# **Request for Proposal**

**Theme: Developing alternative methodologies of tax evasion identification**

**Background**

Effective tax collection is one of the main functions of the government. It enables the increase of public expenditures without tax hikes, ensures a homogenous competitive environment for businesses and forms clear expectations for investors. According to international organizations, Armenia still has vast potential of increasing tax-to-GDP ratio by implementing better tax policies and more efficient tax administration. A recent study by the IMF estimates Armenia’s shadow economy at 36% of GDP, which with the current tax-to-GDP ratio of 21%, is a considerable potential source of public revenue. During the last years, serious efforts have been exerted to improve tax administration and major part of these successful changes was made possible due to application of modern technologies, such as online filing of returns, online issuing of invoices, launching of risk management Monitoring Center, Big Data processing, prefilling of tax returns, online cashier machines, automated e-ledger, Tax Stamps online monitoring, and Tax-free VAT return system. A byproduct of the introduction of e-governance is the accumulation of big data on firms’ and individuals’ income and expenses. At this stage further improvements in tax administration and tax policy design can benefit from rigorous and scientific approach towards analysis of accumulated data. More specifically, the tax authorities currently implement a rule-based approach for identification and audit of fraudulent taxpayers. While the rule-based system is updated annually using expert knowledge, the tax authorities expect to benefit from data mining and artificial intelligence solutions addressing the tax evasion problem through the analysis of accumulated big data, which has proven international experience of cutting fiscal losses.

**Objective**

The objective of the research project is to develop alternative methodologies of tax evasion identification, using data on tax returns and advanced data analysis techniques. In collaboration with relevant units of the Tax Service, the research team will come up with a collection of testable algorithms for identifying profit tax evasion (tax base reductions, under-reporting of income, among others).

**The Research proposal scope and research team composition**

Current Request for Proposal (RfP) is targeting one-year funding for research. In case the project proposal exceeds one year duration, it should provide justification for longer research period, as well as outline the deliverables expected at later stage.

The research team members should have a balanced mix of previous experience in research and/or consulting in the fields of public finance, taxation policy or tax administration, as well as advanced knowledge of data analysis tools, such as machine learning, micro econometrics and microsimulations. The experience should be verified by a series of peer-reviewed scientific publications, on-going research papers, and previous consultancy assignments’ reports.

**Scope of Work**

**The research is expected to address the following questions:**

* **Exploratory research and benchmarking** – Descriptive analysis of the current [rule-based] system applied by tax authorities for the identification and audit of fraudulent taxpayers, measurement of the system accuracy using relevant evaluation metrics, study of the international best practice with respect to methods, models and measures in tax fraud detection.
* **Specification of modeling targets –** Provision of model assessment, evaluation and diagnostic approaches identified by the research team based on scientific grounds, international experience and local needs.
* **Identification of the appropriate techniques** **–** Development of the methodology for the detection of tax underreporting and tax evasion risks leveraging advanced econometric and machine learning techniques given the tax service anonymized data and country specifics.
* **Model selection** – Comparison of the winning model for tax evasion detection with the benchmarked [existing] approach and selection of the final methodology. Description of methodology by which the model is proposed to be tested in the real settings.
* **Proposed models’ implementation evaluation framework –** The research work should address the design and, if feasible, implementation of scientifically rigorous approach towards evaluation of proposed tax evasion models applied in practice. There should be clear methodology on how the tax authorities can implement and evaluate the proposed models, including the comparison with currently applied rule-based approaches.
* **Future research lines** – Identification and suggestion of the future modeling opportunities based on the tax authority needs and tax service data addressing the losses of fiscal policy.

**Deliverables**

The following deliverables are expected to be provided by the selected research team by the end of the funding period:

* Exhaustive assessment of current tax fraud detection system,
* Provision of the winning algorithm addressing the tax fraud detection problem,
* Implementation of proposed models for tax evasion and their evaluation
* Final report including the research findings and future research opportunities,
* Draft research paper.