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The Fiscal Impact of Brain Drain in Türkiye and a Compensatory Tax Mechanism: An Assessment of the Bhagwati Tax*

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ABSTRACT

Brain drain–the international migration of highly educated individuals–imposes not only demographic and social challenges but also significant economic consequences for developing countries. In particular, it results in substantial fiscal losses when publicly funded human capital is transferred abroad. This study estimates the fiscal burden of brain drain in Türkiye by calculating the public cost of university graduate emigration between 2015 and 2023. Using data from the Council of Higher Education, Turkish Statistical Institute, and education expenditure statistics, the analysis links emigration rates to per–student public spending. Results show that the number of emigrated graduates exceeded 146.000 during this period, leading to a cumulative public cost of over 4.6 billion Turkish Liras, which corresponds to approximately 511 million dollars. The study discusses these losses in the context of the Bhagwati Tax, a proposed compensatory tax on skilled emigrants. While the tax offers a normative framework, its implementation is limited by legal and political barriers. As an alternative, the study proposes a voluntary, earmarked diaspora fund, remittance-linked and return incentives, and institutionalised knowledge-and-innovation compacts with the diaspora. This research provides one of the first systematic estimates of the brain drain's fiscal cost in Türkiye and contributes to discussions on equitable responses to skilled migration.

***Keywords**: Brain Drain, Fiscal Cost, Bhagwati Tax, Skilled Migration*

***JEL Classification**: F22, H52, H24, O15*

Türkiye'deki Beyin Göçünün Kamu Maliyesine Etkisi ve Telafi Edici Vergi Uygulaması: Bhagwati Vergisi Üzerine Bir Değerlendirme

ÖZET

Beyin göçü yüksek öğretimli bireylerin uluslararası düzeyde göçü–gelişmekte olan ülkeler açısından yalnızca demografik ve sosyal değil aynı zamanda önemli ekonomik sonuçlar da doğurmaktadır. Özellikle, kamu kaynaklarıyla finanse edilen beşeri sermayenin yurt dışına transferi, ciddi mali kayıplara yol açmaktadır. Bu çalışma, Türkiye'de beyin göçünün kamu maliyesi üzerindeki yükünü, 2015–2023 yılları arasında üniversite mezunlarının yurt dışına göçü üzerinden hesaplamayı amaçlamaktadır. Yükseköğretim Kurulu, Türkiye İstatistik Kurumu ve eğitim harcamaları istatistiklerinden elde edilen veriler doğrultusunda, beyin göçü oranları kişi başına kamu eğitim harcamalarıyla ilişkilendirilerek mali kayıp tahmin edilmiştir. Sonuçlar, bu dönemde yurt dışına göç eden mezun sayısının 146.000'i aştığını ve bunun toplam kamuya maliyetinin 4.6 milyar Türk lirasını geçtiğini; bu tutarın yaklaşık 511 milyon ABD dolarına karşılık geldiğini ortaya koymaktadır. Çalışma, söz konusu kayıpları nitelikli göçmenlere yönelik önerilen telafi edici bir vergi mekanizması olan Bhagwati Vergisi çerçevesinde değerlendirmektedir. Bu verginin normatif bir yaklaşım sunduğu kabul edilse de yasal ve politik kısıtlar nedeniyle uygulanabilirliğinin sınırlı olduğu vurgulanmaktadır. Alternatif olarak, çalışma gönüllülük esaslı ve amaç tahsisli bir diaspora fonunu, havalelere bağlı ve geri dönüşü ödüllendirici teşvikleri ve diaspora ile bilgi ve inovasyona yönelik kurumsal mutabakatları önermektedir. Çalışma, Türkiye bağlamında beyin göçünün maliyetine dair ilk sistematik tahminlerden birini sunmaktadır.

***Anahtar Kelimeler:** Beyin Göçü, Mali Yük, Bhagwati Vergisi, Nitelikli Göç*

***JEL Kodları:** F22, H52, H24, O15*

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1. INTRODUCTION

In recent years, there has been a marked increase in the global migration of highly skilled labour. Rapid technological advancement, the flexibilisation of labour markets, and the ageing populations in high-income countries have significantly increased the demand for skilled professionals in developed economies. At the same time, young and educated individuals in developing countries increasingly seek career opportunities abroad, driven by expectations of higher wages, improved working conditions, and enhanced academic and professional prospects (OECD, 2023: 86). In this context, brain drain should not be viewed merely as an individual choice but rather as a manifestation of broader structural and systemic dynamics.

As of 2024, the global number of international migrants reached approximately 304 million, nearly double the 154 million recorded in 1990. However, migrants still constitute a relatively small portion of the world population, rising modestly from 2.9% in 1990 to 3.7% in 2024, as illustrated in Figure 1 (United Nations, 2025).

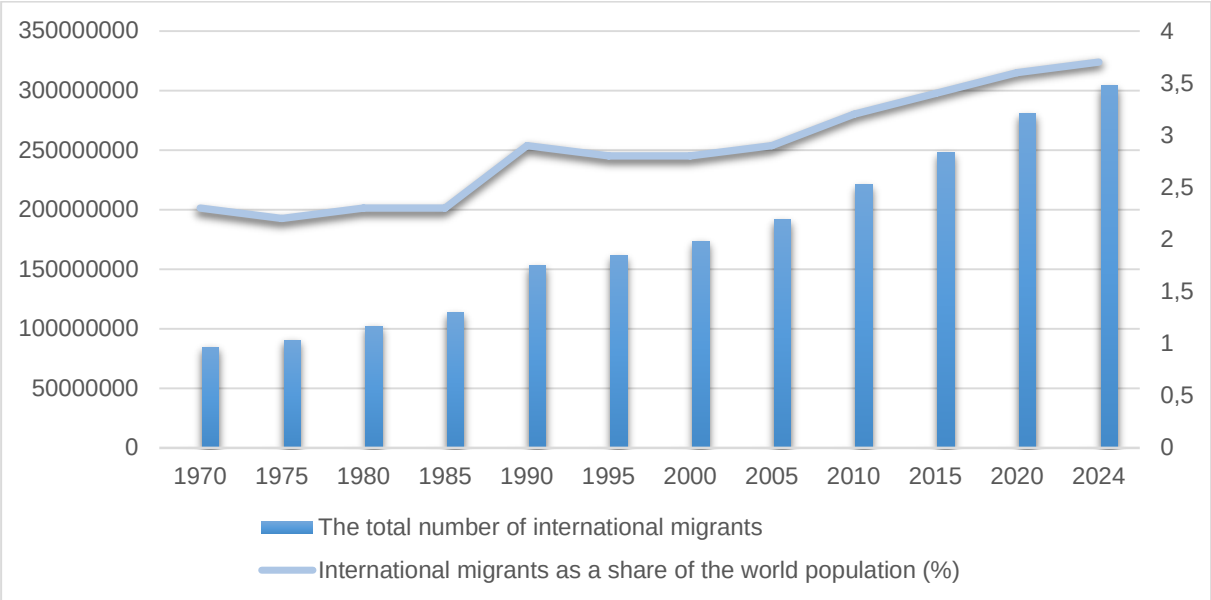

Figure 1: Number of international migrants worldwide and as a share of the global population (1990-2024) **Source:** (Data were obtained from the International Organization for Migration (IOM) and the United Nations; the figure was produced by the author).

Türkiye is not exempt from this global migration trend. Based on the OECD's International Migration Outlook 2024, Figure 2 ranks the top 20 countries of origin of new

immigrants to OECD countries in 2021–2022. India tops the list with over 550,000 migrants in 2022, followed by China, Russia, and Romania. Notably, Türkiye also features prominently, with emigration rising by 60% from 2021 to around 115,000 people, placing it among the leading countries of origin in recent OECD migration flows (OECD, 2024: 49–50).

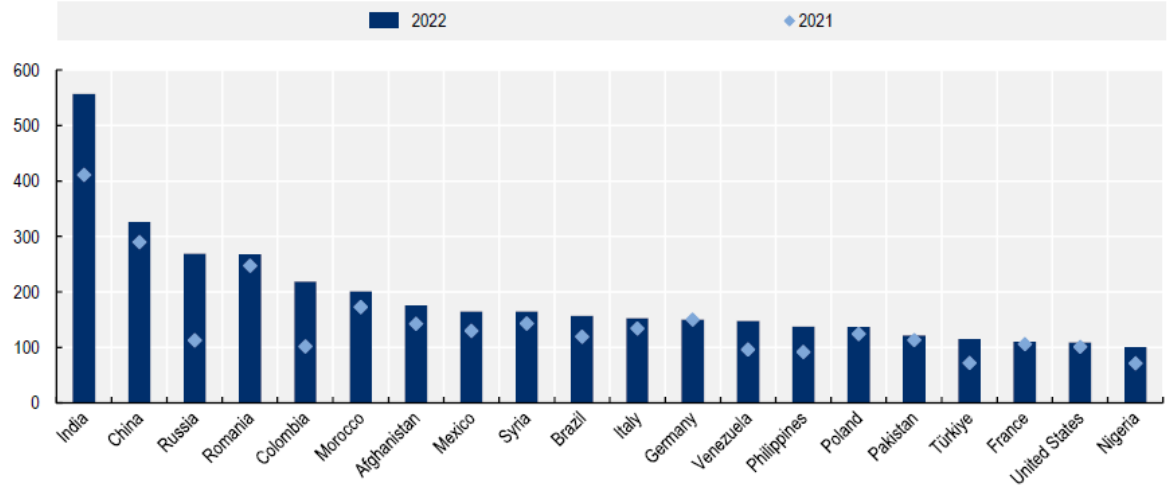

Figure 2: Top 20 countries of origin of new immigrants to the OECD
Source: (OECD, 2024: 50).

In the past decade, the emigration rate of university-educated young individuals from Türkiye has increased markedly. According to the Turkish Statistical Institute's report titled *Higher Education Brain Drain Statistics 2021–2023* (TurkStat, 2024a), the brain drain rate among higher education graduates increased from 1.6% in 2015 to 2.0% in 2023. As illustrated in Figure 3, the steady increase in the number of university graduates emigrating from Türkiye between 2015 and 2023 reflects an alarming trend. Recent data from TurkStat (2024) further reveal that this trend is particularly acute in STEM and life sciences fields. Among undergraduate programs, the highest emigration rates were recorded in molecular biology and genetics (17.9%), bioengineering (10.2%), management engineering (9.8%), electronics engineering (9.1%), mathematical engineering (8.9%), and computer engineering (8.4%). This pattern is further supported by Akçigit et al. (2023), who show that highly educated Turkish emigrants are predominantly concentrated in research-intensive scientific domains such as natural sciences, engineering, and health-related fields. This upward trajectory in skilled emigration signals growing challenges for national human capital retention and raises serious concerns regarding the long-term sustainability of public investment in education. This phenomenon has significant implications not only from a demographic and social perspective but also in terms of public finance and development

policy. The outward migration of individuals who have benefited from domestic education investments necessitates a reassessment of the efficiency and sustainability of public resource allocation. In terms of its broader impacts, brain drain contributes to the depletion of human capital stock in source countries and often leads to occupational distortions. Since highly skilled emigrants no longer contribute to domestic tax revenues, this results in direct fiscal losses (Docquier, 2014: 5–7).

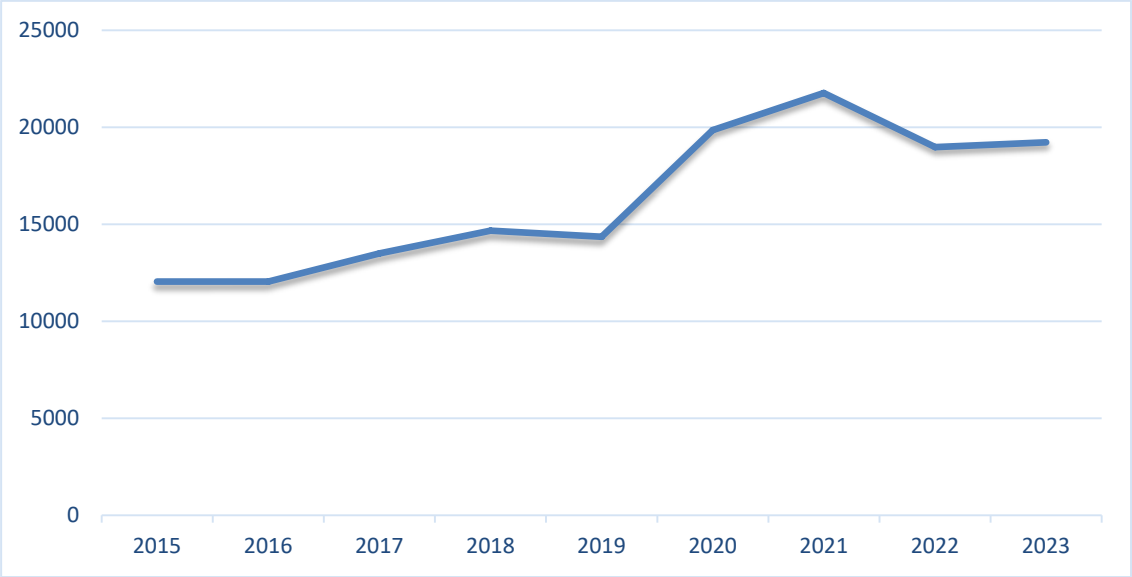

Figure 3: Number of Brain Drain (2015-2023)
Source: Created by the author.

Building on this context, the present study seeks to quantitatively estimate the fiscal cost of brain drain at the tertiary education level in Türkiye and to explore how such costs can be interpreted through the lens of compensatory taxation. Specifically, it asks: What is the magnitude of public financial losses associated with the emigration of university graduates, and how can these losses be understood within the theoretical framework of the Bhagwati Tax? To the best of our knowledge, this is the first data-driven study that systematically calculates the fiscal burden of brain drain in Türkiye, thus filling a critical gap in the national literature. By linking the number of emigrated graduates to per-student public expenditure figures over the 2015–2023 period, the analysis offers a novel quantitative perspective on the economic consequences of skilled migration. Furthermore, it provides a conceptual contribution by evaluating the relevance and limitations of the Bhagwati Tax as a potential

response mechanism. This dual focus–numerical estimation and normative evaluation–constitutes the core motivation of the research.

2. THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1. Overview of the Bhagwati Tax: Conceptual Foundations

The concept of a 'brain drain tax' was originally proposed by Jagdish Bhagwati in the early 1970s as a way to compensate less developed countries for the emigration of their highly skilled professionals to developed countries. Bhagwati first introduced the idea in an article published in the journal *Daedalus* (1972), later elaborated it with Dellalfar (1973), and formalized it in subsequent essays (Bhagwati, 1976).

At its core, the Bhagwati Tax entails levying a supplementary income tax on the earnings of skilled emigrants residing in developed countries. The revenue generated would then be transferred to the emigrants' countries of origin to mitigate the economic losses resulting from the outflow of human capital (Bhagwati, 1976: 34). This proposal is not merely an economic remedy but also carries moral reasoning. Bhagwati argues that emigrants who have benefited from public investment in education and infrastructure in their home countries have a moral obligation to contribute back once they gain economically abroad. The tax is envisioned as an internationally administered mechanism, preferably collected by host country tax authorities under the auspices of the United Nations and subsequently distributed to the origin countries. Such a structure would aim to ensure fairness, administrative efficiency, and prevent abuse by corrupt regimes by using a pooled international fund. One of the foundational theoretical justifications for the tax is that the emigration of skilled workers imposes both direct and indirect costs on less developed countries. These include the loss of social returns on public investments (particularly in sectors like health and education), disruption of internal human capital diffusion (such as rural doctor allocation), and inflationary pressures on domestic professional salaries due to international benchmarking (Bhagwati, 1976: 34–36; Bhagwati and Dellalfar, 1973: 94–97). Moreover, Bhagwati distinguishes his tax proposal from other coercive forms of migration regulation (like the

Soviet exit tax[1]) by grounding it in progressive taxation principles rather than punitive exit fees. The tax is to be applied only post–emigration and based on actual income earned abroad, thus avoiding moral concerns around freedom of movement (Bhagwati, 1976: 35).

In terms of practical application, the authors suggest a 10% flat tax rate on post-tax income, applied over a 10-year period following emigration (Bhagwati and Dellalfar, 1973: 96). This design balances equity with administrative feasibility and avoids strong incentives for immediate citizenship change that could undermine revenue collection. In sum, the Bhagwati Tax represents both a compensation mechanism for developing countries and a redistributive tool consistent with global justice arguments. Its theoretical foundation lies in the intersection of fiscal fairness, public investment recovery, and the governance of global labour mobility.

2.2. Academic Perspectives on the Bhagwati Tax: An Evolving Literature

Expanding upon this conceptual foundation, an increasing volume of scholarly work has examined the Bhagwati Tax from multiple disciplinary and methodological perspectives. Researchers have investigated its theoretical coherence, practical implementation challenges, normative rationale, and alternative policy models across both global and national contexts. The following section provides an integrated overview of these contributions, outlining the diverse viewpoints regarding the design, implications, and constraints of taxing skilled emigrants.

Several studies have supported the theoretical soundness and normative justification of the Bhagwati Tax, framing it as a morally legitimate and potentially effective tool for compensating sending countries for the fiscal losses caused by skilled emigration. Bhagwati and Hamada (1974) present a theoretical framework for taxing skilled emigrants as a second-best policy response to brain drain in developing countries. Their analysis integrates public finance and general equilibrium models to show that the emigration of educated individuals

[1] The term “Soviet exit tax” refers to the punitive fees imposed by the USSR (now the Russian Federation and other successor states) in the 1970s on individuals–particularly Jewish citizens–seeking to emigrate. These exit levies, often justified as compensation for state-provided education, were widely condemned as violations of the right to freedom of movement (Krasikov, 2007). Bhagwati explicitly distinguishes his tax proposal from such coercive practices by grounding it in progressive income taxation principles and applying it post-emigration and only on actual foreign earnings.

leads to fiscal losses and allocative inefficiencies in the home country. They argue that a tax on emigrant income, collected with international cooperation, can partially internalise the social costs of migration and restore equity. The study emphasises that such a policy is normatively justifiable even without assuming negative externalities. Wilson (2007) analyses the Bhagwati Tax using optimal income taxation theory in open economies, arguing that it helps source countries maintain progressive tax systems amid skilled emigration. He justifies the tax on equity and efficiency grounds, particularly when emigrants benefit from economic rents tied to immigration barriers. While acknowledging enforcement and coordination issues, he concludes the tax remains theoretically sound, even under imperfect government conditions. Brauner (2010) re-evaluates the Bhagwati Tax as a viable development financing instrument. He argues that, if aligned with modern tax principles and transparently administered, such a tax can be both morally justified and practically feasible. The study underscores the importance of linking tax revenues to measurable development outcomes in migrant-sending countries. Scalera (2012) analyses the Bhagwati Tax using a model with human capital externalities and strategic government behaviour. He argues that, when paired with optimal education subsidies, the tax can improve overall welfare and support human capital retention in high-emigration countries. Schiff (2018) revisits the Bhagwati Tax through a welfare–maximising model that accounts for education externalities. He argues that the tax remains optimal when paired with education subsidies, particularly in settings where policy gives priority to the welfare of non-migrating residents. Arıkan and İnneci (2023) examine European tax incentives for attracting skilled migrants, highlighting the effectiveness of flat-rate taxation and exemptions. They note Türkiye's limited approach and conclude that tax policy is key to managing brain drain.

Despite its normative appeal and conceptual coherence, a number of scholars have highlighted significant legal, administrative, and ethical challenges that limit the practical feasibility of implementing the Bhagwati Tax in real-world contexts. Docquier and Rapoport (2012) examine the fiscal impacts of skilled migration and assess the Bhagwati Tax as a compensation mechanism for source countries. While they recognise its potential to recover public education investments, they stress major obstacles such as enforcement, administrative coordination, and risks of double taxation. They conclude that despite its theoretical appeal, the tax faces serious implementation challenges. Sager (2014) critiques brain drain taxes like

the Bhagwati Tax on ethical grounds, arguing they unfairly target individual migrants. He advocates for an institutional approach, suggesting that solutions should focus on global and national structural injustices rather than restricting mobility. Shimada (2019) proposes education subsidies as an alternative to the Bhagwati Tax, arguing they can reduce brain drain by shaping study and work location choices. While the tax may act as a deterrent, subsidies offer positive incentives. The study finds subsidies more effective in developed countries, with mixed results in developing contexts. Gadzo (2019) analyses Croatia's brain drain and assesses tax policy responses. While the idea of taxing emigrants is discussed, the study finds such measures legally problematic in the EU context. Instead, the study recommends incentive-based tax regimes to attract skilled returnees as a more viable solution. Moreno and Lopez (2019) analyse brain drain taxes and brain gain incentives from a Spanish legal perspective. They argue that while the two may seem contradictory, they can be complementary if coordinated effectively. The study highlights that incentive-based tax regimes can help address legal challenges to taxing emigrants, particularly concerns over double taxation. Yavan (2022) examines the Bhagwati Tax as a policy tool to address skilled migration from developing countries. The study underscores its potential to recover public investment in education but notes that legal, administrative, and political obstacles significantly limit its feasibility, despite its theoretical and moral appeal.

Complementing these debates, recent contributions integrate normative and legal analyses with micro- and macro-level evidence to assess which fiscal and institutional arrangements can harness high-skilled emigration for development. Brauner (2010) reconceives a Bhagwati-style levy as a development instrument that is legally and administratively feasible within current international tax rules when tied to a "new development agenda" linking collection to measurable spending in origin countries. Comparing citizenship-based with home–host cooperative designs, he identifies familiar hurdles—goal clarity (compensation vs fairness/rent capture), enforceability and information exchange, and sovereignty/coordination costs—yet argues these can be managed with political will and largely within existing law. The core lesson is conditionality: legitimacy and effectiveness hinge on transparent, outcome-oriented earmarking and integration into broader capacity-building, not a stand-alone fix. Gibson and McKenzie (2012) find that high-skilled migration yields large net benefits for citizens of high-emigration countries, primarily

accruing to migrants through substantial earnings and added human capital; high-skilled individuals from poorer origins typically remit, while direct trade or FDI engagement is rare. Information diffusion that eases others' access to study/work abroad is common, but formal advisory roles to home governments or firms are uncommon. Return migration is widespread; returnees are more likely than non-migrants to facilitate knowledge transfer, though they do not exhibit systematically higher productivity. Fiscal costs vary with tax progressivity and public spending: per-migrant net effects are minimal in Tonga/Micronesia, about US$6,300 in Ghana, US$16,900 in Papua New Guinea, and range from −US$6,115 to +US$12,950 in New Zealand. On balance, measured benefits exceed measured costs, implying higher living standards for those born in high-emigration countries. Lister (2017) proposes a host-country tax-credit mechanism that leverages existing payroll/withholding systems: for selected migrants from least-developed origins whose tertiary education was publicly funded and who depart soon after graduation, the host tax authority would grant a credit equal to the home-country tax due on comparable income and remit it to the origin—thus avoiding double taxation while channeling funds back to capacity-constrained senders. Eligibility (public funding; departure within a fixed post-graduation window) and administration (filing questions, visa-record data, ordinary withholding/refund processes) rest on existing infrastructure, requiring no new supranational body. Not a "silver bullet" but normatively fairer than classic Bhagwati/exit-tax schemes, it is a practicable, development-linked fiscal transfer. Srivastava (2018) reviews brain drain—the emigration of highly trained workers—balancing modest gains (individual opportunity, global integration, knowledge flows) against broader losses for senders (slower development, technology gaps, weaker public services, talent shortages). Drawing mainly on descriptive evidence, especially India, he concludes that net effects for origin countries are generally negative. Policy recommendations prioritise talent retention and attraction via better career prospects, infrastructure, and research capacity, alongside clearer work-permit regimes and stronger domestic opportunities to anchor knowledge and investment at home. Kristiaji (2019) evaluates tax-based responses to brain drain in large developing economies—Bhagwati taxes, exit taxes, revenue sharing, and targeted incentives—against legal principles and enforceability. He finds no single optimal tool: revenue sharing is attractive in theory but institutionally onerous without supranational coordination; citizenship-based levies risk breaching non-discrimination norms; exit taxes raise rights concerns and distort mobility. Targeted tax incentives, bundled with non-tax

measures and R&D/training ecosystems, emerge as the most pragmatic lever. The study stresses international coordination, co-design with immigration authorities, and embedding fiscal tools within broader capacity-building: taxes are, at best, a limited yet defensible complement—especially given concurrent benefits (e.g., remittances) when crafted context-sensitively and multilaterally. Volacu and Terteleac (2021) reassess fairness in mitigating brain-drain harms by examining Brock's proposals extraterritorial taxation and temporary compulsory service. They argue Brock underestimates layered disadvantage, thereby overburdening skilled migrants; a just allocation should reflect comparative disadvantage and place a substantial share of financing on citizens of developed host countries. Thus, while limited taxation of skilled emigrants may be defensible, compulsory service fails on fairness and feasibility. Any effective tax would still hinge on host-country enforcement and international coordination. The upshot is burden-sharing: broaden the host-country tax base and prefer cooperative fiscal mechanisms over coercive service. Docquier and Veljanoska (2022) synthesise evidence showing that the net effects of high-skilled emigration hinge on the balance between losses (fiscal externalities, short-run skill gaps) and gains (education incentives, remittances, diaspora-driven brain circulation). They document strong positive selection and skill-biased mobility, with updated cross-country estimates indicating that where tertiary training scales and diaspora engagement are institutionalised, outcomes often tilt toward brain gain especially in many low-income and some middle-income settings. Policy implications include expanding higher-education capacity, easing regulatory bottlenecks, and establishing credible mechanisms to direct diaspora resources into human-capital formation and productive investment. Akcigit et al. (2023) contend that, with supportive policy, brain drain can yield scientific and economic gains rather than merely depleting human capital. They emphasise strengthening domestic research capacity and structured diaspora collaboration to foster brain circulation, whereby mobile talent contributes to both home and host through knowledge exchange. Under sustained human-capital investment and robust transnational networks, skilled emigration can generate long-run benefits for innovation, economic growth, and global scientific visibility. Bassetto and Ippedico (2023) evaluate Italy's 2010 Controesodo returnees scheme–under which only 25% of eligible returnees' labour income is taxed for several years–as a preferential regime to counter brain drain. Exploiting eligibility rules (college degree; born ≥1969) in administrative return-migration data and German social-security records, two–way difference-in-differences estimates

indicate that eligibility raises the probability of return by about 27 percent, with effects strongest among returnees from nearby EU destinations and evident across the wage distribution, especially below the median. Event-study profiles and a triple–difference (difference-in-difference–in–differences) specification that layers a Spain–Italy nationality comparison on top of the before–after and eligible–ineligible contrasts support a causal interpretation. A cost–benefit exercise suggests a marginally positive (roughly break-even) direct fiscal impact, and policy simulations underscore the importance of age targeting and carefully phased sunsets to sustain fiscal balance. Carare et al. (2024) develop a unified framework for Latin America and the Caribbean and, using a panel of 31 economies (1999–2019) with a shift–share IV, estimate that emigration lowers annual real GDP growth by about 0.28 percentage points, while remittances raise it by about 0.19 percentage points, implying a net−0.09 percentage point effect. Losses are largest in the Caribbean; labour-force participation falls modestly on average but about twice as much for youth (15–24). Extensive robustness checks support these results. Policywise, migration and remittances should be treated as interdependent channels: strengthen financial systems and institutions and steer remittances toward productive investment to offset productivity costs from high emigration. Batista et al. (2025) argue that, under supportive institutions and market conditions, high-skilled emigration can yield net gains for origin economies. Using causal evidence from policy shocks and quasi-experimental designs, they show that migration opportunities spur domestic skill formation (e.g., during the U.S. nursing visa expansion, one emigrating Filipino nurse corresponded to roughly nine new licenses at home), while remittances and diaspora networks finance human capital and diffuse knowledge, trade/FDI links, and pro–democratic norms. Although short-run sectoral shortages may arise, expanding training capacity, facilitating return migration, and deepening transnational ties can shift outcomes toward "brain gain," strengthening innovation and long-run growth where higher-education supply and the investment climate are responsive.

3. FISCAL COST ESTIMATION OF BRAIN DRAIN: THE CASE OF TÜRKİYE

This study aims to quantitatively estimate the fiscal burden of brain drain at the higher education level in Türkiye. The quantitative assessment is based on three primary data sources. First, the annual number of higher education graduates was obtained from the

'Higher Education Statistics' dataset published by the Council of Higher Education (YÖK) on its official platform. These figures represent the total number of individuals graduating from Turkish universities during the period from 2015 to 2023. Second, to estimate the proportion of graduates who emigrated abroad, data were drawn from the 'Higher Education Brain Drain Statistics' reports published by the Turkish Statistical Institute (TÜİK)[2]. These rates reflect the emigration tendencies among young university graduates. By integrating these rates with YÖK data, the number of emigrating graduates was estimated for each year. Third, the public spending per student in higher education was retrieved from TÜİK's 'Education Expenditure Statistics.[3] These values were assessed in both Turkish Lira (TL) and U.S. Dollar (USD), taking into account inflation-adjusted changes over time.

Finally, the annual number of emigrated graduates was multiplied by the corresponding per-student public expenditure to estimate the total fiscal cost for each year. This approach demonstrates that brain drain entails not only a loss of human capital but also a direct and measurable financial loss for the public budget. The time frame of 2015–2023 was chosen due to the availability of official data on brain drain rates exclusively for this period. Although data on graduate numbers and public education expenditures are available for earlier years, the absence of comparable emigration rate data limited the scope of this analysis to the aforementioned nine-year window.

Table 1: Estimated Fiscal Cost of Brain Drain in Türkiye, 2015–2023 (TL)

Year	The Number of Graduates	Brain Drain Rate %	Number of Emigrated Graduates	Public Spending per Student[4] (TL)	Growth Rate of Public Spending per Student (%)	Total Public Cost[5] (TL)
2015	752.593	1.6	12.041	12.463	-1.92	150.066.983
2016	753.480	1.6	12.055	13.487	8.21	162.585.785

[2] Turkstat (2024a). "Higher Education Brain Drain Statistics, 2021-2023", https://data.tuik.gov.tr/Bulten/Index?p=Higher-Education-Brain-Drain-Statistics-2021-2023-53839&dil=2 (03.05.2025).
[3] Turkstat (2024b). "Education Expenditure Statistics, 2023", https://data.tuik.gov.tr/Bulten/Index?p=Egitim-Harcamalari-Istatistikleri-2023-53557 (03.05.2025).
[4] Note: Per-student public spending refers exclusively to the tertiary (higher education) level.
[5] Note: "Total Public Cost" refers to the estimated fiscal burden on the public budget arising from the emigration of publicly educated university graduates.

2017	749.707	1.8	13.494	13.652	1.22	184.220.088
2018	771.460	1.9	14.657	16.248	19.01	238.146.936
2019	797.138	1.8	14.348	18.830	15.89	270.172.840
2020	1.044.321	1.9	19.842	20.777	10.33	412.257.234
2021	1.087.866	2.0	21.757	28.597	37.63	622.184.929
2022	903.673	2.1	18.977	50.236	75.66	953.328.572
2023	961.194	2.0	19.223	84.759	68.72	1.629.322.257

Source: Created by the author based on YÖK and TÜİK statistics.

Table 1 presents the estimated fiscal burden of brain drain in Türkiye over the period 2015–2023. The figures are based on the number of higher education graduates, emigration (brain drain) rates published by TÜİK, and public expenditure per student at the tertiary level. While the number of graduates and the brain drain rates fluctuated over time, the cumulative effect led to a considerable fiscal strain on the public budget. In the early years of the analysis, specifically 2015 and 2016, the number of emigrated graduates remained stable at approximately 12,000 per year, with a brain drain rate of 1.6%. The total fiscal loss during these years was around 150–160 million TL. However, per-student public spending began to rise, with an 8% increase observed in 2016. This upward trend continued modestly in 2017 (1%) and more sharply in 2018 (19%), contributing to an estimated fiscal loss of 238 million TL in that year. A notable surge occurred in 2020, when the number of graduates exceeded 1 million. Combined with a per-student spending increase of 10%, the fiscal loss due to emigration surpassed 412 million TL. The upward momentum became more pronounced in subsequent years. In 2021, the per-student cost rose by 38%, followed by a 76% spike in 2022 and a further 69% increase in 2023. These rapid increases in unit cost, despite relatively stable brain drain rates (ranging from 2.0% to 2.1%), significantly amplified the total fiscal burden. As a result, the public cost of brain drain reached 622 million TL in 2021, 953 million TL in 2022, and culminated in a record figure of approximately 1.63 billion TL in 2023. Compared to 2015, this represents more than a tenfold increase in public financial losses attributed to skilled emigration. In total, between 2015 and 2023, the cumulative fiscal loss is estimated at 4.62 billion TL, corresponding to the emigration of over 146,000 publicly educated university graduates. This trajectory clearly illustrates how rising public expenditure per student–particularly in recent years–has magnified the economic cost of brain drain, making it an increasingly critical concern for higher education and public finance policy in Türkiye.

This figure underscores the substantial public investment that is effectively externalised when highly educated individuals migrate abroad. From a public finance perspective, the fiscal cost of brain drain, beyond the economic and social externalities, constitutes a pressing challenge for higher education policy and labour market retention strategies in Türkiye.

Table 2: Estimated Fiscal Cost of Brain Drain in Türkiye, 2015–2023 (USD)

Year	The Number of Graduates	Brain Drain Rate %	Number of Emigrated Graduates	Public Spending per Student (USD)	Total Public Cost (USD)
2015	752.593	1.6	12.041	4.574	55.075.534
2016	753.480	1.6	12.055	4.456	53.717.080
2017	749.707	1.8	13.494	3.736	50.413.584
2018	771.460	1.9	14.657	3.370	49.394.090
2019	797.138	1.8	14.348	3.314	47.549.272
2020	1.044.321	1.9	19.842	2.961	58.752.162
2021	1.087.866	2.0	21.757	3.223	70.122.811
2022	903.673	2.1	18.977	3.027	57.443.379
2023	961.194	2.0	19.223	3.563	68.491.549

Source: Created by the author based on YÖK and TÜİK statistics.

Table 2 displays the estimated fiscal burden of brain drain on Türkiye's public finances over the period 2015–2023, expressed in U.S. dollars. While the number of higher education graduates who emigrated has already been presented in Table 1, this table focuses solely on the monetary dimension of this outflow, calculated using annual average public spending per student in USD. In the early years of the period (2015–2016), the fiscal loss due to the emigration of university graduates stood at approximately 55 million USD and 53.7 million USD, respectively. These losses declined slightly over the following years, reaching 50.4 million USD in 2017 and 49.4 million USD in 2018, mainly due to lower per–student public expenditure in dollar terms, despite rising emigration figures. From 2019 to 2021, public losses fluctuated between 47.5 million USD and 70.1 million USD, with the peak occurring in 2021. This increase reflected both the growing number of emigrants and a moderate rise in per-student spending in dollar terms. The fiscal burden eased slightly in 2022, falling to 57.4 million USD, before climbing again to 68.5 million USD in 2023. Notably, while the number

of emigrants remained relatively stable between 2022 and 2023, the rise in per-student cost (from 3,027 USD to 3,563 USD) accounts for the rebound in fiscal losses.

Over the nine-year span, the total cumulative fiscal cost of brain drain is estimated at 510.959.461 USD, emphasising that beyond its impact on human capital, international emigration of university graduates represents a direct and substantial financial leakage from publicly funded national resources. This underscores the need for a more strategic fiscal response to mitigate the long-term economic consequences of skilled emigration.

4. POLICY RECOMMENDATION: THE FEASIBILITY OF IMPLEMENTING THE BHAGWATI TAX

Although the Bhagwati Tax offers a compelling normative rationale for compensating source countries for skilled emigration, its practical implementation is fraught with legal, administrative, and political challenges. Collecting income taxes from non–resident emigrants may conflict with constitutional taxation principles and would require source countries to have extraterritorial tax enforcement capacity–something most developing nations lack (Stevenson, 2016). Such a tax also risks violating mobility rights and could be interpreted as a coercive policy rather than a fair compensation mechanism. Additionally, attributing fiscal loss solely to emigration overlooks the structural causes of underdevelopment and overestimates the causal link between skilled outflow and public sector decline (Dumitru, 2012; Clemens, 2014).

To address these limitations, scholars have proposed alternative models. One suggestion involves a tax credit system similar to the U.S. foreign tax credit model, which avoids double taxation and enhances administrative feasibility. Another option is taxing remittance recipients as a more viable proxy for emigrant taxation. Yet, even these alternatives face political hurdles and require extensive international cooperation, highlighting the difficulty of operationalising compensation frameworks on a scale (Stevenson, 2016; Lister, 2017).

In the context of these global implementation barriers, our quantitative findings for Türkiye between 2015 and 2023 underscore the real-world fiscal consequences of high-skilled emigration. Based on the number of university graduates who emigrated during this period

and the per-student public expenditure figures, the total public cost of brain drain is estimated at approximately 4.6 billion Turkish Lira (TL), which corresponds to nearly 511 million U.S. dollars (USD). This figure quantifies the scale of public investment lost through human capital flight and reflects the very challenge that the Bhagwati Tax seeks to address. Yet, as the literature suggests, recovering these costs through direct taxation mechanisms remains highly complex. Thus, the Turkish case not only illustrates the magnitude of fiscal losses caused by brain drain but also reinforces the need for more politically feasible, internationally coordinated, and ethically sound policy alternatives to restore public investment sustainability in developing countries.

This article advances three core policy proposals. First, it proposes a voluntary, earmarked Diaspora Solidarity Fund that converts diaspora attachment nostalgia, belonging, civic reciprocity into direct transfers to primary beneficiaries rather than the general budget. Funds would flow to accredited universities and research institutes (named scholarships, laboratory equipment, graduate training), public hospitals and health-professional training, and tightly targeted needs-based schemes, via ring-fenced sub-accounts that cannot be reallocated. The fund would be governed by an independent board (with non-voting governmental observers and representatives of major diaspora organisations) under clear conflict-of-interest rules, annual external audit, and quarterly public dashboards reporting inputs, outputs, and outcomes (e.g., scholarships awarded, publications and patents, trainees certified). To keep participation costs low, the fund will use existing payment channels—licensed remittance operators, card networks for one-off or recurring gifts, payroll giving via employers, and university alumni portals. All identity-verification and anti-money-laundering checks will be carried out by these providers under their standard regulatory obligations. Contributors could receive light, non-pecuniary recognition (public donor rolls, alumni distinctions, named scholarships or laboratories); where fiscally feasible, public bodies or universities could offer time-bound, capped matching (e.g., one-for-one for scholarships). Disbursements would follow simple, audited procedures with tight overhead caps, and monitoring and evaluation would track a small indicator set tied to the core aim of building human capital and research capacity.

Rather than taxing emigrants abroad- which is operationally fragile and normatively contestable given publicly funded education is a core state responsibility- the article proposes a two-pillar programme: (i) reward return; (ii) channel remittances into productive uses to mitigate, even if not fully offset, fiscal losses. Return pillar. Front-loaded but fiscally disciplined relief -Years 1–2: 75% of the personal income-tax base exempt; Year 3: 50%; Years 4–5: 25%; then sunset. Eligibility follows a dual track: early-career (publicly funded tertiary graduates who return within 7 years of graduation after 2–3 consecutive years of non-residency and 12–24 months of documented employment abroad) and expert (professionals with ≥5 years' experience in shortage occupations). Conditions include a minimum residence requirement in Türkiye, claw-back upon early re-emigration, and horizontal-equity safeguards via either an annual cap (e.g., 2–3× median wage) or a declining fixed tax-credit schedule. Remittance pillar. Provide tax credits, deductions, and matching grants only for transfers explicitly earmarked to tuition and training fees, donations to accredited research units, equity contributions to designated small and medium-sized enterprises (SMEs), or endowments of universities and public hospitals; ordinary consumption remittances remain untaxed. Where administratively useful, apply a very small surcharge–≤0.1%–only to large, investment-type transfers to finance oversight, with explicit exemptions for family support and humanitarian flows. In Türkiye, these measures complement (not replace) existing incentives in R&D and technology-development zones; the time-limited return relief is the distinctive addition.

Finally, the article recommends institutionalising knowledge-and-innovation compacts that operationalise brain circulation and convert diaspora expertise into verifiable academic and industrial spillovers through standardised, state-supported channels. On the academic side: fast-track recognition of credentials for health professionals and other regulated occupations; 6–24–month return fellowships with salary top–ups and small grants for laboratories and start-ups; and formalised co-supervised doctoral/medical tracks, tele-teaching, visiting professorships, and co-organised scientific meetings and schools with diaspora principal investigators. On the industry side: templated pathways for consultancy, collaborative R&D, and technology-transfer agreements with clear intellectual property (IP) and revenue–sharing terms; and time-bound co–investment windows in which diaspora gifts to laboratories or consortia are matched by public or university funds. Although these instruments require some public co-funding at the outset (procurement of expert services,

support for events, and matching grants), the expected long-run value added–greater innovation capacity, deeper supply–chain linkages, upgraded human capital, and commercialisable intellectual property–should plausibly exceed near-term tax losses, provided that outputs such as joint publications, patents and licensing income, start-up formation, and adoption of clinical or technical protocols are monitored and tied to continued support.

5. CONCLUSION

This study has investigated the fiscal implications of brain drain in Türkiye by systematically estimating the public cost associated with the emigration of university graduates between 2015 and 2023. The findings reveal a concerning upward trend in skilled emigration during this period, with the number of higher education graduates who emigrated between 2015 and 2023 exceeding 146,000. When this emigration trend is assessed in conjunction with data on per–student public expenditure, the total fiscal loss to the state is estimated to exceed 4,6 billion TL, which corresponds to roughly 511 million USD. These results underscore that the loss of human capital through international migration is not merely a social or demographic issue but also a direct and measurable burden on public budgets. In this sense, brain drain represents a dual loss: a depletion of talent and a forfeiture of substantial public investment made in the formation of that talent.

The rising fiscal cost of skilled emigration demands closer attention within public finance and education policy frameworks. In countries like Türkiye, where tertiary education is heavily subsidised by the state and youth unemployment remains elevated, the departure of highly educated individuals not only weakens the domestic labour force but also reduces the return on public spending. More critically, this trend threatens the long-term sustainability of national human capital development and exacerbates the inequalities between sending and receiving countries.

From a normative standpoint, the study contextualises these fiscal losses through the theoretical lens of the Bhagwati Tax. Originally proposed as a compensatory mechanism to redress the public investment losses incurred by developing countries, the Bhagwati Tax offers an ethically grounded and economically rational framework. However, as the literature and this paper jointly acknowledge, the practical implementation of such a tax faces

substantial obstacles, including legal constraints, international enforcement challenges, and political sensitivities. Therefore, while the Bhagwati Tax provides a useful conceptual foundation, it must be complemented by more feasible and cooperative mechanisms.

Given our estimates and the feasibility constraints documented in the literature, we advocate a three-pronged policy response for Türkiye and similar senders: first, establish a voluntary, earmarked Diaspora Solidarity Fund that channels contributions—via existing remittance and alumni/payment infrastructures—directly to universities, research institutes, public hospitals, and tightly targeted needs-based schemes under independent governance; second, implement remittance-linked and return incentives that keep ordinary consumption remittances untaxed but grant credits/matching for earmarked transfers (tuition, accredited R&D, SME equity, endowments) and offer time-limited, front-loaded personal-income-tax relief upon return, subject to caps, residency requirements, and claw-back; third, institutionalise knowledge and innovation compacts with the diaspora—fast-track credential recognition, return fellowships with micro-grants, co-supervised training tracks, co-organised scientific meetings, and templated industry collaboration and technology-transfer agreements. These instruments avoid extraterritorial taxation, are compatible with non-discrimination and double-taxation norms, and are operationally tractable; with transparent earmarking and routine monitoring, they can recover a meaningful share of fiscal leakages while converting high-skill mobility into measurable gains in human capital, research capacity, and innovation.

Despite offering one of the first systematic estimations of the fiscal cost of brain drain in Türkiye, this study is not without limitations. The most significant constraint concerns data availability: official statistics on brain drain are limited to higher education graduates and cover only the 2015–2023 period. This temporal and categorical limitation restricts the scope of the analysis and may overlook recent shifts or trends in skilled emigration beyond university–educated cohorts. Furthermore, the study focuses exclusively on direct public education expenditure and does not account for indirect fiscal losses such as forgone tax revenues, reduced domestic productivity, or innovation-related spillovers. Future research could enhance this framework by incorporating additional cost components–such as healthcare subsidies, R&D potential losses, or sector-specific public investments. Cross-country comparative studies employing harmonised migration and fiscal data could also

provide deeper insights into how fiscal losses from brain drain vary by institutional capacity, education finance systems, and policy responses.

In summary, the outmigration of highly educated individuals generates not only abstract developmental challenges but also measurable fiscal losses for sending countries. By presenting one of the first data–based estimations of this loss in the case of Türkiye and framing it within the Bhagwati framework, this study offers both quantitative insight and policy–relevant guidance. Addressing the brain drain problem effectively will require a careful balance between ethical considerations of fiscal justice and realistic, cooperative policy mechanisms adapted to the dynamics of international labour mobility.

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