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Research Paper

Determinants of Undocumented Oil Trade in Pakistan: A Multinomial Logit Approach

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Executive Summary

This study examines the underlying factors driving the persistence of Undocumented Oil Trade (UOT) in Pakistan, with a particular focus on the Pakistan-Iran border region. It argues that, despite a series of policy interventions by the Government of Pakistan, UOT remains a significant and unresolved policy challenge.

While international scholarship offers a range of theoretical frameworks for understanding informal trade networks, the phenomenon of UOT remains underexamined in the context of emerging economies like Pakistan. Based on a multinomial logit model, this paper highlights the key drivers of UOT. It highlights that one million people reside within 50 kilometres of the border, and around two million are economically tied to UOT activities.

Using both primary and secondary data, it demonstrates that UOT is not an economic phenomenon but a spatial and cultural reality. The region's limited development, lack of mobility, restricted skill awareness, emotional attachment to the homeland, low population density, and significant interdependence with Iranian border towns create economic and logistical incentives for the ongoing UOT and support reliance on it.

Providing alternative employment opportunities to such a large segment of the population poses a significant policy challenge, especially considering Balochistan's limited industrial base, underdeveloped infrastructure, and historically marginal integration into the national economy.

The Government may:

- Develop formal border markets in key border towns equipped with warehousing, banking, and other trade & customs related facilities.
- Follow a gradual, incentive-based formalisation process that requires integrated strategies promoting education, inclusive finance, and tax reforms sensitive to informality.
- Launch public-private partnership initiatives focused on skill development in trade-related services, particularly for the youth of border communities, with targeted vocational training in areas like logistics, IT, and retail.

Introduction

Globally, the oil trade is integral to modern life, powering millions of vehicles and industries across the world. More than 100 million barrels of oil flow daily from producers to consumers. With this trade, UOT accounts for an estimated 7 percent of the global oil supply[1]. In Pakistan, the UOT likewise has a significant share in the country's oil supply. A significant fuel consumption is met through undocumented channels, particularly in border regions like Balochistan[2].

The Government of Pakistan has taken various measures to address the UOT issue. These efforts include formalising and regulating its undocumented trade while improving border management along its 909 km border with Iran. These measures include lighting the border, its physical fencing, and enforcing regulations on the movement of goods[3]. Nevertheless, they have failed to address the UOT challenges and have disturbed the livelihoods of border residents by limiting job opportunities while contributing to economic instability.

A considerable amount of literature with a multitude of theoretical frameworks is available on the formalisation of UOT, examining its characteristics and effects on both formal and informal economies worldwide. However, the domain of the UOT and its many counterparts is still in its infancy, particularly in emerging economies like Pakistan.

The literature suggests that implementing efficient policies to tackle UOT challenges involves, first and foremost, exploring its determinants, finding ways to incentivise UOT formalisation, and considering possible alternatives, with an aim to stimulate the local economy[4].

The present study aims to explore the determinants of UOT. It highlights that in Pakistan, as well as in Balochistan and Iran, UOT asymmetrically correlates with the geography and culture of the Balochistan province, impacting the residents of the frontiers differently from the rest of the

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[1] In this study, "fuel or oil" refers to High-Speed Diesel (HSD) and Petrol (also known as Gasoline, Motor Spirit (MS), etc.). These two fuels are selected because a major portion of the economy and supply chains depend on them (Romsom, 2022). The rest of the undocumented activities lie outside the scope of this research.

[2] Dell'Anno, R. (2023). Measuring the unobservable: estimating informal economy by a structural equation modeling approach. *Int Tax Public Finance*, 247–277.
Division, C. (2021). *Report of the Inquiry Commission on Shortage of Petroleum Products in Pakistan.* Islamabad: Cabinet Division.

[3] Raheem, A., Badshah, I., & Arshed, W. (2021). Political economy of smuggling: The living source for the natives (a case study of Jiwani-Iran Border, Baluchistan). *Journal of Development and Social Sciences*, *2*(4), 835–848.

[4] Keshavarz, M. &. (2022). *Seeing Like a Smuggler: Borders from Below.* Pluto Press.

country. Unlike other provinces of Pakistan, Balochistan and Iran are deeply interconnected due to their geographical proximity. Nearly one million people in Balochistan reside within 50 kilometres (KM) of the Pakistan-Iran border, with an estimated 200,000 households living in this area. Almost 2 million individuals rely directly and indirectly on UOT.

Both the primary and secondary data provided in this study show that UOT has both concurrent and long-term effects in Balochistan. Similar insights were provided by the studies (such as Dadpay (2020) and Mozayani (2021) conducted around the globe[5].

Multiple conclusions have been drawn from this study. Currently, due to critical fiscal constraints, both the provincial and federal governments may not possibly be able to sustain the livelihood of the Baloch living in nearly half of Pakistan's geography and close the border at once, especially in a province with one-seventh of the national population density. It requires a long-term effort to fully formalise and document UOT and improve broader socioeconomic outcomes such as income growth, employment creation, and poverty alleviation in border towns while incentivising people towards the formalisation of UOT.

An optimal strategy would encourage and incentivise a gradual shift from undocumented to documented trade on the one hand and stimulate economic growth on the other hand. However, all this should be done based on the details about the UOT.

Finally, it concludes that there are no one-size-fits-all solutions. Improving access to education, accounting for informality when designing tax and social protection systems, and enhancing financial inclusion, can help the GOP in solving the UOT conundrum[6].

Contributions of the study

This study is the first scientific and quantitative study of its kind in Pakistan. Unlike most recent studies carried out in Pakistan, this study researches field surveys based on primary data, providing precise insights about determinants of UOT and its socioeconomic footprints as well as the size of UOT in Pakistan. Moreover, the study employs the logit model to explore the critical determinants of UOT. This helps in highlighting the critical factors and allows for the presentation of consistent and accurate results.

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[5] Mozayani, A. H. (2021). The Political Economy of Commodity Smuggling (The Case of IR of Iran). Iranian Economic Review, 25(1), 121-135.

[6] These findings are also a must-read for government officials and individuals interested in designing policies to create a more prosperous documented trade.

Literature Review

UOT has long been intertwined with local economies, particularly in border regions. After 1979, following the Iranian revolution, scholars such as Wang (1994) in Africa highlighted the major determinants of UOT. Power and energy policies, especially those related to oil prices and currency, play a crucial role in oil trade. The study emphasizes that incompatible pricing strategies contribute to a surge in UOT across borders.

Building on this, Weimar (2008) [7] argues that inadequate and inconsistent enforcement mechanisms, especially in peripheral regions, create institutional gaps or vacuums that allow tax evasion and UOT. The study moreover states that weak governance and fragmented state presence enable UOT to become a normalized economic activity in border communities.

However, Karjanen (2012) stated that the flow and production of both documented and undocumented goods and services are intertwined. Hence, for a better understanding of the detrminants, simultaneously exploring the whole of the documented and undocumented economy is important. The study depicted a significant role of illicit goods in the overall economic change that happened in the post-socialist economy, fostering marketization and commercial development at household and firm levels.

Within Iran, Varavay (2015) argues that despite increased spending on border control in Kermanshah province, the persistence of UOT underscores the inefficacy of government policies due to multiple financial incentives, weak enforcement capacity, and the profitability of cross-border fuel price differentials.

Mozayani (2021) explores the non-economic factors that influence UOT. The study's findings shows that, despite being commonly viewed as an economic concern, UOT is a multidimensional process with diverse non-economic origins, including social, cultural, political, and geographical factors.

Likewise, Raheem (2021) [8] further expanded the UOT debate. It reveals that both UOT and documented economy can work in parallel. The reliance of Balochistan's local population on cross-border smuggling is driven by kinship relations and the absence of formal economic opportunities in the Jiwani-Iran (Pak-Iran) border. The possession of Iranian identity cards (Sajjil)

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[7] Weimar, M. R. (2008). *Identifying and Quantifying Rates of State Motor Fuel Tax Evasion.* Transportation Research Board.

[8] Ibid.

and dual nationality grants them advantages in conducting daily business, while border-crossing agreements (rahdari) facilitate frequent travel to Iran.

Zafran (2022) employs the utility theory to explore the determinants of UOT. Moreover, the study reveals that family involvement and constrained formal sector opportunities are factors driving individuals toward UE in Quetta.

Recent studies by Gallien (2021) and Khosravi (2022) reaffirm the multidimensional nature of UOT. It highlighst that UOT is a transnational cross-border issue. Not only economic but also political and social factors of multiple economies come into play. These studies highlight the global interconnectedness of UOT, emphasizing that measures to control it require a holistic approach that addresses both market dynamics and transnational cross-border governance.

Muhammad Saleem (2022) also identified multiple determinants and socioeconomic factors related to undocumented trade at the 2,640 km Pak-Afghan border. The study states that the role of state and non-state actors is equally important in UE. Each new strategy adopted by authorities prompts a corresponding shift in tactics among smugglers, leading the government to focus on taxing and regulating profits from smuggling to better manage the market.

Boonsrinugul (2023) indicate that behaviors of the authorities, consumption patterns, and decision-making attitudes affect fuel stations significantly. Moreover, it states that UOT evolves with time. Different time periods need different station management measures to control UOT.

In conclusion, UOT is shaped by a range of structural, institutional, and contextual factors. Earlier studies emphasized economic and financial drivers such as pricing disparities, currency volatility, and weak enforcement mechanisms. However, the recent literature underscores the multidimensionality of UOT. It illustrates the interplay of social, political, cultural, market, and consumer behaviors, as well as geographical influences. This body of literature provides a strong motivation for this study by offering both theoretical insights and practical evidence on how and why UOT may persist across various contexts.

Methodology

UOT (Undocumented Fuel Trading) is influenced by a variety of socio-economic factors, particularly affecting those living in border regions. Key determinants include economic factors (e.g., higher wages, lack of jobs, number of jobs performed), geographic and physical access (e.g., distance to the border, vehicle ownership), social capital (e.g., kinship relations, household characteristics), and security/volatility (e.g., save from chaos, accidents).

Multinomial Logit model

Bentham (1843) laid the groundwork for utility theory, which assumes that individuals act rationally to maximise their utility. This principle has guided the development of many econometric models, including discrete choice frameworks. In UOT, utility theory explains how individuals assess options based on expected gains, such as higher income or cost savings, and make trade-related decisions accordingly.

Multinomial Logit models become particularly useful as it allows for the estimation of choices across multiple alternatives, where each decision reflects either a utility-maximising calculation (while controlling for other characteristics). Multinomial logit regression models have multiple equations with a dummy dependent variable with k-1 equations and k categories (depending on the problem at hand). In this paper, two equations are used for a k (k=3 in this study) categories variable–that is, k−1 equations. For instance, UOT participants make different visits per month **(a)** only one visit, **(b)** 2 visits, **(c)** 3 or more than 3 visits. Here the response variable have three levels. The situation can be defined as follows:

$$UFT_1 = a_1 + a_2X_{2i} + a_3X_{3i} + \cdots + a_kX_{ki} + ui \qquad \textit{(1)}$$

$$UFT_2 = \beta_1 + \beta_2X_{2i} + \beta_3X_{3i} + \cdots + \beta_kX_{ki} + vi \qquad \textit{(2)}$$

which can be estimated by either the logit or the probit method, based on the distribution of the disturbances (*ui or vi*) of the data.

Where UOT_1 and UOT_2 is the utility that a trader obtain from choosing a specific trade frequency; the number of visits to the border (0, 1,2,3...).

This study aims to explore a phenomenon that is **"**why some UF traders decide to choose three trips over two or one". This variable is a polychotomous (it takes the value of 1,2, or 3). In the model, $[X_i]$ refers to the determinants while $[a_2 \; and \; \beta_2]$ refers to their respective coefficients. The individual selects $\mathbf{UOT_i}$ that maximises the utility or the satisfaction that a fuel trader obtains from a specific visit. The results of the two equations can be interpreted as the probabilities of using the

number of visits described by each equation. This method eliminates any underlying bias (such as in the case of a simple probability model that results from the unobserved explanatory variables) by using multiple variables as latent variables in the multinomial model. Moreover, the properties of the large sample size, the maximum likelihood estimation method are employed to yield consistent coefficient estimates respectively. For this study, a null hypothesis is developed assuming that all the coefficients are equal to zero in the model (indicating that the determinants have no significant impact on participation in UOT) versus that one coefficient is not zero (suggesting that the determinants significantly influence participation in UOT), precisely:

H_0: All coefficients are equal to zero.

H_1: At least one coefficient is not equal to zero. **(3)**

This method is like the F test in the simple regression model[9]. For the significance/goodness of the model pseudo R^2 and p-value criteria is followed.

The following factors were analyzed using the multinomial logit model. In the analysis, the sample size is equal for all the variables: 240.

Table 1: Variable Description

Variables	Description
trips	Number of trips of UOT per month.
kinship	Influence of kinship relations on the selection of UOT trips (Likert scale).
age	Age of the UOT trader in years.
zamyad	Number of zamyads (vehicles used for fuel smuggling) owned by the trader.
jobs	Types of jobs performed in UOT.
income	Monthly income from UOT in PKR.
accidents	Number of accidents experienced in UOT activities.
roleinfamily	Role of the trader in the family (Likert scale).
marit	Marital status of the trader (Single, Married, etc.).
hhsize	Household size of the trader's family.
housetype	Type of house where the trader resides (Mix, Mud, etc.).
urband	Influence of urban demand for fuel on UOT participation (Likert scale).
highwagepros	Influence of higher wages in UOT on the trader's decision (Likert scale).
extrafee	Impact of extra fees imposed by authorities on UOT participation (Likert scale).
lackmarkets	Impact of lack of formal markets on UOT participation (Likert scale).
lackcorrid	Impact of lack of corridors or infrastructure on UOT participation (Likert scale).

[9] Simple linear regression model assumes linear relationship between two variables and estimates coefficients of a regression model by minimizing its sum of residuals (Asteriou & Hall, 2021). In both models, if the p-value (alpha) is less than 0.05, the F test rejects the null hypothesis.

lackjob	Impact of lack of government jobs on UOT participation (Likert scale).
savefromchaos	Agreement level on "borders save from chaos, insurgency, etc. or not (Likert scale).
docu	Impact of undocumentedness/docu of trade on UOT participation (Likert scale).
marginali	Impact of marginalization and grievances on UOT participation (Likert scale).
line	Characteristics of the settled line of oil smuggling impacting UOT activities.
hcapital	Influence of underdeveloped human capital on UOT participation (Likert scale).
economy	Influence towards UOT as it keeps the economy stable (Likert scale).
distance	Distance from the border in kilometers.
illicit	Participation in UOT due to its facilitation of illicit activities (Likert scale).
exp	Years of experience in UOT activities.
edu	Years of education completed by the trader.
Source: Based on the UOT survey	

The above table provides a brief overview of the variables used in the study. The variables are categorised according to their descriptions and types. In the trips variable, 1 trip is performed by individuals or owners of Zamyads, 2 trips are carried out by drivers. 3 or more trips are performed by traders who have more than one Zamyad and an oil depo, which is often registered in multiple districts. Further details of the variables are provided in the conceptual framework.

Results of the Multinomial Logit Model

The multinomial logit model aims to explore the critical determinants of UOT. The dependent variable is the number of trips (1 trip, 2 trips, or 3 or more trips), with 1 trip being the benchmark category. The independent variables include kinship relations, age, Zamyads (vehicles used for UOT), jobs, income, accidents, family role, marital status, household size, house type, urban demand, higher wage prospects, extra fees, lack of markets, lack of corridors, lack of government jobs, perception of chaos, documentation status, marginalization, settled line of oil smuggling, human capital, economy, distance from the border, illicit activities, experience, and education.

The following table shows the estimated coefficients, standard errors, and z-values for each independent variable, comparing the likelihood of 2 trips and 3 or more trips to the benchmark category, 1 trip.

Table 1: Coefficients and Statistics of the Multinomial Logit Model						
Independent Variables	**2 Trips Coefficient**	**2 Trips Std. Error**	**2 Trips z-value**	**3 or More Trips Coefficient**	**3 or More Trips Std. Error**	**3 or More Trips z-value**
Intercept	-23.56	0.00	-102240.80	-3.76	0.00	-13977.40
kinship	-0.07	0.00	-81.33	-0.06	0.00	-63.38
age	-0.06	0.01	-5.09	-0.05	0.01	-3.45
zamyad	-0.44	0.00	-1880.76	1.44	0.00	3920.99
jobs	0.56	0.00	1966.91	-0.10	0.00	-443.21
income	0.00	0.00	-1.23	0.00	0.00	0.72
accidents	0.01	0.00	8.94	-0.03	0.00	-29.96
hhsize	-0.09	0.00	-61.92	0.06	0.00	29.84
urband	-0.26	0.00	-1663.72	-0.62	0.00	-4561.32
highwagepros	-0.22	0.00	-452.79	1.18	0.00	1557.07
extrafee	-0.15	0.00	-155.84	-0.08	0.00	-60.75
lackmarkets	0.02	0.00	26.97	-0.01	0.00	-10.19
lackcorrid	-0.31	0.00	-875.48	0.45	0.00	923.05
lackjob	-0.22	0.00	-234.72	-0.21	0.00	-198.65
savefromchaos	0.24	0.00	1769.18	0.36	0.00	1547.26
docu	-0.24	0.00	-726.04	0.04	0.00	121.29
line	-0.28	0.00	-3823.97	1.53	0.00	5059.87
hcapital	0.42	0.00	3438.79	-0.53	0.00	-2665.82
economy	-0.25	0.00	-301.69	0.00	0.00	-1.87
distance	0.00	0.00	0.11	-0.01	0.01	-2.43
illicit	0.16	0.00	279.06	0.35	0.00	817.87
exp	0.05	0.00	29.59	-0.06	0.00	-37.29
edu	-0.07	0.00	-30.89	0.21	0.00	99.71

Source: Author's based on UOT survey

Discussion

The results indicate a variety of significant and non-significant relationships between the independent variables and the likelihood of a trader choosing 2 trips or 3 or more trips against 1 trip. Insights for each variable are highlighted hereunder:

Kinship Relations

At the Pak-Iran border, individuals living on the both sides of the borders (Pakistan and Iran) share common language and culture (Balochi), values, and history. The negative coefficients for both 2 trips and 3 or more trips indicate that stronger kinship relations are associated with a lower likelihood of taking multiple trips. This suggest that individuals have stronger kinship ties as compared to traders.

Strong kinship ties and familial responsibilities also reduce the likelihood of making multiple trips, suggesting that traders or individuals exploit their kinship relations to do UOT. Such individuals have kinship relations across the border. However, traders/agents use and rely more on their wealth in UOT. They hire many individuals, have more cars, use their political influence/affiliation, and vice versa. (Najeeb (2022) likewise theoretically discussed the phenomena.

Extra Fees

The imposition of extra fees has a negative impact on the likelihood of multiple trips. This is likely due to increased costs bureaucratic hurdles sludges which reduce profitability. Kirabaeva & Kedina (2022) empirically estimated the drivers of the informal economy in European countries. They find that regulatory quality, poor economy, and tax burden tend to be associated with higher informality. Factors such as trade openness and higher productivity are associated with lower informality. Similar insights are provided by the model of this study.

Age

Older traders are less likely to undertake multiple trips. This is due to the physical demands and risks associated with multiple trips being less appealing or feasible for older individuals (Deléchat & Medina, 2021).

Zamyads (vehicles)

The significant positive coefficient for 3 or more trips suggests that ownership of more Zamyads increases the likelihood of undertaking multiple trips. More vehicles means more fuel, more utility, more wages, and more income.

Income

The small and mixed effects of income on trip frequency suggest that income alone is not a strong determinant of the number of trips. Other factors such as wealth, the setting in the system etc. play significant roles. A person may be performing 2 trips per month but his income may be PKR 15,000 in case he is a driver. Another person who has his own car may earn PKR 50,000 per month in case he has his own car and the oil price differential is high between the border rate and the rate in the adjacent cities.

Accidents

More accidents are negatively associated with the likelihood of making 3 or more trips. This shows that traders who have experienced more accidents might be deterred from frequent trips due to the associated risks. As the number of accidents increases the likelihood of taking more trips becomes lesser. Drivers prefer fewer trips (1 or 2) and just use UOT to keep bread and butter.

Household Size

A larger household size decreases the likelihood of making 2 trips but increases the likelihood of making 3 or more trips. Households that have a large family size have a more active labour force and have high likelihood of making more trips because it helps the driver to get more support the from family (Mengstu, 2023)

Urban Demand

Traders influenced by urban demand are less likely to make multiple trips. This is not in line with the literature. Further factors should be explored to see the

Higher Wage Prospects

Higher wage prospects have a mixed effect, decreasing the likelihood of 2 trips (as getting high wages per day) as a driver is quite not possible. However, it significantly increasing the likelihood of 3 or more trips. This suggests that the potential for higher earnings incentivises the traders for more frequent trips.

Lack of Markets

Lack of markets significantly increases the likelihood of 2 trips but decreases the likelihood of 3 or more trips. This in particular related to the political economy of UOT. In the case of fewer markets means that a driver can still perform 2 trips. However, more than 2 trips are not possible for a trader. This shows that while the absence of markets may not prompt drivers to make an additional trip, however, it acts as a constraint on making too many trips.

Lack of Government Jobs

The lack of government jobs negatively impacts the likelihood of making multiple trips, suggesting that alternative employment opportunities might reduce the need for frequent trips which can also result in alternative livelihood opportunities which are not in abundance.

Perception of Chaos

Traders who believe that the borders save them from chaos in terms of economic stability are more likely to undertake multiple trips, possibly seeing UOT as a safer or more stable option. They invest their income in a safe environment. Border closures have adverse effects on the region. It results in joblessness, poverty, and hunger which alternatively leads to chaos, terrorism, and over instability. Saleem (2022) also states that nearly one million people in Balochistan reside within 50 kilometres (KM) of the Pakistan-Iran border. Almost 2 million individuals rely directly and indirectly on the undocumented economy. Such economic opportunities save them from chaos in terms of economic stability via a regular income stream.

Documentation

Documentation influences 2 trips but slightly more towards 3 or more trips. This is due to the ownership of tokens to cross the border. A person who is registered with the district authorities.

Settled UOT Line

Having a settled line of UOT significantly increases the likelihood of making 3 or more trips, indicating that established smuggling networks facilitate frequent

Human Capital

Underdeveloped human capital is positively associated with making 2 trips but negatively with making 3 or more trips, indicating that lower skills might prompt some additional trips but also act as a constraint on frequent trips. Driver and traders associated with 3 or more trips do not consider human capital a significant determinant as they are not attractive towards human capital related jobs of government or private jobs which require human capital. Thus, don't consider it a significant determinant.

Economy

The incentive of a stable economy attracts drivers, traders, and individuals towards UOT. However, individuals are more likely to choose a single trip and thus consider it a more significant determinant than drivers and traders. According to Muhammad (2022) and Shah (2024), border closure often results in an unstable economy due to the unavailability of alternative employment opportunities.

Distance from Border

The distance from the border has mixed effects, with an insignificant impact on 2 trips (drivers) as the cost of the transport is not bear by the driver but a negative impact on 3 or more trips, as logistical challenges emerge from the distance for the businesses of a trader. This, however, suggests that not only the people living near the border are dependent on the border trade, but the rest of the province is also dependent on the border trade. The border provides livelihood to everyone in the province without much discrimination. Moreover, Dalbandin and Noshki are around 500-600 km away from the Border. Drivers from those Tehsil are engaged in the border trade as well. It also confirms a population density near the Pak-Iran border, with significant reliance on UOT.

Illicit Activities: Incentives for illicit activities nonetheless increase the likelihood of multiple trips for traders. However, for individuals there is less likelihood to conduct illicit activities using UOT as, for them, UOT is a source of livelihood. There are very few income choices with an underdeveloped agriculture industry in the border region. Globally, regions, where illicit activities or black markets like narcotics prevail, have a developed/high living standard, unlike Balochistan (Edwards, 2010).

Experience

More experience slightly increases the likelihood of making 2 trips (drivers) but decreases the likelihood of making 3 or more trips as compare to 1 trip, indicating that seasoned drivers are needed for this activity. Doing this difficult activity is not quite possible without experience. Moreover, the occurrence of this activity indicates that this activity is not new at the border but happening since years. An experienced person chooses to become a driver and individual trader rather than becoming a businessman (3 trips) , although it's a very tough job. UOT is a tough job which requires experience.

Education

Higher education decreases the likelihood of making 2 trips but significantly increases the likelihood of making 3 or more trips, suggesting that better-educated traders might pursue more frequent trips. A better-educated individual is less likely to become a driver. Since the wages of a driver are low, that results in a lower return to education. He prefers to go for the role of a trader or individual Zamyad owner.

Findings and Conclusions

This study explored the issue of UOT in Pakistan's Economy. Based on UOT case studies carried out around the globe, comprehensive surveys conducted along the Pak-Iran border from 2022 to 2024, extensive interviews carried out in the four provinces of Pakistan, FGDs with experts & stakeholders, and the analysis of the UOT supply chain, this study highlighted the complex nature of UOT. The findings of this study underscore the social and economic significance of UOT due to its geographical remoteness from the main trade routes of Pakistan.

Based on a multinomial regression model it highlights that a specific singular determinant does not govern UOT participation. Its drivers are rooted in a combination of financial and non-financial factors. The economic burden of high fuel costs in Pakistan, limited livelihood & employment opportunities, prospects of economic stability, and kinship relations in the border regions create an environment where UOT becomes a rational choice for many living along the Pak-Iran border.

Among others, the critical determinants of UOT include the region's underdevelopment, characterized by inadequate infrastructure, limited access to education, and an absence of viable economic opportunities. The lack of a skilled labour force and the absence of industries or other employment-generating sectors exacerbates the situation. Insufficient agricultural development due to non-arable lands limits livelihood opportunities. Additionally, kinship relations, attachment to the homeland, and unwillingness to migrate to more developed regions of Pakistan perpetuate reliance on UOT. The unwillingness stems partly from a lack of awareness about opportunities to acquire skills in other provinces that could be used to contribute to the development of Balochistan. As a result, the region remains trapped in a cycle of underdevelopment and economic dependence on UOT.

The kinship relations further indicate that familial networks are critical in continuing UOT. Almost every Baloch family in border areas has at least one kinship tie extending into Iran. These relationships serve as a vital means of income and connect the Baloch people to their cultural roots, making UOT a cornerstone for economic survival and social cohesion in the border region.

Typically, it is assumed that the documented sector decreases if the undocumented sector increases (Yonous, 2024). However, different activities across boundaries are interconnected, possibly in mutually dependent or complementary ways, as shown in this study. Informal employment is central to the formal economic functioning of Balochistan. It is more useful to see such employment and the production & flow of goods within a spectrum of work that encompasses different levels of formality and informality.

Recommendations

Globally, multiple states allow the production and sale of undocumented/illegal goods in some cases but not in others (Kashvraz, 2022). Goods may be legal according to law but illicit according to social norms (like alcohol). Likewise, some goods may be illegal but licit; that is to say, counter to state law but socially accepted. Such a situation describes border areas of Balochistan where UOT occurs, and undocumented goods are sold directly and openly without significant restrictions. Examining the linkages between these different domains is vital.

In summary, it requires a long-term effort to fully formalise and document UOT and improve broader socioeconomic outcomes such as income growth, employment creation, and poverty alleviation in border towns while incentivising people towards the formalisation of UOT.

The Government may:

- Support alternative employment options by promoting small-scale enterprises in handicrafts, local foods, and value-added products that match the skill profiles of the region's workforce and have low capital intensity.
- Focus on service-sector activities such as hospitality and tourism by utilising the natural coastal and mountain landscapes of Balochistan. This can generate employment without heavy infrastructure investment.
- Conduct a comprehensive review of existing UOT regulatory measures and develop a policy framework focused not just on tariff collection but also on sustainable development, livelihood security, and regional connectivity.
- Implement a phased approach to formalise UOT through pilot programs that gradually transition traders from undocumented to documented status with the help of financial incentives, reduced compliance burdens, and soft enforcement.
- Promote transnational cooperation by pursuing targeted or limited sanction waivers to ease financial transaction barriers and allow cross-border trade to occur through legitimate channels under international legal frameworks.
- Encourage and incentivise a gradual shift from undocumented to documented trade on the one hand and stimulate regional growth on the other hand.
- Align its custom policies with the social realities of the local populace and local social norms while reducing distrust and acknowledging the intricate web of relationships that define the region by facilitating legal frameworks that empower individuals and communities.

Action Matrix

Policy Action	Implementing Institutions	Timeline	Expected Outcome
Develop coastal and mountain tourism infrastructure	Ministry of Tourism, Govt of Balochistan, BOI	Medium-term (2-5 years)	Job creation through service-based enterprises and promotion of regional integration
Review and revise current UOT regulations	Ministry of Finance, FBR, Customs. Ministry of Law	Short-term (0-1 year)	Improved policy coherence focusing on sustainable growth over revenue maximisation
Initiate pilot programs for phased formalization of UOT	FBR, Customs, local administration	Medium-term (1-3 years)	Gradual transition of informal traders into the formal economy
Pursue sanctions waivers and ease cross-border financial flows	Ministry of Foreign Affairs, SBP, MoC	Short- to mid-term (1-3 years)	Smoother, legal cross-border transactions aligned with international norms
Formulate data-driven policies using regional HDIs	PBS, Planning Commission, academia.	Ongoing	Targeted interventions that reflect ground realities and promote evidence-based governance
Reduce regulatory rigidities and incorporate social norms in UOT governance	Ministry of Law, local governments, think tanks	Ongoing	Improved local compliance, reduced corruption, and trust-building between the state and communities
Establish formal border markets with warehousing, banking, and customs	Ministry of Commerce, FBR, Govt of Balochistan	Medium-term (1–2 years)	Regulated trade environment that reduces black-market activity
Launch PPP-based skill training programs in trade and services	SMEDA, Ministry of Industries	Short-term (0-2 years)	Increased employability of youth and gradual detachment from UOT-dependent occupations
Promote small-scale enterprises in Balochistan such as handicrafts and food industries	SMEDA, Ministry of Industries	Short-term (0-2 years)	Diversified livelihood options in border communities

About the Author

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