

Assessing the impact of recent reforms in the tax administration

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Introduction

During 2014-2015, the Main State Tax Inspectorate (STS) of Moldova, supported by SIDA, as well as other donors (World Bank, IMF, USAID/BRITE and EU), implemented a series of fundamental reforms. The interventions were primarily aimed at increasing the efficiency of tax administration and stimulating the voluntary fiscal compliance by easing the communication and interaction between fiscal authorities and taxpayers.

This report aims to undertake an assessment of the net impact of these reforms. The analysis will be based on econometric, statistical, as well as qualitative methods, reflecting the evolution of the fiscal system in the last couple of years, with a primary focus on tax collections and interaction with the taxpayers. The report follows three specific objectives:

1. to provide a robust evidence about the net impact of reforms implemented by the STS during 2014-2015, by comparing the performance in this period with the previous years (2010-2013);
2. to communicate and widely promote the assessment conclusions in media and among relevant stakeholders;
3. to raise awareness within STS, entire government and the general public, about the importance to continue the recent reforms and to ensure their irreversibility.

In order to achieve the stated objectives, the authors conduct an in-depth analysis of the dynamics and structure of tax collections administered by STS, the prevention, counteracting and incentivising measures implemented by this institution in order to fight tax evasion and stimulate fiscal compliance, as well as relevant international rankings. However, a key challenge in assessing the impact of reforms is to isolate the impact of other factors that, traditionally, influence tax performance (e.g. GDP, consumption, inflation etc.) from the impact of policy interventions. In order to find this net impact, the authors resorted to statistical and econometric estimations that allow controlling for the mentioned “traditional factors” and depicting the impact of reforms (positive shocks).

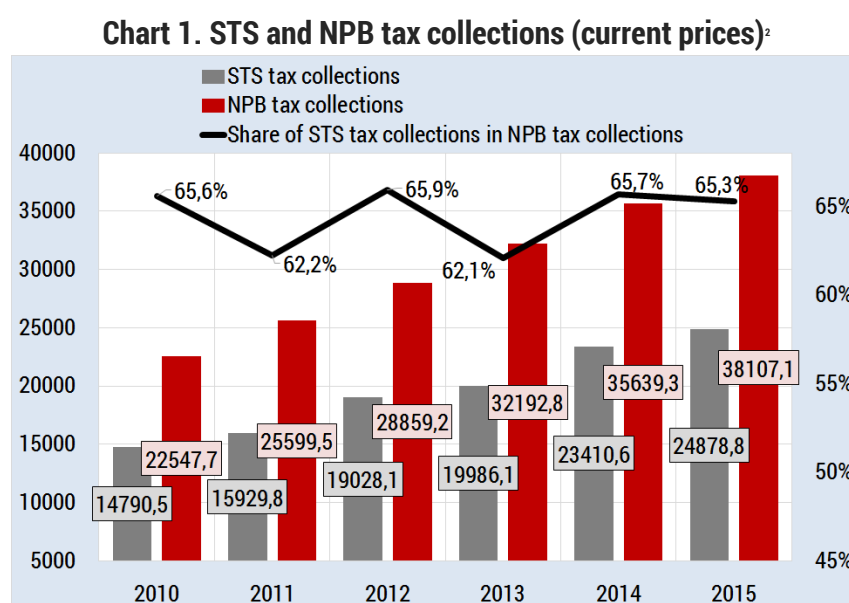
The report structure is aligned to fulfilling its specific objectives. Thus, in its first section, the report provides a detailed analysis of recent trends in tax administration and tax collection. The second section is dedicated to econometric estimations of the net impact of reforms on tax collections. The last section of the report is dedicated to key conclusions and recommendations based on the conducted assessment. The report also contains a set of annexes. Thus, annex A provides details about key reforms promoted by Swedish Tax Authority (STA) and STS, while the annex B describes the regression results.

Recent trends in tax administration and tax collection

In this section, we try to identify the link between qualitative indicators, such as compliance, awareness and responsibility, with the quantitative outcomes, such as tax revenues collected by STS, tax arrears etc.. Particularly, we focus on displaying evolutions during the analysed period of time (2010 – 2015), by comparing the performance and tax receipts between two sub-periods (still, for some indicators we limit the analysis of impact of reforms only for 2015, because the effect of some interventions could not be noticed in 2014):

1. The period before the recent reforms: 2010-2013 (hereafter: “baseline period”)
2. The period after the start of most recent reforms: 2014-2015 (hereafter “reforms’ period”).

During the analysed period of time, the STS tax collections as a share of the National Public Budget (NPB) tax collections followed an uneven path, ranging at around 65% (chart 1). In the reforms’ period (2014-2015), the share seems to stabilize, compared to the baseline period (2010-2013). Still, the time series is too short to make stronger conclusions, while the effect of reforms has yet to be seen in the upcoming years.



Source: STS (STS tax collections), Ministry of Finances (NPB tax collections) and authors calculations (share of STS tax collections in NPB tax collections).

Nevertheless, we can already spot some marginal improvements on the side of STS tax collections during the reforms’ period, compared to the baseline period. During 2014-2015, the average real growth rate of STS tax collections, despite being lower than in the baseline period, outperformed the

¹ The authors recognize that during 2010-2013, the STS has also been involved in many important reforms. However, for the purpose of this report, we consider it as a baseline period and focus our analysis on the most recent reforms, implemented during 2014-2015.

² The author uses nominal terms for transparency purposes, as well as because the goal of the chart is to compare STS and NPB tax collections (both are exposed to similar inflationary pressures and, hence, transforming the series into constant prices will not make much difference).

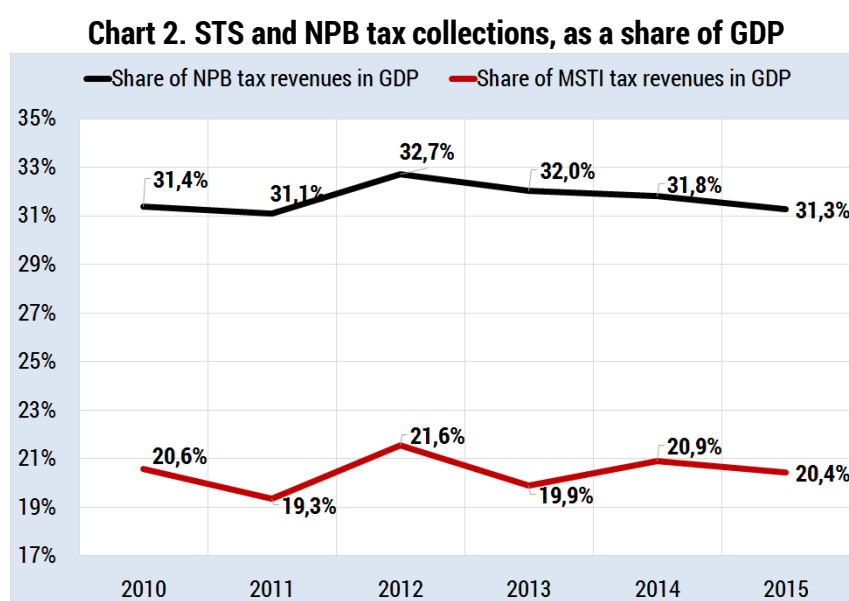
average real growth rates in NPB and GDP (during 2011–2013 it underperformed both) (table 1). Thus, during the reforms' period, STS managed to increase the amount of tax collections, in real terms, on average by 2.7%, despite the decline in total tax collections to NPB and a slow economic growth. It points on the first effects of higher fiscal base that could be explained improvements in fiscal compliance.

Table 1. Comparison between the growth rates in STS tax collections, BPB tax collections and GDP, during the baseline period and reforms' period (in real terms)

	2011-2013	2014-2015
STS tax collections	+4.8%	+2.7%
NPB tax collections	+6.6%	-0.1%
GDP	+5.2%	+2.2%

Source: Authors' calculations based on the data of the STS, the Ministry of Finances and the NBS

STS tax revenues as a share of GDP remained relatively constant, hovering at around 19-20%, whereas the share of total NPB tax collections in GDP followed a downward trend during the last three years, declining from 32.7% in 2012 to 31.3% in 2015 (chart 2).

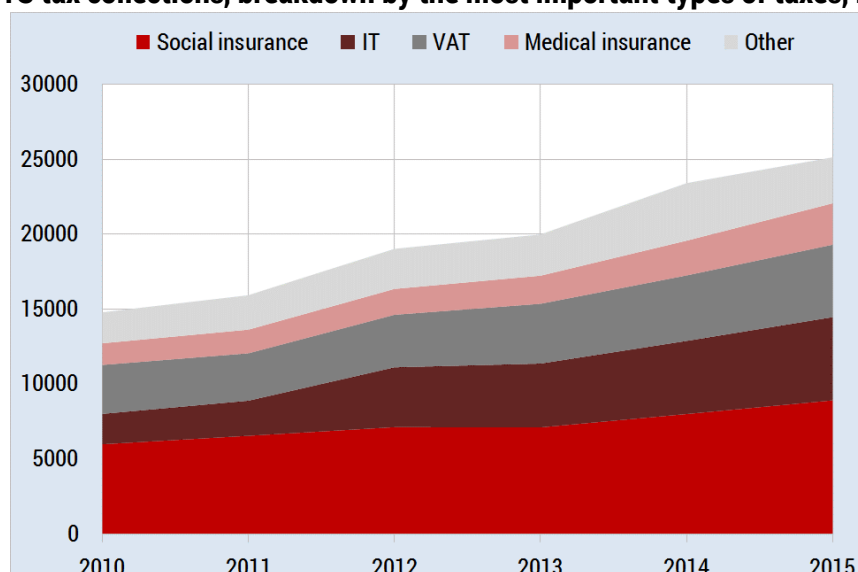


Source: Authors' calculations based on State Tax Service data (STS tax collections), Ministry of Finance data (NPB tax collections) and National Bureau of Statistics (GDP)

The growth in STS tax collections during 2014-2015 was relatively balanced, being driven by most types of taxes administered by the institution (chart 3). It suggests that this dynamics is explained by horizontal factors, rather than by isolated interventions, boding well for the sustainability of this trend in the near future.

³ We did not take into account the 2010 year, because it was a recovery year after the deep recession of 2009. Inclusion of this year would undermine the comparability of both analysed periods.

Chart 3. STS tax collections, breakdown by the most important types of taxes, million MDL



Source: Authors' calculations based on the data of the STS

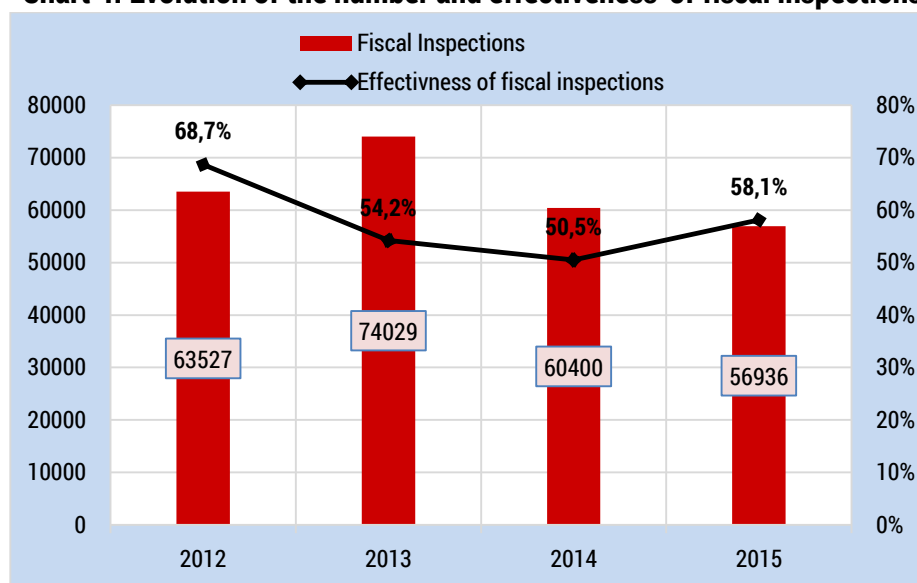
The year 2015 – turning point for fiscal compliance

The impact of recent reforms in the area of fiscal compliance became the most obvious in 2015. Despite difficult economic conditions, the STS tax receipts surpassed those of 2014 by 6%, while in Q1:15, when the income taxes are collected, the revenues increased by 28% compared to Q1:14, and exceeded the planned threshold for the same period of time by 66.3%.

This growth happened on the grounds of improved fiscal compliance, as a result of a series of prevention measures implemented by the STS during 2015 targeted to a series of taxpayers under monitoring: sending 4083 conformation letters, organizing 2780 conformation roundtables with managers, organizing 1930 seminars on methodological assistance, and making 1035 consultation visits to the.

Additionally, in order to amplify the risk of detection the STS focused on increasing the effectiveness of fiscal inspections. During 2015, the detection rate of fiscal inspection soared from 50.5% to 58.1% compared to 2014. Although it remains relatively low, it occurred amid decreasing number of fiscal inspections (chart 4).

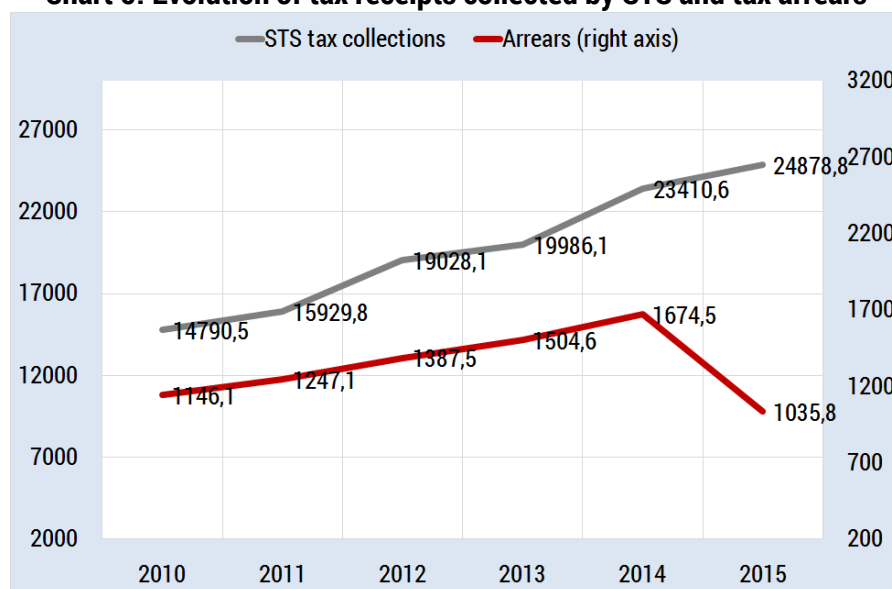
Chart 4. Evolution of the number and effectiveness of fiscal inspections



Source: STS

In addition to the mentioned interventions, the interaction between fiscal authorities and taxpayers has been improved due to the simplification of tax procedures and development of online services that sped up the communication, the filling up of documents and the processing of tax applications. As a result, the year 2015 registered a 20% increase in fiscal declarations compared to 2014 and, for the first time in the history of STS, the stock of arrears declined (by MDL 638.7 million compared to 2014, to the level of MDL 1094.5 million (chart 5).

Chart 5. Evolution of tax receipts collected by STS and tax arrears



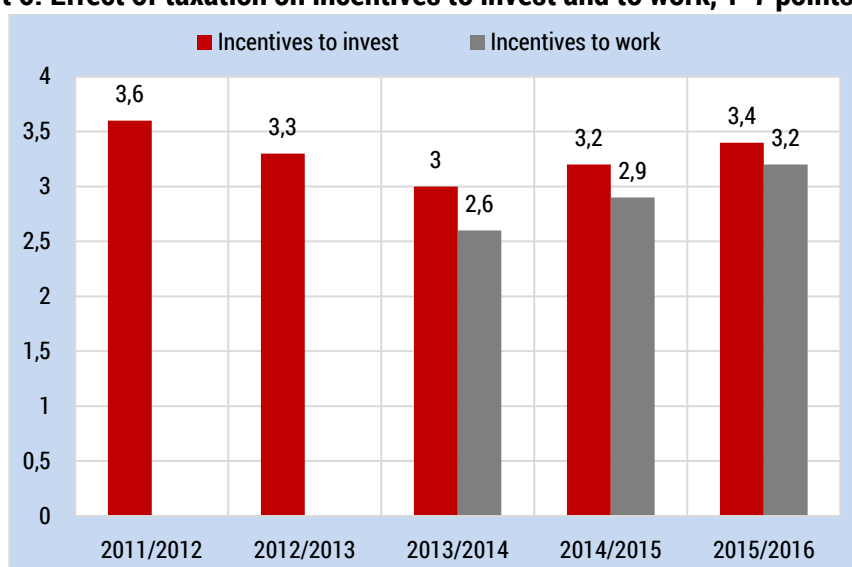
Source: STS

· Share of inspections which uncovered breaking of the fiscal legislation.

Evolutions in international rankings

The positive dynamics of 2014-2015 has been also reflected by relevant international rankings. For example, the Global Competitiveness Reports (GCR) during 2011-2016⁵ revealed a constant improvement according to two relevant indicators: (i) Effect of taxation on incentives to invest⁶, and (ii) Effect of taxation on incentives to work⁷. Thus, if GCR editions of 2011/2012, 2012/2013 and 2013/2014, covering the period 2010-2013, revealed a continuously worsening effect of taxation on incentives to invest (the index declined from 3.6 points to 3.0 points, out of 7.0 points maximum), the last two editions showed some improvement. Thus, the GCR editions for 2014/2015 and 2015/2016, that covered the period of reforms (2014-2015), posted an increase in the index of the effect of taxation on incentives to invest to 3.4 points. Similar trend has been recorder by the index of the effect of taxation on incentives to work (there are no data for the period before the GCR edition of 2013/2014).

Chart 6. Effect of taxation on incentives to invest and to work, 1-7 points (best)



Source: World Economic Forum, Global Competitiveness Report (previous editions)

Importantly, as in the case of previously analysed indicators, both indexes showed improvement in the effect of taxation on incentives to invest and work, even during the economic recession of 2015. Moreover, if in the previous editions, the issue of tax regulations as a barrier for doing business (as perceived by firms) got scores between 7.6 and 7.8, in 2015/2016 edition, it declined to only 4.7, meaning that the share of firms that perceive tax regulations as a major problematic factor for doing business decreased. Obviously, this progress could be explained by the increased relevance of other, more fundamental, issues (e.g. corruption, political instability etc.). Still, given the visible change in trend in 2014-2015 that coincided with the start of recent reforms in tax administration, we can draw

⁵ The editions reflected the period 2010-2015 (due to methodological peculiarities, the report in year t (e.g. 2015-2016) reflects the situation for the year $t-1$ (e.g. 2014-2015).

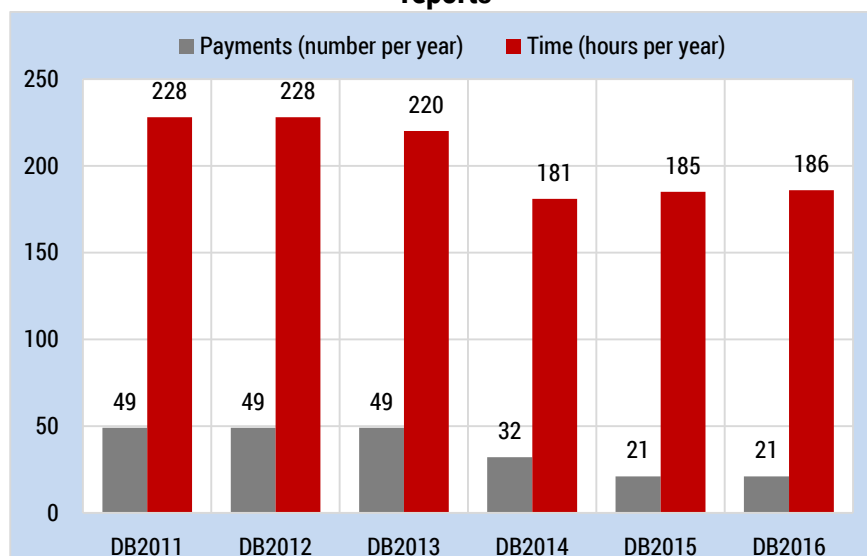
⁶ Measured by collecting the answers to the question: "In your country, to what extent do taxes reduce the incentive to invest? [1 = to a great extent; 7 = not at all]"

⁷ Measured by collecting the answers to the question: "In your country, to what extent do taxes and social contributions reduce the incentive to work? [1 = to a great extent; 7 = not at all]"

a preliminary conclusion that these recent improvements, at least partly, owed to the ongoing reforms implemented by the STS.

Positive evolutions were also spotted by the Doing Business reports, according to the section related to the interaction with taxpayers (Paying Taxes section). Particularly, the number of tax payments and time to complete the tax payments, as revealed by the report editions of 2014, 2015 and 2016, were much lower compared to the previous years (chart 7).

Chart 7. Number of tax payments and time related to paying taxes, according to Doing Business reports



Source: World Bank

Preliminary conclusions

During the period of recent reforms (2014-2015), tax administration and the interaction with the taxpayers marginally improved. The tax revenues collected by the STS outperformed the growth of total fiscal collections into NPB and the GDP growth (in real terms). The growth was quite balanced, as it was recorded by most types of taxes administered by STS, revealing the prevalence of horizontal/structural factors, and not of temporary one-off events. Positive trends were, also, recorded by relevant international rankings, namely the Global Competitiveness Reports and Doing Business reports. The improvements in the interaction with taxpayers were revealed by the decline in the time and costs of paying taxes, as well as in the number of fiscal inspections amid their increased effectiveness. These improvements happened on the background of reforms aimed at improving the tax administration and incentivising tax compliance, implemented by STS with the consistent help of Moldova's key development partners. Given the fact that during 2014-2015 there were few factors that could boost the tax collections, we could reasonably consider that these performances owed primarily to recent reforms. The next chapter provides a more rigorous analysis about the net impact of these reforms on tax collections, by controlling for "usual suspects" that influence tax collections (e.g. GDP, consumption, inflation etc.).

Assessing the net impact of reforms on tax collections

Often, correlation does not necessarily reveal causality. Thus, at least theoretically, the optimistic conclusions from the previous chapter, about the positive evolution of tax collections amid reforms in tax administration and interaction with taxpayers, could be caused by many other factors, not related to recent policy interventions. For example, in 2015 these dynamics could be caused by increased inflation that boosted nominal tax collections or by currency depreciation that boosted the MDL denominated remittances and, respectively, consumption. In order to control for all explanatory factors and better understand the net impact of reforms on tax collections we resort to econometric analysis.

Methodology

The main peculiarities of the methodological approach are presented below:

- The assessment of the net impact of reforms is conducted for the 2015 year only. The reason is that 2014 year may not be sufficiently relevant as the impact of reforms that started in the same year may come with some time lag. Thus, covering 2014 could generate biased results and may distort the estimation of the net impact of reforms.
- The assessment will focus on the impact estimation of all other factors that positively influenced tax collections in 2015, besides the fundamental explanatory factors (those that determined the dynamics in the previous years). We assume that in 2015, there were no other major factors that boosted tax collections, except for the reforms conducted during 2014-2015.
- The assessment is conducted for the tax collections administered by STS only. The reason lies in the main purpose of this report, which is about estimating the net impact of reforms implemented by the STS.

The assessment followed three key steps:

1. *Estimating the key explanatory factors for tax collections.* In this regard, we tested, using econometric methods, the statistical significance of the most common factors that could best explain the dynamics in tax collections. Particularly, the following variables were tested: Gross Domestic Product (GDP), consumption, wages, inflation, national currency exchange rate and exports. All variables were expressed in natural logarithms (except for CPI) and seasonally adjusted using TRAMO method. Importantly, the estimation was conducted for the period 2010-2014, on quarterly data series. There are two reasons for running the regression on the selected time span: (i) in order to be able to forecast the expected value of tax collections for 2015 (see next step of the methodology), and (ii) in order to have enough observations to estimate the regression and forecast.
2. *Forecasting the expected levels of tax collections.* Based on the regression estimated in the previous step, we run the forecast for 2015. Thus, we obtained the expected value of tax

collections, based on the evolution of the identified explanatory variables in 2015. The obtained numbers are considered as tax collections that should have occurred without reforms.

3. *Estimating the net impact of reforms* based on the difference between de facto tax collections and the expected ones (estimated in the previous step). The obtained difference is the net impact of factors, other than those estimated in the first step of the methodology. The estimated net impact should be attributed, primarily, to the reforms conducted during 2014-2015, because in 2015 there were no other major factors that would spur tax collections.

Estimation

Step 1: Estimating the key explanatory factors of the taxes collected by the STS

All possible specifications revealed that the most consistent model specification is the following:

$$\ln(\text{taxcollections})_t = \beta_0 + \beta_1 * \ln(\text{consumption})_t + \beta_2 * CPI_t^2 + \beta_3 * outlier + \varepsilon_t$$

where:

$\ln(\text{taxcollections})_t$	Taxes collected by STS and payed to the National Public Budget, million MDL, natural logarithms
$\ln(\text{consumption})_t$	Final consumption, million MDL, natural logarithms
CPI_t^2	Squared Consumer Price Index, y-o-y, % (the variable has been squared because of the non-linear relation between inflation and tax collections: inflation can positively influence nominal tax collections up to a certain point where excessive inflation has mainly distortionary effects).
<i>outlier</i>	Dummy variable standing for quarter 4, 2013, due to unexplained decline in tax collections in that period.
$\beta_0, \beta_1, \beta_2, \beta_3$	Regression coefficients (coefficients that show how tax collections should change, given a change in any of the explanatory variables).
ε_t	Error terms (factors not included into the regression that can influence tax collections)

All explanatory variables are statistically significant, while the model is able explain 89% of variations in the explained variable, meaning that final consumption, inflation and the dummy variable for Q4:13 are sufficient to explain the dynamics in tax collections (there are only few other factors that are left behind the model). Additionally, the basic tests reveal the robustness and reliability of the model, allowing us to use it for further estimations (see Annex B for more details on regression results).

We obtain the following regression estimates, using Ordinary Least Squares method:

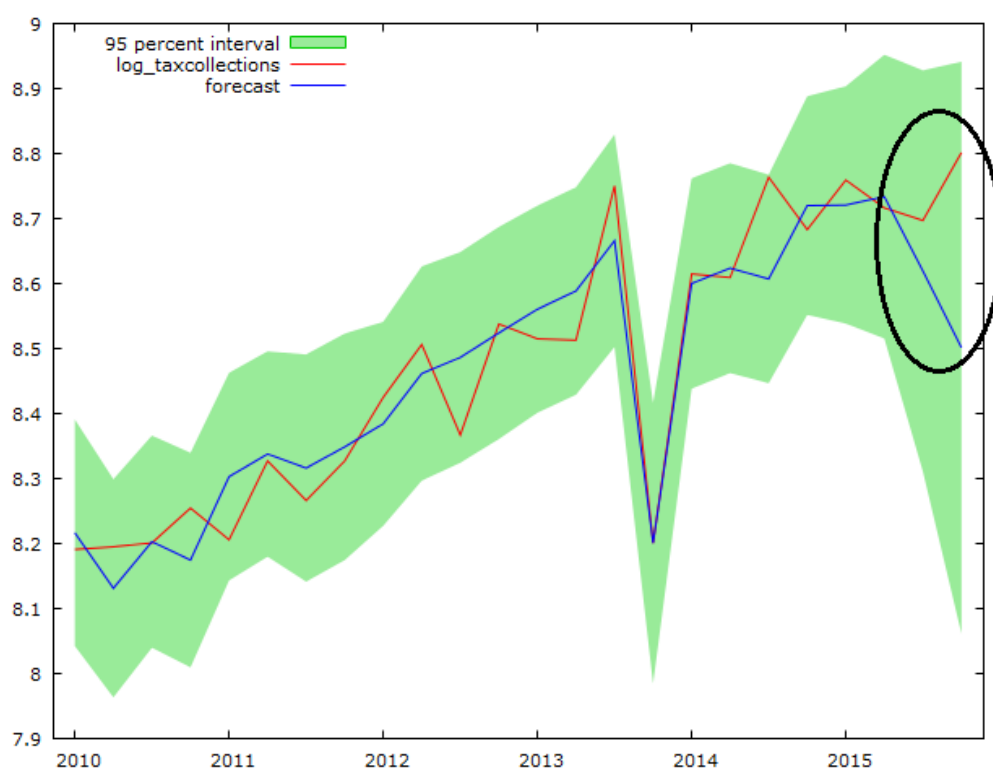
$$\ln(\text{taxcollections})_t = 1.4 * \ln(\text{consumption})_t - 0.3 * CPI_t^2 - 0.4 * outlier$$

Thus, tax collections are positively influenced by final consumption (1 p.p. boost to the growth in final consumption, leads to 1.4 p.p. acceleration in the growth of tax collections) and negatively influenced by high inflation, measured by squared CPI. It reveals the high dependency of the Moldovan tax system on domestic demand, given the peculiarities of the national economy, while the high inflation has distortionary effects on tax collections.

Step 2. Forecasting the expected levels of tax collections

Based on regression estimated in step 1, we conduct in sample forecast for the period Q1-Q4:15 and compared the expected values with the realized ones. Based on chart 7 we can notice that the estimated model has a relatively strong predictive power, as the differences between forecasted and realized tax collections are minor throughout the time span. The only exception is the year 2015, when this gap rapidly widened. Particularly, despite the model predictions about the decline in tax collections in current prices, de facto, they increased. It is explained by the fact that in 2015 interfered additional factors, besides consumption and inflation, which positively influenced the dynamics of tax collections. Given the fact that 2015 was a period of recession, decline in consumption and rising inflation, there were no other factors except for the reforms implemented by STS that boosted tax collections.

Chart 8. Forecasted and realized tax collections



Source: Authors' estimations

Step 3. Estimating the net impact of reforms

Assuming the reforms implemented by STS serve as the main factor explaining the positive dynamics of tax collections, given the weak fundamentals, we estimated the net impact of reforms according to the following formula:

$$\text{Net impact of reforms} = \text{Realized (tax collections)} - \text{Forecasted (tax collections)}$$

According to our estimations, in 2015, the STS managed to collect by MDL 2.3 billion more taxes than the level predicted by the fundamentals (consumption and squared inflation). As argued above, this difference can be primarily explained by the recent reforms in tax administration implemented by STS, as there were no other factors that could boost tax collections in 2015.

However, the estimation process should not stop here. During 2015, the national currency saw a 25% depreciation. For an economy that heavily depends on foreign trade and remittances, it boosted the MDL denominated revenues of many households and firms, with corresponding impact on STS collections. Although, the effect of currency depreciation is taken implicitly into account in our regression through consumption (depreciation led to higher consumption in MDL, which translated into MDL denominated STS collections), it is worth running a separate regression that would directly control for currency fluctuations.

In this respect, we run the following regression, with the variables converted into USD, using the average official exchange rates:

$$\ln(\text{taxcollections})_t = \beta_0 + \beta_1 * \ln(\text{consumption})_t + \beta_2 * \text{outlierQ4: 13} + \beta_3 * \text{outlierQ3: 14} + \varepsilon_t$$

where:

$\ln(\text{taxcollections})_t$	Taxes collected by STS and payed to the National Public Budget, million USD, natural logarithms
$\ln(\text{consumption})_t$	Final consumption, million USD, natural logarithms
outlierQ4: 13	Dummy variable standing for quarter 4, 2013, due to unexplained fluctuation in tax collections in that period
outlierQ3: 14	Dummy variable standing for quarter 3, 2014, due to unexplained fluctuation in tax collections in that period.
$\beta_0, \beta_1, \beta_2, \beta_3$	Regression coefficients (coefficients that show how tax collections should change, given a change in any of the explanatory variables).
ε_t	Error terms (factors not included into the regression that can influence tax collections)

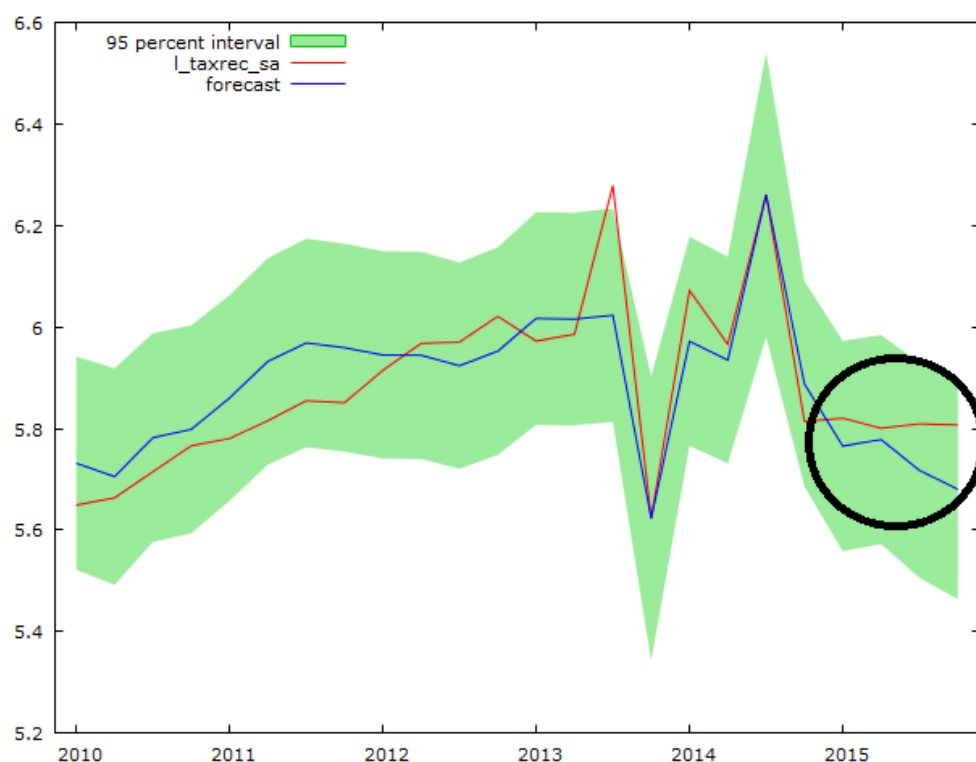
We obtain the following regression estimates, using Ordinary Least Squares method:

$$\ln(\text{taxcollections})_t = 0 + 1.1 * \ln(\text{consumption})_t - 0.4 * \text{outlierQ4:13} + 0.4 * \text{outlierQ3:14}$$

As in the case of the previous regression, the STS tax collections are positively influenced by final consumption (1 p.p. boost to the growth in final consumption, leads to 1.1 p.p. acceleration in the growth of tax collections). It reiterated the high dependency of the Moldovan tax system on domestic demand.

By applying the same methodology described before, we conclude that the realized STS collections denominated in USD performed better in comparison with the predicted levels, pointing on the marginally positive net impact of reforms. The total difference is about MDL 1.8 billion, which is a slightly more conservative estimate compared to the previous estimation of MDL 2.3 billion (Chart 9).

Chart 9. Forecasted and realized tax collections



Source: Authors' estimations

Conclusions

The reforms started by STS in 2014 brought certain tangible results in a relatively short period of time. During 2014 and 2015, the tax revenues collected by STS performed better compared to total NPB tax collections, as well as the GDP growth (during the baseline period, the SFS fiscal collections grew slower than GDP and NPB). The interaction with taxpayers also improved, as the tax base expanded due to a larger fiscal compliance, decrease in time and costs of paying taxes, optimization of the number of tax inspections coupled with their increased efficiency.

The net impact of recent reforms could be easily spotted in 2015. Thus, amid economic recession, decline in consumption and macroeconomic instability, the estimated net impact of recent reforms implemented by STS ranged around MDL 1.8 - 2.3 billion - additional tax collections to the state budget in 2015 (without reforms, the tax collections would have been by MDL 1.8 - 2.3 billion less than de facto levels). Although, it accounts for only 7-9% of total STS revenues in 2015, it is a rather good result for the first year after the start of reforms, and augurs well for the next years if the pace of reforms will not slow down.

In order to maintain these developments in the next years, it is necessary to continue the reforms started recently and eliminate key constraints for ensuring irreversible changes. Some of these obstacles lie in the hands of the STS management and should be properly addressed. The main challenges are related to the unstructured work, frequent relocation of employees among different jobs and departments, lack of relevant reporting, and uncertainty about work objectives among employees. More severe is that the management of the Tax Administration remains to be tied up in short leash by the Ministry of Finance, which significantly limits the exercise of authority for management. Addressing these challenges in the near future could set the STS on a sustainable development process, with positive spillovers for the entire economy.

Annex A. Review of key reforms implemented by STS with SIDA support

The ongoing cooperation between the Swedish Tax Agency (STA) and the Main State Tax Inspectorate (STS) in Moldova, that started in late 2013, is based on three components: (i) General Management; (ii) Taxpayer Service; and (iii) Tax Audit. Since then, STS have been able to deliver visible results in all areas where missions have been implemented and the cooperation rests on a solid foundation of trust and respect which is essential for the transparency and openness. Results and changes achieved will be described further down.

Component General Management

In this component, the baseline when the project started was such that there were situations that can be described as frenetic activity and controlled chaos. The main reasons for this were overwhelming administrative procedures, inadequate governance and lack of measurable objectives. To this should be added that the work procedures and objectives shifted so rapidly that the follow-up over time in practice was not possible. There was there for an overall need to elaborate and establish new planning and follow-up processes and to develop and implement new evaluation indicators.

Assistance was planned to have these in place and the project output and to have them implemented as tools for management monitoring and evaluation.

It became clear almost immediately that the almost non-existent long-term monitoring and evaluation was a result of the requirements that management constantly has to demonstrate rapid and concrete results in the form of payments to the state budget, combined with the highly unpredictable employment conditions for management and their in reality limited legal possibilities to control the tax regions.

In the bill that would make the tax administration one legal entity there was proposals for predetermined assignments for the top management for up to 5 years with the possibility to be prolonged once.

The main activates/output had been to read and comment on the law proposal and to elaborate a plan for a unified tax administration with the steps that must be taken to form a unified authority when the law is in place.

To a lesser extent, the focus has been on what was planned to be the main activities in this component as it became obvious that there is a good will, decent skills but aggravating practical obstacles to introduce better monitoring and evaluation.

Awareness of the need to work with structured follow-up monitoring and evaluation has nevertheless increased sharply as the necessity to monitor and evaluate is something we try to emphasize in all sub-components. So there is a change in the way people are thinking, unfortunately they cannot always use this knowledge.

Component tax payer Service

In this component the outcome is to see revenues increase by other means than control. It can also be described as increased voluntary compliance due to changes in the way the tax administration interacts with taxpayers that in turn leads to changes in taxpayer behavior.

The activities/output has broadly been to elaborate a plan and strategy for communication and guidelines on how to interact with and provide information to groups of taxpayers. This includes an information strategy to be used within the administration, to use an accurate and easy language and to work with attitudes. We have also had media trainings and performed a tax payer survey to measure observed changes in behaviors amongst employees and tax payers.

Looking at the overall progress, changes in attitudes, behaviors and means when interacting with taxpayers are the most significant. The STS has launched vast information campaigns where the messages has been easier to understand and formulated in a more informative way then earlier.

When talking to employees working in various tax offices they all confirm that there are now increased focuses on service and attitudes and they feel that tax payers' confidence is increasing as they try to focus more on tailor made information to groups and individuals. For themselves the new approach means less conflicts with tax payers and therefor an easier work.

Component Tax Audit

In this component the outcome is to increase tax revenues by using risk-based selection for tax controls, improve tax audit procedures, focus on taxes instead of penalties and also concentrate on particular areas where risk are perceived as especially high or knowledge is poor.

There is substantial progress also in the Tax Audit component but changes in this area take longer time. One reason for this may be the much more vast experience there is in Tax Audit than in Taxpayer Service as it is more difficult to change ingrained practices than introducing new ones. Another reason might be that corruption unfortunately exists also in the Tax Administration and that new working methods regarding tax control could affect the opportunities for corruption.

Another obstacle is the present legislation according to which all liquidated companies has to be audited before they can be deregistrated despite the fact that it almost never result in additional revenues. Yet another problem is that only approx. 10 % of the tax investigation capacity is used on controls initiated by the tax administration. The rest is on request from other state agencies and most often without any tax issues involved.

Despite all this we see changes in behavior in the tax administration and that risk based selection is the "normal" way to select controls in those cases initiated by STS. Working procedures have and are changing and there seems to be an increasing will to change working methods.

Annex B. Regression results and tests

Model: OLS, using observations 2010:1-2015:4 (T = 24)

Dependent variable: $\ln(\text{taxcollections})$

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	-1.86596	1.51309	-1.2332	0.2353	
Outlier	-0.444129	0.0765796	-5.7996	<0.0001	***
$\ln(\text{consumption})$	1.40749	0.201569	6.9827	<0.0001	***
sqCPI	-0.00225076	0.00111679	-2.0154	0.0610	*
Mean dependent var	8.422761		S.D. dependent var	0.195329	
Sum squared resid	0.082862		S.E. of regression	0.071964	
R-squared	0.885693		Adjusted R-squared	0.864261	
F(3, 16)	41.32480		P-value(F)	9.22e-08	
Log-likelihood	26.48431		Akaike criterion	-44.96863	
Schwarz criterion	-40.98570		Hannan-Quinn	-44.19112	
rho	-0.305139		Durbin-Watson	2.575791	

White's test for heteroskedasticity -

Null hypothesis: heteroskedasticity not present

Test statistic: LM = 2.53777

with p-value = $P(\text{Chi-square}(6) > 2.53777) = 0.864217$

LM test for autocorrelation up to order 4 -

Null hypothesis: no autocorrelation

Test statistic: LMF = 0.347417

with p-value = $P(F(4, 12) > 0.347417) = 0.840838$

Test for normality of residual -

Null hypothesis: error is normally distributed

Test statistic: Chi-square(2) = 1.55631

with p-value = 0.459252

Model: OLS, using observations 2010:1-2015:4 (T = 24)

Dependent variable: $\ln(\text{taxrec_sa})$

	<i>Coefficient</i>	<i>Std. Error</i>	<i>t-ratio</i>	<i>p-value</i>	
const	0.685567	0.96548	0.7101	0.4859	
$\ln(\text{cons_sa})$	1.07656	0.200175	5.3781	<0.0001	***
d2	-0.369604	0.0993879	-3.7188	0.0014	***
d3	0.371752	0.0970657	3.8299	0.0010	***
Mean dependent var	5.882251		S.D. dependent var	0.168340	
Sum squared resid	0.180147		S.E. of regression	0.094907	
R-squared	0.723608		Adjusted R-squared	0.682149	
F(3, 20)	17.45362		P-value(F)	8.33e-06	
Log-likelihood	24.64988		Akaike criterion	-41.29976	
Schwarz criterion	-36.58754		Hannan-Quinn	-40.04961	
rho	0.350559		Durbin-Watson	1.234111	

White's test for heteroskedasticity -

Null hypothesis: heteroskedasticity not present

Test statistic: LM = 6.49051

with p-value = $P(\text{Chi-square}(4) > 6.49051) = 0.165389$

LM test for autocorrelation up to order 4 -

Null hypothesis: no autocorrelation

Test statistic: LMF = 1.6911

with p-value = $P(F(4, 16) > 1.6911) = 0.201124$

Test for normality of residual -

Null hypothesis: error is normally distributed

Test statistic: Chi-square(2) = 4.45685

with p-value = 0.107698