economy, as well as by the depreciation of the Armenian Dram. At the time, the government had to make non-concessional borrowings as well, a part of which was directed to the private sector through net lending operations. In 2010, the main factor conditioning the debt was the primary deficit, as in the pre-crisis years. Here it is necessary to look at the reasons behind the current problems of the debt mentioned in the Introduction section. So, despite the fact that the share of the debt in the GDP has decreased since 2000 due to the high rate of economic growth and the appreciation of the Armenian Dram, the nominal debt has increased due to the permanent primary deficits (an average of 0.7 percent in 2000-2008). During 2010-2013 the

public debt was increasing for 8 percent in average, and the debt/GDP ratio in that period increased for just 0.9 percent points, which was mostly due to the post-crisis recovery growth. In 2014, in the conditions of the depreciation of the Armenian Dram, the debt/GDP ratio increased for 2.8 percent points.

In 2015 and 2016 the public debt in USD terms increased for 15.7 percent in average (33.8 percent in 2 years), and the debt-GDP ratio increased by 12.9 percent. The increase of the debt in this period was dictated by the stimulating fiscal policy, in particular – the expenditure policy, because an objective was set to counteract the slowdown of the economic growth rates due to the impact of the shocks coming from the external world, and to ensure macroeconomic stability. As a result, in 2016 the public debt of the RA was 5942 bln. USD, the debt/GDP ratio - 56.6 percent. The RA government debt/GDP was 51.8%, thus exceeding the limit of 50% set by the law.

Based on the problem of ensuring the debt sustainability, the RA government plans to decrease the fiscal deficit gradually during 2018-2020, due to which the Government debt/GDP ratio will increase in 2018, and then will gradually decrease below the level programmed for 2017[1].

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[1] Please see the state MTEF for 2018-2020.

2. Theoretical and methodological foundations of the public debt sustainability analysis model

2.1. General methodological provisions

The debt sustainability assessment is based on two main principles: the solvency and liquidity.

The solvency is the situation, where the debt accumulated by the state is fully covered by the net present value of the primary surpluses expected in the future.

The liquidity is the capacity of the state to fulfil its liablities that have become due.

The debt vulnerability is the risk of losing the solvency and liquidity.

The probability of non-repayment of the debt is mainly explained by three factors:

- Debt burden

- Quality of policies and institutions

- Sensitivity to shocks.

The debt sustainability analysis[2] helps in understanding the possible development of the unredeemed stocks of liabilities over time.

The main pillars of the debt sustainability model are as follows:

1. Standard analysis of the debt and debt service dynamics oriented towards the future

- The standardization allows making comparisons between the countries

- The specificities of the low-income countries are considered: a long time horizon (20 years) is analysed in order to reflect the long concessional term and maturity

- The present value is analysed instead of the nominal value, in order to reflect the concessionality

- The analysis is comprised of projections based on the baseline scenario (the most probable outcome),

- A standardized stress test is implemented based on the vulnerability of the country towards the shocks, which has been manifested in the past.

- Country-specific stress tests are implemented, if the vulnerabilities are not appropriately reflected in the standard tests.

2. External debt sustainability assessment, in relation to the indicative country-specific debt burden thresholds that depend on the quality of the policies and the institutional quality.

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[2] This section is based on the following analyses: Allen M. Debt Sustainability Analysis for Market Access countries. IMF: Staff guidance note. 2008; Kanuto O. and Moghadam R. Debt Sustainability Analysis for Market Access countries. IMF, IDA: Staff guidance note for low income countries. 2010; Budina, N. and S. van Wijnbergen, 2007, "Quantitative Approaches to Fiscal Sustainability: A New World Bank Tool Applied to Turkey", World Bank Policy Working Paper 4169; Bandiera, L., Budina, N., M. Klijn and S. van Wijnbergen, 2007, "The "How to" of Fiscal Sustainability: A Technical Manual for Using the Fiscal Sustainability Tool", World Bank Policy Working Paper 4170.

In order to assess the debt burden, the debt is compared with the capacity for repayment. The indicators of the size of the debt are: debt servicing and stock; the idicators of the capacity for repayment are: the GDP, exports and state revenues (excluding grants).

The indicative debt burden thresholds depend on the CPIA[3] index assigned to the country by the World Bank, which assesses the current policy and institutional framework of the country:

➢ It is calculated annualy for all countries

➢ It is used by the Bank in the context of the framework of allocations process and debt sustainability

➢ It consists of 16 criteria grouped in 4 clusters:

  ▪ Macroeconomic management

  ▪ Structural policies

  ▪ Policies for social inclusion and equity

  ▪ Public sector management and institutions

➢ The countries are rated for each criterion (from 1 to 6)

➢ The total score is the simple average of the ratings of all the criteria.

The table below presents the indicative thresholds according to CPIA.

Table 1: The external public debt indicators and their thresholds according to CPIA

	Quality of policies and institutions		
	Weak CPIA<3.25	Medium 3.25<CPIA<3.75	Strong CPIA>3.75
Net Present Value (NPV) of debt /GDP	30	40	50
NPV of debt/export	100	150	200
NPV of debt/revenues	200	250	300
Debt service/export	15	20	25
Debt service/revenues	18	20	22

Table 2: Public debt indicators and their thresholds according to CPIA

Quality of policies and institutions (CPIA)	NPV of debt / GDP (%)
Weak (CPIA<3.25)	38
Medium (3.25<CPIA<3.75)	56
Strong (CPIA>3.75)	74

3. Classification of the non-repayment risk for external debt, which takes into account the assessment of the threshold, as well as other country-specific factors.

[3] Country policy and Institutional Assessment

By the way, the classification shall not be done mechanically. **In frames of the Debt sustainability analysis, Armenia received the strong CPIA rating from the WB.**

The DSA for low-income countries is important for the general assessment of the macroeconomic sustainability, fiscal policy, long-term sustainability and debt sustainability by the IMF, as well as for the determination of the grants' element and the limits of the non-concessional borrowings required for the country.

The DSA framework takes into account both the external and the internal debt, regardless of the size of the latter.

The debt sustainability analysis model consists of two parts: the analysis of the external and public (external + fiscal) debt.

2.2. The external sustainability model

The external sustainability model analyses the external borrowings made by the residents (of both public and private sector); moreover, all variables are expressed in USD.

The external debt is formed according to the following equation:

$$D_{t+1} = \left(1 + r_f\right)DF_t + \left[(1 + r_d)(1 + \varepsilon)DD_t\right] - TB_{t+1}$$

with TB denoting the non-interest current account balance. The change in the exchange rate ε is now defined in terms of U.S. dollars per local currency, with ε > 0 representing an appreciation of the domestic currency. All other variables are defined as before.

Expressing this equation as a proportion of GDP, the external debt evolution can be expanded as:

$$d_{t+1} - d_t = \frac{1}{1+g+\rho+g\rho}\left(\hat{r} - g - \rho(1 + g) + \varepsilon\alpha(1 + \hat{r})\right)d_t - tb_{t+1} \quad ,$$

Where α (now) represent the share of domestic currency-denominated debt in total external debt, ε is the change in the exchange rate, *tb* is the non-interest current account balance expressed as a percent of GDP and ρ is the change in the GDP deflator $(1 + \rho) = (1 + \pi)(1 + \varepsilon)$. All other variables are defined as in the public sector debt analysis (please see in the next part).

The external debt model also separates the different channels affecting the debt growth: the non-interest current account deficit and the automatic factors (real interest rate, real GDP growth and changes in exchange rate). The contribution of the real interest rate to the growth of the debt ratio is defined in the model as $\frac{\hat{r}}{1+g+\rho+g\rho}dt$, the contribution of the real growth rate as $-\frac{g}{1+g+\rho+g\rho}dt$ and the contribution of the changes in price and exchange rate as $\frac{-\rho(1+g)+\varepsilon\alpha(1+\hat{r})}{1+g+\rho+g\rho}dt$.

The external debt analysis model consists of a baseline and two alternative scenarios and six stress tests.

Baseline scenario

The components of the **Baseline scenario** are the macroeconomic projections and the PPG external debt stock and flows. The macroeconomic projections and the change of PPG external debt are linked through the balance of payments, which is reflected by the following formula:

Debt (t) = Debt (t-1) – Revenues from foreign currency exchange (t-1) + Losses from foreign currency exchange (t-1) + Other factors (t-1), where:

The revenues from foreign currency exchange are:

- Exports of goods and services,
- Revenue received from abroad (including interest revenue),
- Transfers from abroad (foreign aid, remittances, etc.)
- Foreign direct investments

The losses from foreign currency exchange are:

- Imports of goods and services,
- Revenue paid abroad (including the interest paid),
- Transfers abroad (foreign aid, etc...)
- Foreign direct investments

Other factors are:

- Exclusive financing,
- Debt relief (HIPC, MDRI)
- Non-debt creating flows other than FDI (e.g. capital transfers)
- Assessment impacts
- Change in Forex reserves.

The above mentioned formula can be presented also in the following way:

Debt (t) = Debt (t-1) + (Import (t-1) – Export (t-1)) – Net external revenue (t-1) – Net transfers (t-1) – Net FDI (t-1) + Other factors (t-1),

or:

Debt (t) = Debt (t-1) + Current account (t-1) – Net FDI (t-1) + Other factors (t-1),

or:

$$D(t) = D(t-1) + C(t-1) + r\, D(t-1) - FDI(t-1) + Z(t-1)$$

$D(t) - D(t-1) = C(t-1) + r\, D(t-1) - FDI(t-1) + Z(t-1)$, where

C – the current account balance, excluding interest payments

r – the nominal interest rate of the nominal external debt

FDI – the Foreign direct investments

Z – Other factors.

The Nominal debt/GDP ratio in the external debt model is calculated by the following formula:

$$D(t) = C(t) - NFDI(t) + (1+r(t-1)) D(t-1) + Z(t)$$

The strength of the baseline scenario is tested through alternative scenarios and mandatory tests, as well as the comparison of the standarized shocks with country-specific shocks.

The alternative scenarios are: the historical scenario (A1) (the key variables with their historical average) and the financing scenario (A2) (the interest rate for new borrowings is higher for 200 basis points).

The mandatory tests are: during the first two projected years, the shocks of 1 STD deviation from historical average parameter for the real GDP (B1), exports (B2), GDP deflator (B3), Net FDI and transfers (B4), ½ STD deviation from historical average for the combination of B1 and B4 tests, as well as one-time 20% nominal depreciation of exchange rate.

The interpretation of the results of the external debt analysis:

- **Low risk:** All debt indicators are lower than the corresponding thresholds for country-specific debt burden. The implementation of stress tests and the country-specific alternative scenarios does not result in indicators that significantly violate the thresholds. In cases where only one indicator is higher than its benchmark, it is necessary to determime, whether it is a problem of debt sustainability or another issue - for example, a data problem.

- **Moderate risk:** Despite the baseline scenario not indicating any violation of thresholds, the alternative scenarios or the stress tests indicate a significant increase in debt service indicators (approaching the thresholds) or a violation of the debt or debt service thresholds in the projected period.

- **High risk:** the baseline scenario indicates a long-lasting violation of the debt or debt service thresholds, but at present the country has not faced any payment difficulties. This deepens through the alternative scenarios and stress tests.

- **Risk of non-repayment of the debt**: The current ratios of the debt and debt service significantly or continuosly violate the thresholds. In general, the presence of arrears is a sign of the country's difficulties with debt repayment, unless there are reasons for the failure to service the debt other than the debt service burden.

2.3. Public debt model

The public sector model analyses the behavior of the debt/GDP ratio with all variables expressed in local currency. It is necessary to consider several issues when formulating the baseline projection, including the definition of the debt, the involvement of the public sector and the approach towards contingent liabilities. In formulating the baseline projection, several issues need to be considered, including the definition of debt, the coverage of the public sector, and the treatment of contingent liabilities. In general, it is recommended that the definition of debt be based on gross liabilities, and that the coverage of public debt be as broad as possible, including, where possible, public enterprises and self-governance bodies.

The underlying equation for the evolution of the public debt is as follows:

$$D_{t+1} = \left[(1 + \varepsilon)(1 + r_f)DF_t\right] + (1 + r_d)DD_t - PB_{t+1},$$

Where:

D_{t+1} is the total size of the debt in *t+1* period,

PB is the primary balance.

The size of the debt consists of both internal debt, as well as the foreign-currency debt. The domestic-currency debts (DD_t) evolves according to the interest rate in the market (r_d), while the evolution of the foreign-currency debt, expressed in domestic currency, is affected not just by the foreign interest rate (r_f) but also by changes in the exchange rate ($\varepsilon = \dfrac{e_{t+1} - e_t}{e_t}$, with *e* defined as units of local currency per U.S. Dollar). A depreciation of the local currency ($\varepsilon > 0$) leads to an increase in foreign currency debt, expressed in local currency terms.

Expressing this equation as a proportion of GDP, the public debt ratio can be expanded as follows:

$$d_{t+1} - d_t = \frac{1}{1+g+\pi+g\pi}\left(\hat{r} - \pi(1 + g) - g + \varepsilon\alpha(1 + \hat{r})\right)d_t - pb_{t+1},$$

Where:

d is the Debt/GDP ratio,

pb is the primary balance,

$\hat{r}$ is a weighted average of domestic and foreign interest rates,

α represents the share of total public sector debt that is incurred in foreign currency,

π represents the change in the domestic GDP deflator

g is the real GDP growth rate.

Based on the above equation, the public sector model identifies different channels that contribute to the evolution of the Debt/GDP ratio: the primary deficit and the endogenous/automatic factors, which include the real interest rate, real GDP growth, and exchange rate movements.

The contribution of the real interest rate to the evolution of the debt ratio is defined in the model as $\frac{\hat{r}-\pi(1+g)}{1+g+\pi+g\pi}dt$, the contribution of the real growth rate as $-\frac{g}{1+g+\pi+g\pi}dt$, and that of the exchange rate depreciation as $\frac{\varepsilon\alpha(1+\hat{r})}{1+g+\pi+g\pi}dt$. The separation of the different factors allows an assessment of their relative importance for the evolution of the debt ratio. It also serves as the basis for alternative scenarios (permanent shocks) or stress tests (temporary shocks). Results of these tests are summarized together with the baseline projections in a separate figure, with the numerical values also presented in the model.

The model also includes debt-creating or debt-reducing flows, e.g., from recognition of contingent liabilities or privatization receipts. Changes in gross debt arising from below-the-line operations, such as repayment of debt financed by a reduction in financial assets, and cross-currency exchange rate movements are included as a residual. It is critical to monitor the behavior of this residual, as it may highlight errors in implementing this approach. A large residual may, in particular, signal a breach of the flow-stock identity linking the deficit to changes in debt. The residual should be small unless it can be explained by specific factors.

The public sector DSA consists of a baseline, three alternative scenarios and five stress tests.

Baseline scenario

The baseline scenario is based on the limited budget of the government, meaning that in the long-term perspective, the revenues shall correspond to the expenditures. The analysis also tries to make a more complete approach towards debt sustainability, by reflecting different scenarios.

The government accumulates debt, when the expenditures exceed the revenues, i.e. the consumption exceeds the revenues:

Debt accumulation = Expenditures – Revenues,

or

Debt (t+1) – debt (t) = Expenditures – Revenues – Other factors

The revenues are (budget financing sources):

- Taxes
- Non-tax revenues (including interest revenue)
- Transfers from abroad (external aid, etc.)

The expenditures are (utilization of the financing):

- Non-interest expenditures (salaries, etc.)

- Interest expenditures (liabilities for the previous debt stock)

- Investments

- Transfers (subsidies)

  Other factors affecting the limited budget are:

- Exclusive financing,

- Debt relief (HIPC, MDRI)

- Contingent liabilities

- Evaluation of assets

- Privatization receipts

Thus,

Debt (t+1) – debt (t) = Primary balance + Interest – Other factors

Alternative fiscal scenarios

The alternative fiscal scenarios are: A1 – real GDP growth and primary balance with historical average, A2 – the primary balance is constant since the last year of the history (no-reforms scenario), A3 – Permanent lower growth of GDP.

Mandatory tests

The mandatory tests are: during the first two projected years, the shocks of 1 STD deviation below the historical average parameter for the real GDP (B1) and primary balance (B2), using ½ STD deviation below the historical average for the combination of B1 and B2 tests (B3), a one-time 20% real depreciation of exchange rate, as well as a 10% reduction of GDP against other debt-creating flows (B5).

In order to interpret the public debt analysis results correctly, it is necessary to consider the evolution of the debt burden indicators over time, taking into account that the indicative thresholds are for the external debt only, to maintain balance between the mechanical and judgemental or qualitative assessments, to identify the vulnerabilities (are certain debt burden indicators more vulnerable to shocks?) and the consequences for policy (the necessity for financing more concessional debt, increase of revenues, strengthening the tax administration, improving the debt management).

Concluding the summary description of the model, it can be stated that the good quality of the DSA depends on the quality of the underlying baseline scenario; it is important not to assess automatically the risk of non-repayment of debt and to discuss clearly the logic of the classification and the main sources of

uncertainty. The debt sustainability framework is not the single answer to the question of the debt risk of low-income countries, however it is the only detailed and standardized popular analysis.

3. Sustainability analysis for RA Government debt

It is necessary to consider the situation with the debt of Armenia from the sustainability and solvency perspective. Armenia is solvent, when the net present value (NPV) of the revenue flow is at least equal to the amount of NPV of expenditures and any initial debt, i.e. the country meets its intertemporal budget constraint. For the government, this implies that the NPV of future primary balances must be equal to or greater than the NPV of the public debt stock, or simply equal to or greater than the public debt stock, if the latter has been issued at rates close to the market ones).

3.1. Main macroeconomic assumptions (years 2017-2037)

The macroeconomic assumptions included in the model are based on the indicators of the long-term financial program being prepared by the Macroeconomic department of the RA Ministry of Finance.

At the beginning of the projection period (2017-2037), in parallel with the positive developments of the global economy, which manifest especially through the multiplying impact of the growth of exports and transfers, the **real GDP** growth will be conditioned, in the first place, by the diversification of the economy, the industrial development and the deepening of the export orientation of the economy. As a result, at the end of the projection period, we will have a growth of the specific weights of industry and services in the GDP, with a decrease in agriculture and construction. An average 5.1% growth of GDP is assumed in the projection period (2017-2037).

The structure of the **investments** will reflect the trend for the development of the sectoral structure of the GDP, stimulating the production-purpose construction.

During the projection period, an **inflation** of 2.4 percent is assumed for 2017, and a stabile level of around 4 percent for the future years, which is conditioned by the inflation targeting policy being implemented by the CBA.

It is projected that the exports[4] will have a fast growth against the imports, mostly bearing the impact of the internal economic developments and structural shifts, as well as of the process of integration of the Armenian economy with the international economy; it is projected that the exports will grow for an average of 8.4% per year.

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[4] Exports of goods and services

According to projections, the **current account** deficit/GDP ratio will have a mostly stabile behaviour. In absolute values, the current account deficit will be 1.2 bln. USD in average during the projection period.

In the projection period, the **remittances[5]** grow for 6.9% in average, reaching 2.8 bln. USD at the end of the period**.**

It is assumed that the **public revenues/GDP** ratio will increase from the 23.1% level of 2016 to around 25.4% of GDP at the end of the considered period. The main objectives of the fiscal sector programming were the taxes/GDP indicator, stabilization of the fiscal deficit, targeting of the capital expenditures/GDP indicator.

The long-term programming of the fiscal deficit is based on the maintenance of the stabile level of the deficit within 2.1 percent of GDP in average, and 1.9 percent of GDP at the end of the period.

According to the projection, the **net FDIs** will grow for 16.25% in average, reaching 1,69 bln. USD at the end of the period.

The **exchange rate** has been assumed as stabile, which is conditioned by the absence of tools for the long-term projection of the rate.

Risks of macroeconomic assumptions. The macroeconomic assumptions contain certain risks, with two main ones. First, the exchange rate remains unchanged from 2018, which implies an automatic reduction of the debt burden. As mentioned above, this circumstance is conditioned by the current absence in economics of reliable models for long-term projection of the exchange rate. The other main risk is the relatively high growth of exports, accompanied by unchanged exchange rate, which, in its turn, shall imply an increase in the quality of our goods and services in order to maintain competitiveness.
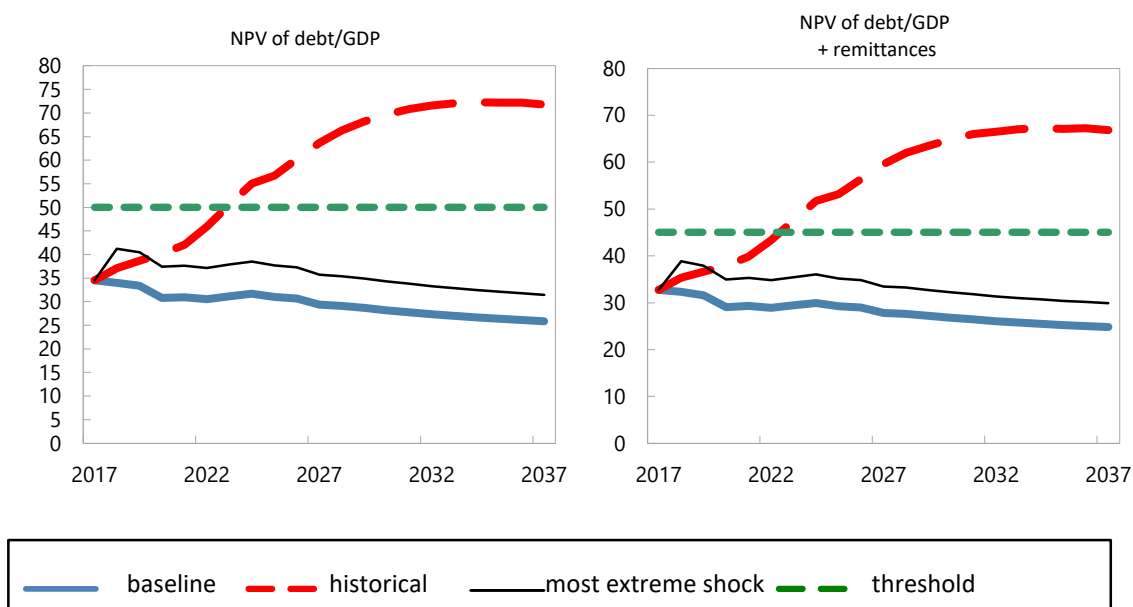
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[5] Here, under the remittances we mean the amount of private transfers and transfers from seasonal workers

3.2. Sustainability analysis for the external debt of the RA Government

Armenia's DSA presented the following results:

Figure 2: NPV of debt/GDP and NPV of debt/GDP+remittances[6]

As seen in Figure 2, the NPV of debt/GDP ratio remains below the threshold in the projected period in case of baseline and "most extreme shock" scenarios, the latter being the one-time 20% depreciation of the exchange rate in the first year of projection. In case of the first scenario, the indicator shows a reduction trend during the whole projected period, while in the case of the second scenario, it increases initialy and decreases after, in parallel with the trends registered in the baseline scenario case. At the end of the projection horizon, the NPV of external debt/GDP ratio reaches 25.8 percent in the baseline scenario and 31.5 percent in the "most extreme shock" scenario.

NPV of debt/GDP ratio crosses the threshold in the historical scenario, where the GDP growth rate, the GDP deflator, the current account (excluding interest payments) and net FDI flows are defined using their historical average values. In this case, the NPV of debt/GDP ratio reaches 72.2 percent at the end of the projection horizon.

The risks are the same for the NPV of debt/GDP+remittances indicator. In this case, the circumstance of approaching a lower threshold in almost the same period shows that a reduction in remittances will exacerbate the debt issues.

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[6] For the countries that have large remittances from abroad, it is common to calculate the debt indicators by including the remittances as well, but the threshold is decreased in this case.

The behavior of the NPV of external debt/exports and the NPV of external debt/revenues ratios in case of stress scenarios is similar to the behavior of the previous indicators, with one exception: the NPV of debt/revenues ratio does not exceed the threshold.

Figure 3: NPV of debt/exports and NPV of debt/budget revenues
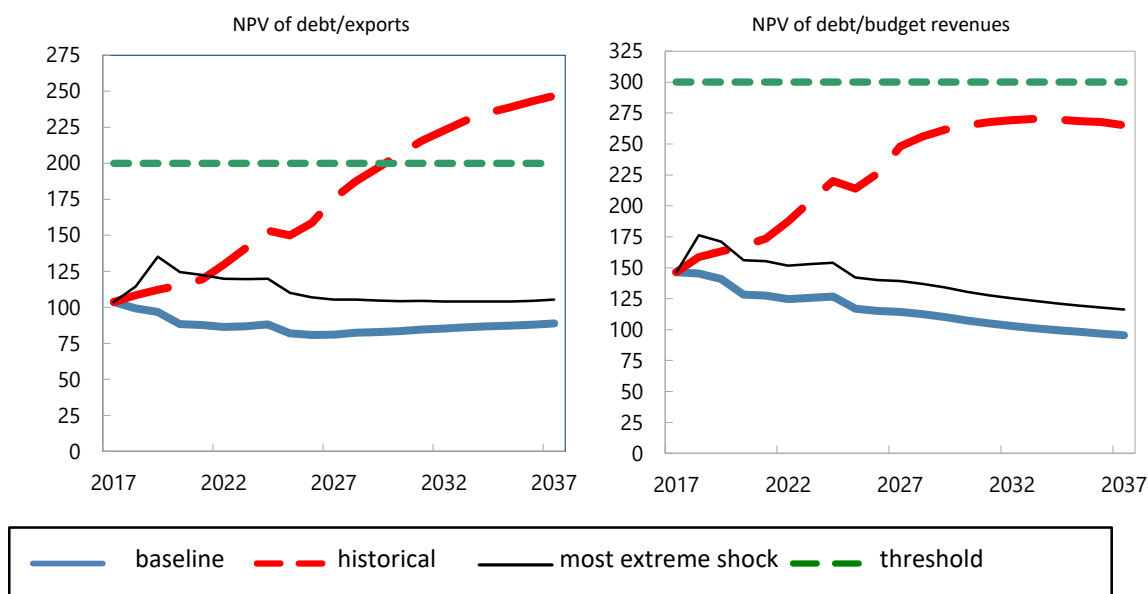
The NPV of debt/exports ratio remains significantly lower than the threshold in the projectionhorizon under the baseline and "most extreme schock" scenarios, while under the historical scenario it reaches 246.9% at the end of the period. Here the "most extreme shock" scenario is the lower rate of exports growth (historical growth rate minus 1 unit of standard deviation).
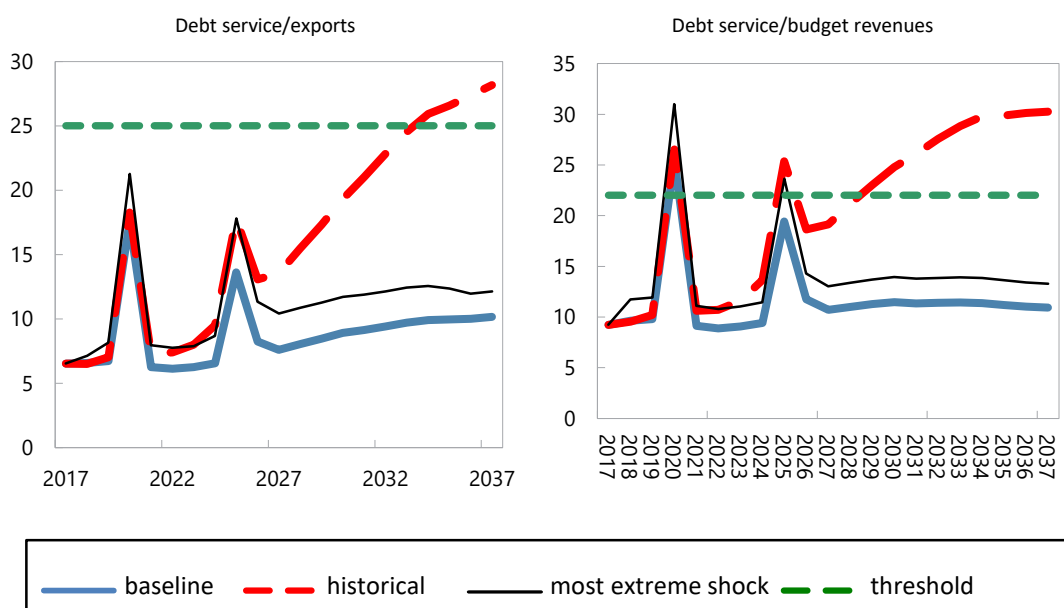
In the projection horizon, the NPV of debt/budget revenues ratio decreases in the baseline scenario, while in the "most extreme schock" scenario it increases at the beginning and decreases after, in parallel with the trends of the baseline scenario. In historical scenario, it increases in the first half of the projection period and approaches the threshold, after which it stabilises and starts decreasing, reaching 267.8% at the end of the period. Here, the "most extreme shock" scenario is the one-time 20% depreciation of the exchange rate.

The debt service/exports and debt service/budget revenues ratios have a fluctuating dynamics in the projection horizon under all stress scenarios. It has 2 peaks: the first one in 2020 and the second one in 2025, due to the redemptions of Eurobonds in that years. Moreover, at the first peak the debt service/budget revenues ratio exceeds the threshold under all scenarios, while at the second one it does so only under the historical and the "most extreme shock" scenarios. The "most extreme shock" scenario

for the first ratio is the low growth rate of exports (historical growth rate minus 1 unit of standard deviation), while for the second ratio it is the one-time 20% depreciation of the exchange rate.

After 2026, both debt service/exports and debt service/budget revenues ratios are mostly stabile under the baseline and the "most extreme shock" scenarios, while under the historical scenario the first ratio exceeds the threshold in 2034, and the second one falls below the threshold in 2026, after which exceeds it again in 2028.

Figure 4: Debt service/exports and debt service/budget revenues


3.3. Sustainability analysis for RA Government debt

In the projection horizon, the NPV of public debt/GDP ratio crosses the threshold under the "most extreme shock" scenario (low economic growth (historical growth rate minus 1 unit of standard deviation)), and the historical scenario. It reaches 85.1 percent under the first scenario, and 82.4 percent under the second one. Under the baseline scenario, the ratio has a gradual decreasing trend in the projection horizon, while under the constant primary balance scenario it is mostly stabile.

Figure 5: Public debt burden under the baseline and alternative scenarios

NPV of debt/GDP
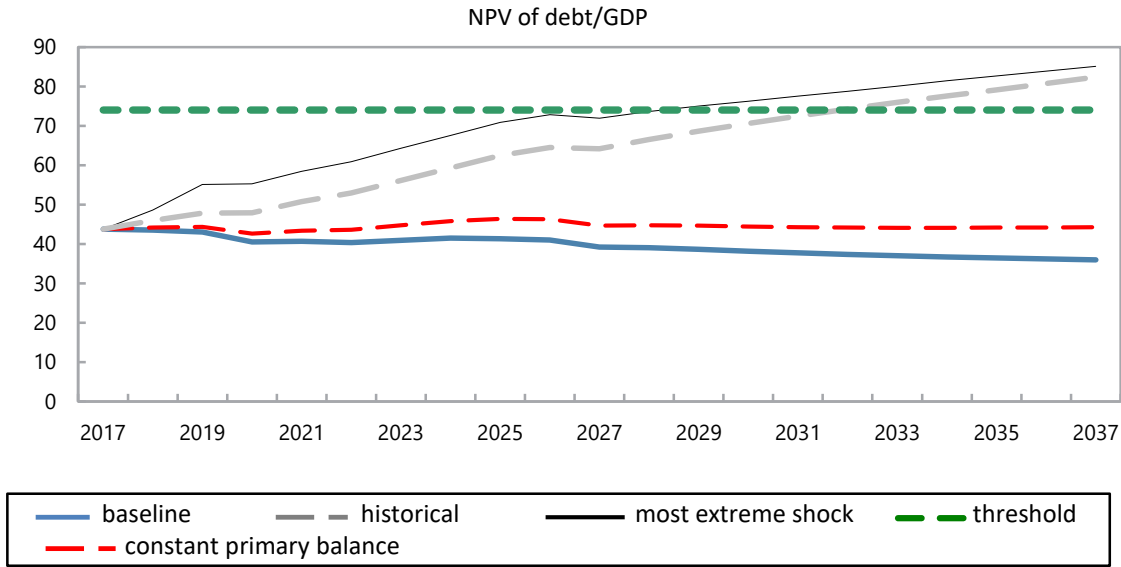
The NPV of public debt/budget revenues ratio has an increasing trend under the "most extreme shock" (low economic growth) and historical scenarios, and reaches 313.9 and 304 percent, respectively, at the end of the projection period. The trend is a decreasing one under the baseline and constant primary balance scenarios (see Figure 6). In fact, there are significant risks in the RA public debt in case of a long-term low economic growth.

Figure 6: Public debt burden under the baseline and alternative scenarios

NPV of debt/budget revenues
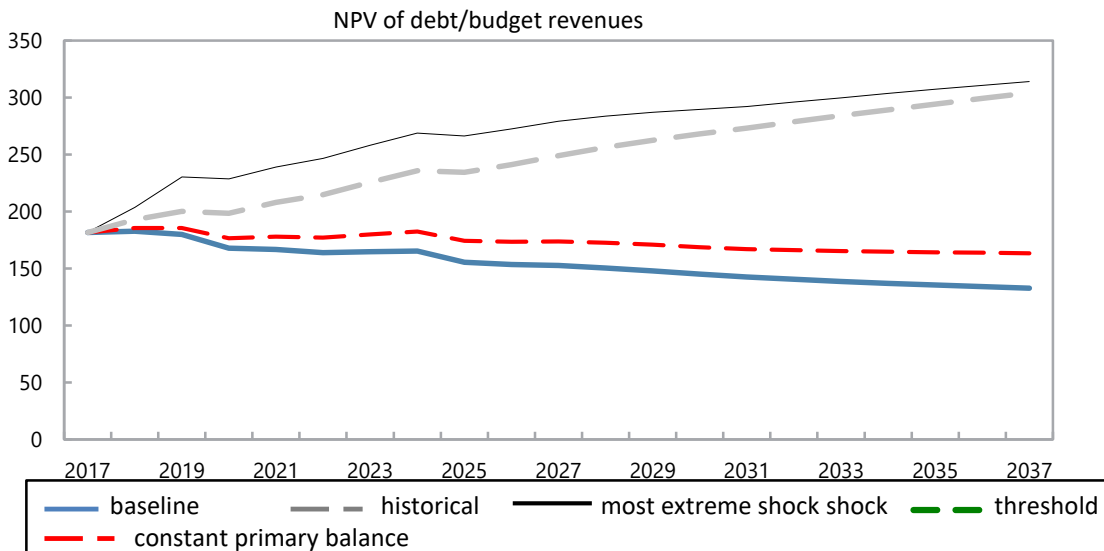
The public debt service/budget revenues ratio has a fluctuating behavior in the first half of the projection period, and a stabile behavior in the second half.

In the period succeeding the Eurobond redemptions, the ratio has an increasing trend under the historical and the "most extreme shock" (low economic growth) scenarios, and a decreasing trend under the baseline and the constant primary balances scenarios (see Figure 7).

Figure 7: Public debt service under the baseline and alternative scenarios

Public debt service/budget revenues
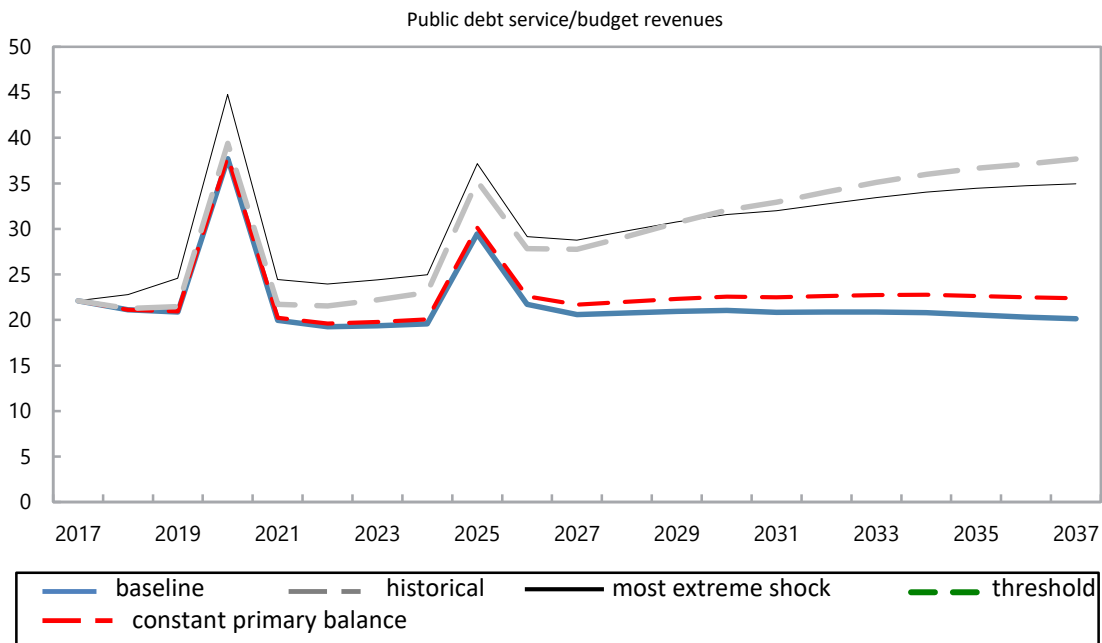
4. Conclusions

Summarising the RA debt sustainability assessment it is possible to make the following conclusions:

- The RA public debt has drastically increased in 2009, has continued the increase with a weaker temp until 2013, and has accelerated in 2015 and 2016, due to the necessity to counteract the impact of the external shocks experienced by the RA economy through stimulating fiscal policy.

- In 2016 the RA public debt was 5942 bln. USD, the debt/GDP ratio - 56.6 percent. In the medium-term, the debt will bear the impact of the gradual reduction of the fiscal deficit, and then will gradually decrease below the level programmed for 2017.

- **The results of the RA Government debt sustainability analysis show that the RA Government debt is sustainable in the long-term, but is sensitive to economic growth and exchange rate shocks:**

  - ✓ **At present, the RA Government debt is within the moderate risk range.** In the result of the DSA, for both external and public debt, all indicators were below the defined threshold levels under the baseline scenario, except for the external debt service/budget revenues indicator. For the majority of the indicators, the thresholds are violated under the "historical" scenario, while for the NPV of public debt/GDP indicator a violation is registered under the "most extreme shock" scenario as well.

  - ✓ **The RA Government debt sustainability is more sensitive to the exchange rate depreciation and low economic growth.** The "most extreme shock" scenarios for the external public debt are: the 20% depreciation of AMD, the low economic growth and the low growth rates for exports in the long-term. The "most extreme shock" scenario for the public debt is the long-term low economic growth.