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Illicit remittances as a component of illicit financial flows: a new estimation method and application in Kyrgyzstan

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Abstract

Illicit financial flows (IFFs) undermine development by diverting resources away from productive investment and public revenue systems. While most IFF estimation methods focus on trade misinvoicing and corporate tax evasion, the role of individuals, particularly through remittances, remains underexplored. This paper introduces the first applied estimation model for assessing the illicit component of personal remittance flows in Central Asia, using the Kyrgyz Republic as a case study. In migration-dependent economies, large remittance volumes may partially originate from informal or undeclared labor, which is often untaxed and transferred through informal channels. The proposed method compares migrant income and consumption data with reported remittance volumes, adjusting for the use of informal money transfer systems (IMTS).

Applied to Kyrgyzstan, where over 95% of remittances originate from the Russian Federation, the model covers the period of 2014 - 2023. Results show that approximately USD 11.8 billion



of total remittance inflows during this period may have been illicit in origin. These flows represent a persistent, large-scale IFF pattern, with inward flows for the source economy and outward flows for the host. The findings challenge the conventional view of remittances as purely beneficial, showing that what strengthens the source economy can undermine the sustainable development of the host economy, mainly when driven by informal labor and unregulated transfers, highlighting the need for coordinated policy measures to mitigate these risks. This method expands the existing IFF estimation toolkit by introducing a replicable framework that captures flows from individuals, not just firms or trade. It holds significant relevance for countries seeking to improve resource mobilization, tax transparency, and compliance with SDG target 16.4.1.

Keywords: Illicit financial flows (IFFs), remittances, labour migration, money transfers, informal money transfers, hawala

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1. Introduction

All countries of the world experience a significant impact from inward and outward illicit financial flows, which limit the availability of economic resources and enable the redistribution of wealth, thereby hindering efforts to achieve greater sustainability and raise living standards. The issue of illicit financial flows (IFFs) was raised in the international community with the adoption of the 2030 Agenda for Sustainable Development and the formulation of Goal 16.4.1. and its indicator [1]. The existing conceptual framework currently describes various aspects of IFFs, and tax and commercial IFFs are among them [2]. The conceptual framework defines an IFF as “financial flows that are illicit in origin, transfer or use, that reflect an exchange of value and that cross the country borders”, and the range of illicit character is defined to be from merely opportunistic to unlawful activities.

Alongside various methods of IFF estimation already proposed to measure IFF values, more are being developed to cover areas either not specified in the existing methodological guidelines or those with no measurement tools. One such area is the cross-border flows of financial resources from individuals that may have an illicit origin. In international statistics, flows of current transfers (including compensation of employees) are reported as personal remittances [3]. They feature a cross-border character, thus making them potential data to include in the estimation of IFFs if they were earned illicitly or are used for illicit purposes afterwards¹.

This study argues that personal remittances contain a significant illicit component, to varying degrees, across many countries. This notion is not new and has previously been explored in terms of the contribution to the shadow economy [4],[5]. Personal remittances have been identified as one of the factors contributing to the size of the informal economy in various regions, including Europe [6],[7], Asia [8], and Africa [9]. The illicit dimension of personal

¹ If these flows are transferred illicitly, they will not be captured by international or national statistics; however, an analytical allowance should be made for this possibility.

remittances has also been discussed [10], [11]; yet no prior study has attempted to quantify this component, an empirical gap that this paper seeks to address.

Our estimation method is based on the assumption that a certain proportion of personal remittances abroad has an illicit origin, specifically, how these financial resources are generated through undeclared or informal economic activity. The application shown in this paper pertains to the flows between Kyrgyzstan and the Russian Federation.

Risk assessment in Kyrgyzstan revealed the existence of IFF risk resulting from remittances from abroad, specifically from the Russian Federation, the country most preferred by Kyrgyzstan's migrant workers for temporary employment. Some 95% of remittances received by Kyrgyzstan come labor migrants in the Russian Federation, who transfer part of their income to their home jurisdiction, however mirror data on income in the host country is inconsistent with the volume of personal transfers, thus this part of transfers is assumed to have an illicit origin: most likely illegal or unreported employment or 'grey' wages².

The method relies on host countries' annual mirror data on the number of labor migrants from a particular country, the country of origin (country j), the declared wages of labor migrants from country of origin in the host country, the approximate annual expenditures of labor migrants in the host country, taxes paid by labor migrant in the host country (country i) and the volume of personal remittances from host country to the country of origin, an assumption of the proportion of remittances transferred via the illegal money transfer systems (IMTS)³.

2. Literature Review

Illicit financial flows (IFFs) are defined as cross-border movements of capital that are illicit in origin, transfer, or use [2]. They include proceeds of crime, tax evasion, trade misinvoicing, and corruption-related transactions, and represent a significant obstacle to sustainable development by draining public revenues and reducing the availability of domestic resources for investment in social services and infrastructure. The urgency of curbing IFFs has been acknowledged globally through the inclusion of SDG Target 16.4, which calls for the significant reduction of IFFs by 2030 [1]. Most empirical approaches to estimating IFFs have focused on trade-related activities, particularly under- and over-invoicing, as well as leakages from the balance of payments and capital flight through offshore wealth [12], [13]. However, these methods largely overlook or underrepresent the role of individuals and non-corporate actors in generating illicit flows, particularly through informal labor activity, unrecorded incomes, and unregulated money transfers. The literature still lacks a systematic, quantitative method for isolating and measuring the illicit component of personal remittance flows. This study aims to fill this critical gap by introducing a replicable methodology for estimating the potentially illicit component of labor migrant remittances.

While remittances are conventionally understood as a lifeline for many low-income countries, especially for household consumption and liquidity support, growing evidence suggests that they can also serve as conduits for illicit flows. The literature identifies two primary IFF risks in personal remittances: (1) the illicit origin of funds, typically linked to undeclared or informal

² Grey wages are employment income received by workers in excess of the officially reported wages; this is done by employers to reduce production costs via avoiding income and payroll taxation.

³ Informal money transfer systems (IMTS) are remittance systems that exist and operate outside of (or parallel to) conventional regulated banking and financial channels [14].

labor income; and (2) the illicit transfer of funds through informal money transfer systems (IMTS), which bypass formal banking channels. Buencamino & Gorbunov [14] were among the first to raise concerns about remittance flows routed through unregulated systems, such as *hawala*⁴, noting their vulnerability to abuse for money laundering, financing terrorism, or concealing income. In regions with large diasporas and limited regulatory oversight, these systems account for a significant share of personal transfers. For example, in Bangladesh, the South Asian variant of hawala, known as *hundi*, is widely used for cross-border remittances, with estimated volumes exceeding formal flows in some periods [15], [16], [17]. Empirical evidence from Bangladesh and other countries suggests that remittance inflows often diverge from reported incomes in host countries, raising concerns about informal employment, shadow wages, and underreporting of labor migrants' tax liabilities. Despite this, few measurement approaches exist to quantify the illicit component embedded in remittance flows - an important gap that this paper aims to address.

In Central Asia, IFFs are primarily associated with trade misinvoicing, corruption, and drug trafficking [18], [19]. However, emerging literature and stakeholder consultations have increasingly identified remittances as a high-risk channel for illicit financial flows. Kyrgyzstan is highly dependent on remittances, receiving inflows equivalent to 20-30% of GDP over the past two decades. Most of these funds originate from Russia, where an estimated one million Kyrgyz citizens are employed as labor migrants [20], [21]. However, significant discrepancies exist between migrant wage data in Russia and the reported volumes of remittances sent to Kyrgyzstan. Stakeholder consultations and national risk assessments in Kyrgyzstan have raised concerns that a large portion of migrant labor is either informal or illegal, resulting in income that is neither declared nor taxed in the host country, and often transferred via informal channels [22], [23].

Early studies [24], [25] have documented the widespread use of IMTS among Kyrgyz migrants, and recent analyses suggest that 10-15% of remittances utilize such channels. However, the actual figure may be higher. The use of hawala-type systems remains pervasive despite efforts to improve financial regulation. Kyrgyzstan's relatively liberal currency and financial regime facilitates fast and inexpensive transfers, but also increases the risk of IFFs, especially when combined with weak enforcement of labor documentation and tax collection in destination countries. The Risk Assessment conducted under the project "*Statistics and Data to Measure Illicit Financial Flows in Asia and the Pacific*" finds that over 55% of total remittance inflows between 2014 and 2020 - equivalent to \$9.5 billion - could not be reconciled with legal migrant income, suggesting a potentially illicit character in terms of source, routing, or use.

Kyrgyzstan's vulnerability to IFFs from remittances is further amplified by systemic issues, including a large informal economy (averaging 38% of GDP from 1991 - 2017), weak tax enforcement, and underdeveloped mechanisms for international cooperation on financial data exchange [26]. The literature emphasizes that, while trade misinvoicing remains the largest documented source of IFFs in Kyrgyzstan, illicit remittances are both quantitatively significant and institutionally under-addressed, warranting targeted methodological innovation.

⁴ Hawala is a type of informal money or value transfer service. The hawala system is comprised of a network of agents who manage fund transfer, provide currency exchange, safeguard funds, and provide monetary guarantees, among other services [2].

3. Methods

Based on a review of existing literature and expert opinions, illicit remittances refer to transfers made by citizens of country A working in country B, who send a portion of their income back to country A. The assumption is that a portion of the revenue is obtained illicitly, either through illegal employment, informal employment, or underreporting of income by employers to evade payroll tax.

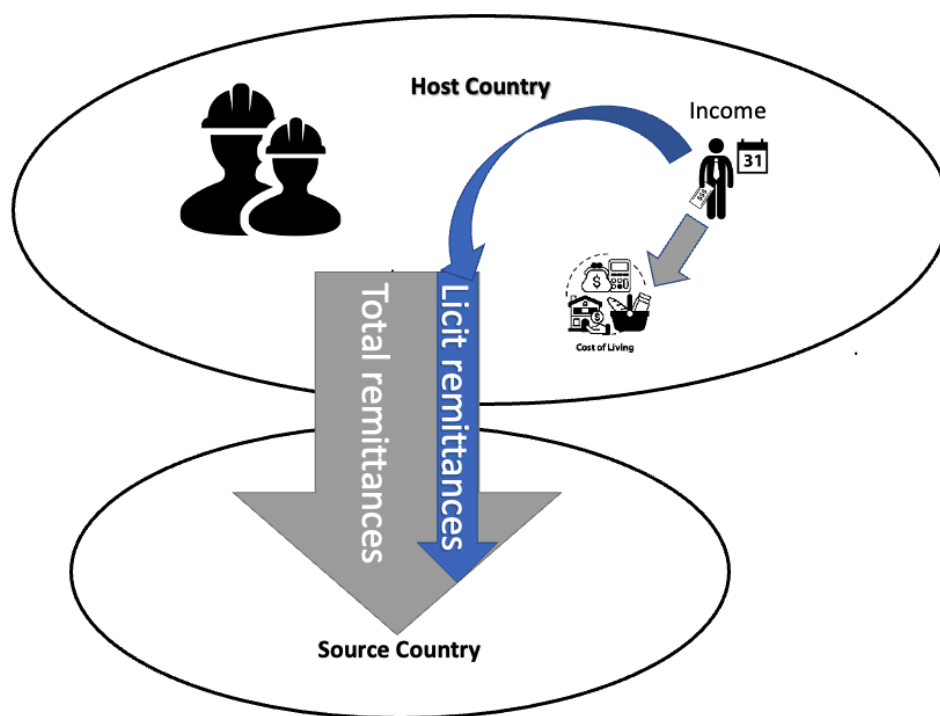


Figure 1. Illicit Remittances chart

The IFF from the income of individuals from abroad is proposed to be calculated in the following way:

$$\frac{REMIT_{tij}}{(1-IMTC)} - (INC_{tjj} - CON_{tjj}) = IFF_{tij} \quad (1)$$

,where

$REMIT_{tij}$ - volume of incoming money remittances of individuals from country i to country j in the period t

$IMTC$ - estimated share of transfers using illegal money transfer channels

INC_{tjj} - total income of labor migrants from country j in country i in the period t

IFF_{tij} - IFFs volume from illicit remittances to country j from country i in the period t

CON_{tjj} - volume of labor migrants' expenditures on consumption in country i in the period t

We suggest calculating the total amount of IFFs to country j from countries n as the sum of individual flows from different countries. The final value shows only the size of incoming IFFs:

$$IFF_{jt} = \sum IFF_{njt} \quad (2)$$

IFF_{jt} - total volume of incoming IFFs of country j in the period t

$\sum IFF_{njt}$ - sum of separate IFFs from countries n

In the case of Kyrgyzstan, the first application of this method was in one host country. Still, it is also the country from which 95% of personal remittances are transferred to Kyrgyzstan - the Russian Federation.

Estimation of the indicator INC_{tjj} ⁵ is based on average values obtained from immigration control services, tax authorities, or public surveys. The Federal Migration Service of Russia has information on the number of labor migrants from Kyrgyzstan who are legally working in Russia. The income of labor migrants is obtained from the NSO reporting on labor statistics, which provides the average wage. Data on remittances from labor migrants is available on the website of the National Bank of Kyrgyzstan.

There is some variation in the reported share of income spent in the host country. For example, Aleshkovsky et al. [27] estimate that migrant consumption in Russia accounts for approximately 60% of revenue, while Ryazantsev [28] suggests a slightly lower figure of 50%. Media sources and independent survey data also report values ranging from 45% to 60% [29], [30]. Government officials from Kyrgyzstan have stated that only about 30% of migrant income is remitted, implying that up to 70% is either spent or saved in the host country [31].

Given this convergence of estimates and the policy relevance of the upper-bound assumption, this study adopts a two-thirds (66%) expenditure assumption as a working baseline. This figure aligns with the international IFF methodology, ensures conservative risk estimation, and reflects the behavior of migrants who incur significant living costs (e.g., food, rent, permits) in the host country. However, for future refinement, we recommend a nationally representative expenditure-income survey for Kyrgyz migrant workers in Russia or using a confidence interval for estimation.

The proportion of IMTS is based on estimates from the Balance of Payments of the National Bank of Kyrgyzstan, which indicate that it was roughly 10% of total remittances before 2019 and 15.5% starting in 2019.

Based on the obtained information, we estimate the licit number of possible remittances and compare it with the factual value corrected for IMTS; the difference is assumed to be IFF.

⁵ An alternative method is based on obtaining statistics on the amount of personal income tax paid by labor migrants from country j in country i :

$$INC_{tjj} = \frac{TAX_{tjj}}{t} - CON_{tjj}, \quad (3)$$

, where

TAX_{tjj} - amount of personal income tax paid by labor migrants from country j in country i in the period t

t - personal income tax rate in country i

4. Results and Discussion

The analysis of remittance flows from the Russian Federation to Kyrgyzstan over the period 2014 - 2023 reveals a substantial and persistent volume of potentially illicit financial flows embedded within officially reported personal transfers. By applying the proposed estimation methodology - comparing annual migrant income and consumption to reported remittance inflows and adjusting for informal money transfer system (IMTS) usage, it is estimated that approximately USD 11.75 billion out of USD 23.49 billion in remittances during these 10 years may have had an illicit origin, representing 50% of total inflows. These represent inward IFFs for Kyrgyzstan and outward IFFs for Russia.

Table 1 provides a year-by-year breakdown of key indicators. Despite variability in labor migrant numbers and wages, particularly the spike in 2019 and the sharp fall in 2023, the volume of potentially illicit remittances remains consistently high. For instance, in 2014, with around 526,000 migrants earning an average annual income of USD 5,513.50, the estimated total income was USD 2.9 billion. After accounting for consumption and IMTS-adjusted transfers, illicit remittances were estimated at USD 1.42 billion, or 59% of total inflows.

Table 1. Estimation of Illicit Remittances, Kyrgyzstan, 2014 - 2023

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Number of labor migrants	526,000	540,000	622,000	630,000	640,000	1,055,000	720,000	884,133	978,216	650,000 ⁶
Average wages, annual, USD	5,513.5	4,655.2	5,421.2	6,000.0	6,008.9	6,857.1	6,968.3	6,771.6	7,028.5	4,348.5
Average annual expenditures on consumption, USD	3,675.7	3,103.4	3,614.1	4,000.0	4,005.9	4,571.4	4,645.5	4,514.4	4,685.7	2,899.0
Total annual income, million USD	2,900.1	2,513.8	3,372.0	3,780.0	3,845.7	7,234.2	5,017.2	5,987.0	6,875.4	2,826.5
Total annual expenditure, million USD	1,933.4	1,675.8	2,248.0	2,520.0	2,563.8	4,822.8	3,344.8	3,991.3	4,583.6	1,884.4
Potential illicit remittance	966.7	838.0	1,124.0	1,260.0	1,281.9	2,411.4	1,672.4	1,995.7	2,291.8	942.2

⁶ Estimated

es, million USD										
Reported remittances, million USD	2,167.9	1,622.3	1,938.5	2,435.1	2,638.4	2,358.5	2,324.8	2,690.8	2,780.2	2,531.5
IMTS estimated	216.8	162.2	193.9	243.5	263.8	365.6	360.3	417.1	430.9	392.4
Factual remittances	2,384.7	1,784.5	2,132.4	2,678.6	2,902.2	2,724.1	2,685.1	3,107.9	3,211.1	2,923.9
Potentially illicit remittances, million USD	1,418.0	946.6	1,008.3	1,418.6	1,620.3	312.7	1,012.7	1,112.3	919.3	1,981.7

The volume of potentially illicit remittances peaked in 2018 at USD 1.62 billion, then declined sharply in 2019 to USD 312.7 million, possibly due to improved reporting, reduced reliance on informal channels, or policy responses such as tighter labor enforcement in Russia. However, illicit flows rebounded after 2020, with another spike in 2023 to nearly USD 2 billion, despite a sharp reduction in reported migrant numbers, indicating a persistent mismatch between official labor data and actual remittance behavior.

Figure 2 illustrates the volatility of illicit remittances across this period, confirming the persistent nature of the problem, which remains largely unaffected by short-term political or economic cycles. Over the entire decade, the estimated illicit remittance volume of USD 11.75 billion significantly exceeded Kyrgyzstan's annual GDP in many years. For example, in 2020 alone, GDP was approximately USD 7.78 billion, meaning the cumulative IFF volume from remittances surpassed 179% of that year's output, pointing to critical risks for monetary policy, foreign exchange management, and fiscal planning.

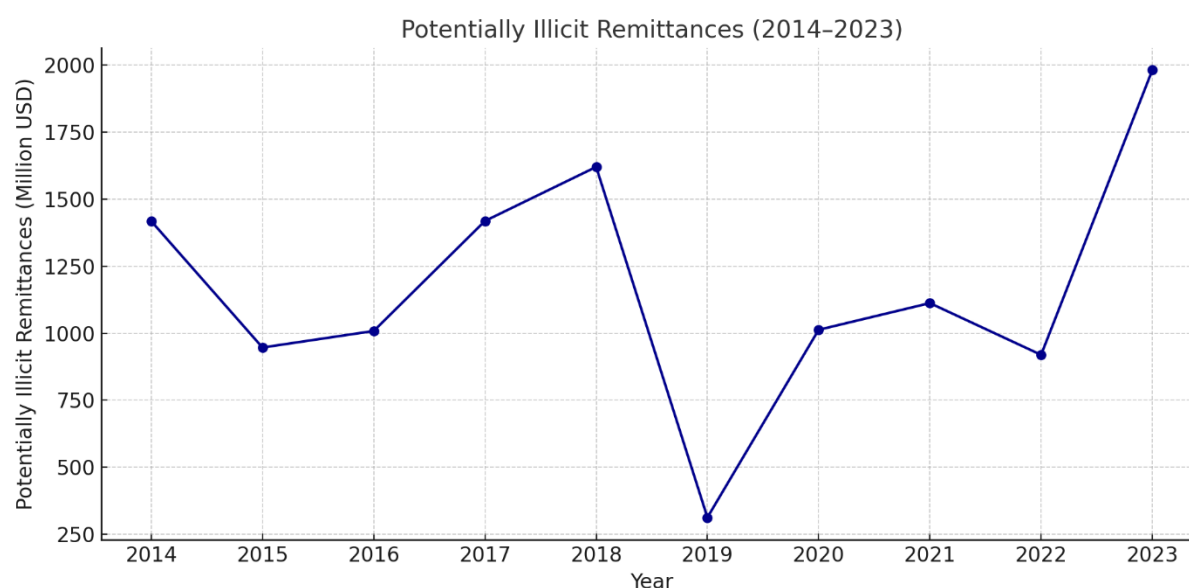


Figure 2. Potentially illicit remittances, Kyrgyzstan, 2014–2023

Moreover, these findings validate concerns expressed in the IFF risk assessments for Kyrgyzstan, conducted in the course of the projects “Statistics and Data for Measuring Illicit Financial Flows” and “Measuring and Curbing Illicit Financial Flows” over 2020–2026, where stakeholders highlighted labor migrant remittances as a top-priority IFF risk. The predominance of informal labor arrangements, undocumented wages, and underground money transfer practices all contribute to the systemic opacity of these flows. Outside of transparency considerations, large-scale remittances with potentially illicit components can have significant detrimental macroeconomic effects. These include exchange rate distortions due to unrecorded foreign currency inflows, inflationary pressures caused by remittance income-driven increased household demand, and weakened fiscal sustainability, as a substantial portion of income bypasses the formal economy and tax base, with remittances being largely untaxed in the home jurisdictions.

From a policy perspective, the results highlight the urgent need to:

- Strengthen bilateral data exchange between host and home countries on migrant wages and tax compliance;
- Improve tracking of informal transfer systems (e.g., hawala), including through regulatory incentives for formal channel usage;
- Enhance labor documentation mechanisms for Kyrgyz workers abroad;
- Build statistical capacity to estimate IFFs beyond trade, especially from individuals and households.

These findings not only fill a methodological gap in existing IFF estimation practices but also provide actionable insights for fiscal authorities, central banks, and development partners concerned with illicit capital flows, informal labor markets, and remittance governance in transition economies.

5. Conclusions

This study highlights the significance of remittance-related illicit financial flows (IFFs), introducing a replicable estimation method focused on individual-level income discrepancies. The application to Kyrgyzstan revealed that more than half of the reported remittances from the Russian Federation between 2014 and 2023, approximately USD 11.75 billion, may have originated from informal or undeclared labor income. These findings have profound implications for how remittance flows are viewed within both development and regulatory frameworks.

The results suggest that personal remittances, often regarded as development-enabling capital, can also conceal large-scale illicit flows when associated with unregulated labor or informal transfer systems. This complicates the narrative around remittances as a purely beneficial financial inflow. For countries like Kyrgyzstan, the presence of such a substantial illicit component undermines domestic tax collection, distorts the economic system, and presents challenges for international compliance, particularly regarding SDG 16.4.1. Moreover, the findings reveal gaps in labor governance and financial transparency between host and origin countries.

The methodology relies on several assumptions, including average wage levels, consumption shares, and estimated IMTS usage, which may vary across time and sub-populations. Data gaps in both host and origin countries, especially regarding informal labor and household spending, limit precision. Additionally, the method focuses on income discrepancies but does not capture illicit *uses* of remittances once received in the home jurisdiction.

It is recommended to extend the application of this method to other migration corridors to ensure data comparability and refine IFF estimates. Future research should build on this approach by utilizing micro-surveys, tax records, and behavioral financial data to enhance the reliability of the inputs. Expanding the framework to include outward remittance analysis from host countries and triangulating IMTS reliance through forensic evidence-based data could further improve robustness.

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Conflicts of Interest: The authors declare no conflict of interest.

Data Availability Statement: The study is based on publicly available secondary data. Figures on the number and wages of labour migrants were obtained from the Federal Migration Service of the Russian Federation and national labour statistics, while data on remittance volumes and the share of informal money transfers were drawn from the balance-of-payments and remittance statistics published by the National Bank of the Kyrgyz Republic. The dataset compiled and the estimates produced during this study are available from the corresponding author upon reasonable request.

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