TECHNICAL ASSISTANCE REPORT

REPUBLIC OF ARMENIA
Personal Income Tax and Social Security Contribution Gaps

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Prepared By

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Contents

Abbreviations and Acronyms

AMD	Armenian Dram - the currency of Armenia
ARMSTAT	Statistical Committee - Republic of Armenia
CD	Capacity Development
CIT	Corporate Income Tax
FAD	Fiscal Affairs Department
GDP	Gross Domestic Product
GPFP	Global Public Finance Partnership
ILO	International Labor Organization
IMF	International Monetary Fund
LFS	Labor Force Survey
MoF	Armenian Ministry of Finance
NACE	Nomenclature of Economic Activities
PIT	Personal Income Tax
SRC	State Revenue Committee of Armenia
SSC	Social Security Contributions
SSSS	State Social Security Service
STX	Short Term Expert
TA	Technical Assistance
TIN	Taxpayer Identification Number
VAT	Value Added Tax

Preface

In response to a request from the Chairman of the Armenia State Revenue Committee (SRC), a capacity development (CD) mission team comprising Mr. Graham Whyte, Fiscal Affairs Department (mission lead) and Mr. Soren Pedersen (both FAD) and Mr. Tobias Gabel Christiansen (FAD short-term expert), undertook a scoping mission (providing in country and remote support) during the period September 2 – 10, 2024. The purpose of this mission was to undertake a comprehensive review of data availability for estimating the Personal Income Tax (PIT) and Social Security Contribution (SSC) gaps. This mission follows on from CD provided to the SRC to measure the Value Added Tax (VAT) and Corporate Income Tax (CIT) gaps.

Several productive workshops and meetings were held with Mr. Arsen Sarikyan, Head of Development and Administration Strategy Programs Department, (SRC) and his staff, representatives from the Ministry of Finance (MoF), the State Social Security Service (SSSS) (a unit of Ministry of Labor and Social Affairs) and the Armenian Statistical Committee (ARMSTAT). The report's findings are based on the data and information provided by the SRC.

The IMF team expresses its sincere appreciation to the SRC, MoF, ARMSTAT and the SSSS for the excellent cooperation, fruitful workshops and meetings. The team particularly acknowledges the excellent support provided both before and during this mission by Mr. Arsen Sarikyan, Head of Development and Administration Strategy Programs Department and his team. In addition, the mission team would like to acknowledge the excellent interpretation services provided Ms. Lilit Simonyan and Mr. Khachatur Adumyan.

This report represents the final version of the draft report that was submitted to Mr. Ashot H. Muradyan, Deputy Chairman and Mr. Arsen Sarikyan, Head of Development and Administration Strategy Programs Department, on September 10, 2024. It consists of an Executive Summary and the following sections: (I) Background (II) Findings; and (III) Next Steps.

Executive Summary

This mission reviewed data available to the State Revenue Committee (SRC) for estimating the Personal Income Tax (PIT) and Social Security Contribution (SSC) gaps. The mission team concluded that SRC has sufficient quality data available from operational audits to assess the PIT/SSC gaps.

There are two main methods for estimating tax gaps: top-down and bottom-up. Each has its strengths and weaknesses, making them useful together for a thorough analysis. Top-down gap estimates have already been conducted by SRC and the Ministry of Finance (MOF). These results were not reviewed by the mission team since this was outside the scope of the mission, instead the team focused on data availability for more granular gap assessment using the bottom-up approach. The bottom-up approach for measuring PIT and SSC gaps relies on detailed records from the SRC and operational audits of taxpayers.

The SRC's detailed tax registry data and background information on all taxpayers is very important for a tax gap model to produce reliable estimates. SRC also keeps records of audit results from comprehensive audits, thematic audits, and thematic inspections. Although the SRC monitors the risk scores used to select taxpayers for comprehensive audits, it does not track the criteria for selecting taxpayers for thematic audits and inspections which makes these types of audits unsuitable for the tax gaps estimations.

A bottom-up approach using data from operational audits will likely be particularly effective for estimating the PIT and SSC gaps. SRC's extensive data on audit results and taxpayer characteristics allows for more accurate estimates and will help identify specific reasons for non-compliance, such as common mistakes or sector-specific issues. By understanding these details, tax authorities can tailor their strategies to improve compliance among different taxpayer groups.

In the longer term, the SRC can undertake enhanced gap analysis comparing employment statistics from the Labor Force Survey (LFS) with its own data. Both the Statistical Committee - Republic of Armenia he Armenic Statistics Committed (ARMSTAT) and the SRC can analyze employment by sector using the "Nomenclature of Economic Activities" (NACE) code. If ARMSTAT data shows higher employment in certain sectors than the SRC data, it may indicate underreporting.

Next Steps

Given the robust data available in SRC, the IMF can assist the SRC to estimate the PIT/SSC gap for the income years 2020 to 2022. To undertake this the SRC will need to make the data available to IMF. This assistance could be provided remotely in November 2024 or, if more time is required, in February 2025.

Recommendations

PIT and SSC Gap		
1	The SRC have the data available by November 1, 2024 in order for IMF to be able to help in measuring the PIT/SSC gaps.	November 1, 2024
2	The PIT/SSC gap be estimated using the bottom-up method based on comprehensive audits conducted by the SRC.	December 30, 2024
3	The SRC uses the labor input method and compares employment statistics from the LFS with SRC employment statistics.	June 30, 2025

I. Background

A. SRC's Primary Focus

1. The Chairman of the Armenian State Revenue Committee (SRC) asked for IMF assistance to measure the Personal Income Tax (PIT) and Social Security Contributions (SSC) gaps.[1] [2] This request was confirmed at the 2024 Spring Meeting. This mission is the first step in assuring that the PIT and SSC gaps can be measured. The purpose of the mission is to get a detailed understanding of data availability so that an estimation of the PIT and SSC Gap can be made.[3] If suitable data is available, follow-up assistance can be provided upon request to help calculate the PIT and SSC gaps.

2. The Armenian Personal Income Tax (PIT) and Social Security Contribution (SSC) systems operate within a framework that includes a well-established withholding tax system. This also includes an employee register, and the mandatory electronic submission of withholding returns.[4]

3. PIT and SSC are collected by SRC at the same time. SRC is responsible for ensuring the correct withholding of PIT and SSC from employers.

B. Past Tax Gap Capacity Development

4. Previous capacity development (CD) was provided to SRC to measure the Value Added Tax (VAT) gap in 2022 and Corporate Income Tax (CIT) gap in 2024. The VAT gap was measured using the IMF's Revenue Administration VAT gap model and the CIT gap was measured by a bottom-up approach based on operational audits. In addition to measuring the CIT gap a machine learning model (MLM) was developed to select cases for future audits. Following the CIT gap estimation and the MLM to select cases for future audits a CD report with prediction of the CIT gap for 2023 based on non-audited corporate income tax declarations was also delivered.[5]

5. In 2022 the VAT compliance gap was estimated to be 0.8 percent of GDP and 8.9 percent of potential VAT on average for 2019 and 2020.[6] Normally the compliance VAT gap is estimated for a five-year time period by IMF's Revenue Administration VAT gap model. However**,** this was not possible

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[1] Employers are required to withhold both personal income tax (PIT) and social security contributions. This encompasses various forms of income such as salaries, benefits, bonuses, temporary disability compensation, and maternity leave compensation. As of 2024, the rate of the personal income tax in Armenia is 20% and applies to all forms of compensation, regardless of the amount involved.

[2] Apart from PIT, employers are also responsible for deducting social security payments. As at 2024 the rate for these payments stands at 5% for income up to 500,000 AMD (approximately $1,309) and 10% deducted 25,000 AMD for income exceeding this threshold. It's important to be aware that there's a maximum salary limit for social security payments, currently capped at 1,125,000 AMD per month (equivalent to 15 times the minimum monthly wage of 75,000 AMD).

[3] Interest, dividends and royalties are subject to a final withholding tax and are treated separately to PIT and SSC and therefore are out of scope for this work.

[4] IMF. Technical Notes and Manuals, *Republic of Armenia: Technical Assistance Report on Personal Income Tax: Policy Review and Introduction of a Universal Declaration*. January 2023.

[5] Pedersen, S., Christiansen, T., *Republic of Armenia, Corporate Income Tax Gap Prediction 2023.* IMF. Technical Assistance Report. July 2024.

[6] Pisani, S.; Knudsen, M.; Thackray, M. and Zhong, S.: "*Armenia. Revenue Administration Gap Analysis Program – The Value-Added Tax Gap".* IMF. Technical Assistance Report. May 2022.

due to significant changes in the accounting systems used by the SRC. Therefore, to provide the most reliable VAT Gap figures, it was decided to limit the calculation to the years 2019 and 2020.

6.   The Armenia CIT compliance gap was estimated as a three-year average at 35.2 percent of potential CIT liability for the income years 2020, 2021, and 2022.[7] Excluding audit adjustments with no immediate impact on revenue (due to tax losses before and after audit) the CIT gap was estimated at 26.4 percent of potential CIT liability.[8] Measured in terms of GDP the CIT gap was 1.4 percent or 1 percent excluding audit adjustments with no immediate impact on revenue.

7.   The MLM predicted that auditing the top 10 percent of corporations with the highest risk is likely to raise revenue by three times compared to the SRC's existing risk model. [9] The MLM also results in higher average CIT corrections compared to the current SRC strategy when auditing taxpayers other than those in the top 10 percent.

8.   The SRC also asked for a prediction of the CIT gap for 2023 based on non-audited CIT returns. In a later CD delivered in July 2024 the CIT gap was predicted to be 34.1 percent of potential CIT liability for the income year 2023 based on non-audited CIT returns. Excluding audit adjustments with no immediate impact on revenue (due to tax losses before and after audit) the CIT gap was predicted to be 25.5 percent of potential CIT liability in 2023.

C. Past PIT Gap Assessments

9.   The SRC and MoF have made their own calculations of the PIT gap based on a top-down approach. During the mission the SRC shared the results of PIT gap estimates made by SRC and MoF respectively.

10.   The SRC and MoF have both measured the PIT gap based on discrepancies between national accounts statistics and SRC data.[10] Wages and salaries are derived from output and value added in national accounts. Potential tax to be withhold from employers is then calculated from the estimated wages and salaries. The PIT gap is calculated as the difference between potential tax derived from national accounts and reported taxes to the SRC.

11.   The SRC estimates the PIT gap at 0.94 percent of GDP in 2022 whereas the MoF estimates it at 1.35 percent of GDP in 2022. For 2020 and 2021 SRC estimates the PIT gap at 0.67 percent and 1.09 percent of GDP and MoF estimates the PIT gap at 1.05 and 1.13 in 2020 and 2021 respectively. As can be seen MoF estimates are slightly higher compared to SRC's estimates in all three years.

12.   The main reason for the difference in estimates of the PIT gap between the SRC and MoF is that SRC makes the calculation at sectoral level whereas MoF makes it on aggregated data. According to the SRC their more granular estimates gives a more precise estimate of the PIT gap since the estimation at a sectoral level can take different legislative rules in different sectors into account.

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[7] Pedersen, S. and Christiansen, T. G.: "*Armenia. CIT Gap Estimation Based on Operational Audits*". IMF. Technical Assistance Report. May 2024. This analysis measures the CIT compliance gap, i.e., the policy gap is excluded. For simplicity, "gap" and "compliance gap" will be used indistinguishably in this report.

[8] The estimates do not account for undetected noncompliance which could lead to underestimation of the CIT gap.

[9] Auditing ten percent of all companies is well beyond SRC's current resources used on CIT audits.

[10] See also below in "II Key Issues" for a description of the method.

II. Findings

A. PIT Gap Measurement Methodologies

13.   There are two approaches to estimating tax gaps: top-down and bottom-up. Each approach has its own strengths and limitations, making them complementary tools for comprehensive tax gap analysis.

14.   Top-down approaches use independent statistical data, typically from national accounts, to model a potential tax base. This potential tax base is then compared to the actual tax base as observed in the tax administration. These approaches allow for tax gap estimates that capture the overall size of non-compliance in all its forms, including informal activities, but typically lacks the ability to provide granular insights into compliance levels across different taxpayer types.

15.   Techniques based on a bottom-up approach focus on using the tax administration's detailed taxpayer records to estimate the size of the tax gap. Such detailed records include results from random audits, operational audits targeted by risk criteria, and other interventions by tax authorities. These techniques allow for a direct and detailed assessment of the tax gap and a breakdown of the gap for different segments of taxpayers, but they typically miss noncompliance that is undetectable, even with the best efforts in auditing.

Operational audits (bottom-up approach)

16.   Using operational audits to measure the PIT gap needs to account for the non-random selection of audited taxpayers. Failure to correct for this non-random selection may result in an inaccurate estimate of the PIT gap. This bias, known as "Sample Selection Bias," arises from the non-random selection of cases. The Heckman method, devised by economist (and Nobel laureate) James J. Heckman, is utilized to correct for Sample Selection Bias.[11]

17.   The Heckman method is a two-stage procedure. In the first stage, it estimates the probability that a taxpayer is selected for audit. This is done using a probit model and risk scores to select tax audits of tax agents and other types of taxpayers that withhold PIT/SSC. The second stage models the PIT/SSC uncovered from audit using taxpayer characteristics (lines from the tax return, sector, number of employees etc.) and a regressor that accounts for the selection process derived from the first stage. Once the model has been fitted, the tax gap can be split into subcomponents based on information on taxpayers to obtain granular insights.

18.   The Heckman two-step estimator's suitability depends on how audits are conducted. If audits focus narrowly on specific parts of a business, they may miss undisclosed taxes, leading to an underestimated tax gap. Most audits by the SRC are comprehensive, which helps to minimize the risk of missing such tax discrepancies. Additionally, if audits target specific companies, such as a particular sector or type of firm, it becomes challenging to obtain a reliable estimate of the tax gap. This difficulty arises from the increased extrapolation required between audited companies and the rest of the

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[11] James J. Heckman (1979). "Sample Selection Bias as a Specification Error". Econometrica. vol. 47(1), pp. 153-161.

population. Finally, precautions must be taken since a fraction of noncompliance could be undetectable, even under the best efforts of auditing. This possibility could result in an underestimation of the tax gap.[12]

Consumption survey method (top-down approach)

19.   Information from household consumption expenditure surveys can be used to estimate the amount of underreporting among self-employed taxpayers. By comparing the relationship between food expenditure and income for self-employed individuals and employees, it is possible to infer underreporting. This methodology was developed by Pissarides and Weber (1989).[13]

20.   Assuming workers report income accurately due to third-party reporting and tax withholding, we can estimate the fraction of income spent on consumption. If we assume the proportion of income spend on food expenditure is identical across taxpayers, then for a given level of reported income (and other household characteristics, for example, age, number of children, etc.), we can calculate the food expenditure of the self-employed. If this expenditure is higher than that of employees, it is interpreted as under-reporting of income. The method is illustrated in figure 1.

Figure 1. Consumption Survey Method
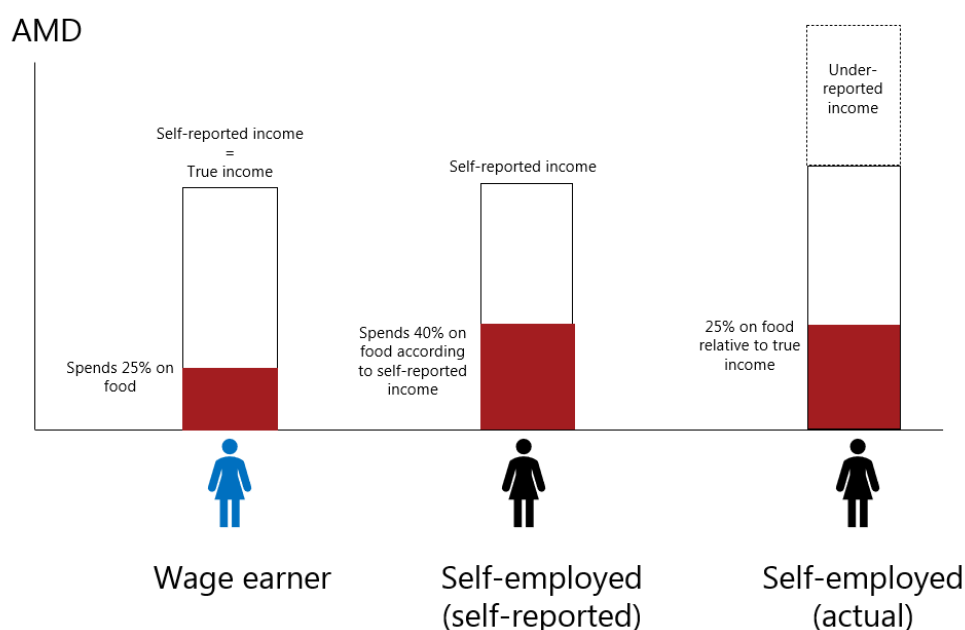
Source: IMF

21.   The method captures most aspects of informal economy activities. Since the method is based on surveys covering registered, non-filers, and non-registered taxpayers it covers most informal activities.[14] However, the method does not provide information or granularity on what drives non-compliance, and it relies on stronger assumptions compared to audit-based approaches. Moreover,

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[12] In this approach we will not include uplifts factors or any other additional adjustments for estimating non-detection effects.

[13] Christopher Pissarides and Guglielmo Weber (1989). "An expenditure-based estimate of Britain's black economy". Journal of Public Economics vol. 39(1), pp. 17-32.

[14] Unless a sample for the household budget survey is drawn from registers of the population like in the Scandinavian countries.

questionnaire surveys like consumption expenditure surveys are distorted by non-response and measurement error.

Labor-input method (enhanced approach)

22.   The labor-input method compares employment from labor force surveys (LFS) with registered employment.[15] Assuming labor force surveys cover all employment, declared or not, the difference in reported hours in the survey, and in the tax registry can be interpreted as underdeclared hours.

23.   To estimate the tax gap, the calculated differences in the number of full-time equivalents are multiplied by the per capita values of output and value added. The method measures the prevalence and value of underreported hours worked. Both the LFS by ARMSTAT and SRC record employment and hours worked by sector which makes it possible to break down the uncovered employment by industry sectors.

24.   Questionnaire surveys like LFS can be distorted by non-response and measurement errors. If respondents differ systematically from non-respondents or misreport hours worked, the PIT/SSC gap estimate will be inaccurate.

Conclusion of PIT Gap Measurement Methodologies

25.   SRC can estimate the PIT/SSC gaps using a bottom-up approach based on operational audits initially followed by the labor input method. Although the IMF did not review the SRC's and MoF's top-down estimates of the PIT gap, it is recommended to use the bottom-up approach to measure the PIT/SSC gaps. This method provides a direct and detailed assessment of the tax gap and allows for a breakdown of the gap across different segments of taxpayers. After the initial tax gap estimates using the bottom-up method is completed, the estimated gap results can be further enhanced by applying the labor input method.

B.   Data Available for PIT Gap Measurement

Audit Data

26.   The SRC prepares and implements an annual audit program that includes comprehensive audits, thematic audits, and thematic inspections. The annual program targets taxpayers assessed as representing the highest risk to revenue by the SRC's internally developed risk assessment system. For comprehensive audits, this consists of risk scores, and for thematic audits, it consists of several binary criteria. The SRC also conducts thematic inspections. Thematic inspections were introduced in 2022 and consist of desk-type audits selected on the same criteria as thematic audits.

27.   The SRC conducts around 1,000 comprehensive audits each year. Comprehensive audits cover all aspects of the taxpayer including PIT. Moreover, taxpayers selected for audit each year will have their unaudited tax returns audited for up to three years earlier. The total assessed PIT from

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[15] This method, first applied by ISTAT in 1987, uncovered an informal economy of 18% of GDP, leading to an upward adjustment of Italy's GDP. [15] Cf. Dalgaard, E. (1998), "The black economy in EU countries" in Pedersen S. (1998), "*The Shadow Economy in Western Europe Measurement and Results for Selected Countries*".

comprehensive audits and thematic inspections in 2020, 2021, and 2022 amounts to 1 billion AMD, 1.3 billion AMD, and 900 million AMD, respectively. The total assessed SSC amounts to 6 million AMD, 21 million AMD, and 12 million AMD, respectively. Most of the assessed PIT and SSC relate to audits where taxpayers agreed to the findings and adjusted their tax returns accordingly.

28.   In addition to comprehensive audits, the SRC also conducted thematic audits in 2020-2022. Thematic audits are unannounced audits that aim to uncover unregistered workers. No PIT adjustments are reported during thematic audits, but penalties of 250,000 AMD for each unregistered worker are imposed. The associated penalties from thematic audits covering income years 2020-2022 amount to a total of 1.4 billion AMD. The number of thematic audits ranged from 700-1,300 between 2020-2022.

29.   Tax registry data, including audit outcomes and risk scores, are available.
The SRC collects and stores comprehensive tax registry data and background information on all taxpayers. It also maintains records of audit results from comprehensive audits, thematic audits, and thematic inspections. While the SRC tracks the risk scores used to select taxpayers for comprehensive audits, it does not track the criteria for selecting taxpayers for thematic audits and thematic inspections, as these criteria change regularly. The data facilitates the estimation of the PIT/SSC gap based on comprehensive audits, with thematic audits/inspections serving as a supplementary measure.

Survey Data

30.   The LFS carried out by ARMSTAT follows recommendations from the International Labor Organization (ILO) on how to collect LFS data. According to ARMSTAT they have data from 7.788 completed interviews among households from 2020 and onwards.[16] This is about 1 percent of the total population of households in Armenia. The LFS contains information of approximately 23,000 individuals' labor force participation. Anonymized data is publicly available.

31.   The LFS contains information about employment at a sectoral level. It is possible to estimate employment at a sectoral level using NACE codes with reasonable degree of certainty with information on 23,000 individuals.

32.   In addition to the LFS, the SRC records the number of employees and hours worked in PIT returns. This data facilitates the comparison between tax registry records and LFS data, and thereby the estimation of the PIT/SSC gap.

33.   The Household Integrated Living Conditions Survey (HILC) conducted by ARMSTAT covers 5,184 households from 2020 onward. The survey is carried out monthly throughout the year, covering different households each month. It reports monthly food expenditures and income, broken down by sources such as salary and self-employment, as well as several household characteristics, including the number of household members, children, age, gender, educational level, etc. The HILC survey contains information about approximately 17,500 household members. Anonymized data is publicly available.

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[16] Source: ARMSTAT, https://www.armstat.am/file/article/lab_market_2023_04.2.pdf

34.   According to Armenian tax legislation, most self-employed taxpayers, including sole proprietors, are subject to corporate income tax (CIT). As a result, the methodology developed by Pissarides and Weber (1989) building on Household Consumption survey data is not suitable for estimating the PIT/SSC gap.

Conclusion on data availability

35.   In conclusion, there is sufficient quality data available from operational audits to assess the PIT/SSC gaps. Additionally, there is ample data to also implement the labor input method.

C.   PIT GAP Methodology to be Applied.

36.   Data from operational audits are well-suited for estimating the PIT/SSC gap because of the SRC's extensive data on audit outcomes, audit selection, and taxpayer characteristics. This provides a solid foundation for accurate PIT gap estimates through methodologies that account for audit selection bias, such as the Heckman two-step estimator.

37.   An advantage of using operational audits to estimate the PIT/SSC gap is their ability to provide granular gap estimates for different segments of taxpayers. By breaking down the tax gap, it is possible to identify different causes of non-compliance, such as types of mistakes, demographic breakdowns, and sector-specific issues. This granular insight enables tax authorities to tailor interventions more effectively, addressing the unique challenges faced by different taxpayer segments and improving overall compliance.

38.   Based on the mission's findings it is recommended that the PIT/SSC gap be estimated based on comprehensive audits conducted by the SRC. Yearly data on roughly 1,000 comprehensive audits should serve as the primary tool for estimating the PIT gap, as data on audit results, taxpayer characteristics, and audit selection criteria (risk scores) are available. The PIT/SSC gap estimation should be conducted using the Heckman two-step estimator to correct for selection bias. This approach ensures that the estimated tax gap accurately reflects the compliance level of the population.

39.   In addition to comprehensive audits, data on thematic audits could be utilized to estimate the PIT/SSC gap due to unregistered workers. However, since thematic audits do not record under-reported PIT/SSC and because the risk criteria used to select thematic audits are not available, this data should be used primarily as a supplementary measure.

Recommendation

▪   That the PIT/SSC gap be estimated using the bottom-up method based on comprehensive audits conducted by the SRC.

III.   Next Steps

A.   Application of the Methodology – Additional CD

40.   It is proposed that the IMF will assist the SRC to estimate the PIT/SSC gap for the income years 2020 to 2022 using the bottom-up method. In order to undertake this the SRC will need to have the data etc. available. The IMF is proposing that it can be done remotely in November 2024 or if more time is required February 2025.

Recommendation

- That the SRC have the data available by November 1, 2024 in order for IMF to be able to help in measuring the PIT/SSC gaps.

B.   Future Application of Labor Input Method

41.   It is recommended that SRC uses the labor input method and compares employment statistics from the LFS with employment statistics in SRC data to give greater certainty/coverage of the PIT/SSC gaps. Both ARMSTAT and SRC can as mentioned above measure employment at a sectoral level following NACE code, and it is thus possible for SRC to compare number of employees according to ARMSTAT with number of employees reported to SRC from employers. If there is higher employment in certain sectors according to ARMSTAT compared to SRC data, this is an indication of underreporting. The suggested deadline of June 2025 should give SRC enough time to gather data from ARMSTAT and compare with SRC's own data in the analysis.

42.   If the labor method indicates sectors with high underreporting not found in operational audits SRC should investigate these sectors in more detail. This might result in targeted audits in these sectors. After sufficient targeted audits are collected in these sectors the PIT gap should be measured again using the Heckman two-step estimator.

Recommendation
- That the SRC uses the labor input method and compares employment statistics from the LFS with employment statistics in SRC data.