A Research on the Use of Digital Turkish Lira in Foreign Trade Transactions

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Abstract

This study examines the potential uses and potential impacts of the Digital Turkish Lira in foreign trade. The growing role of digital currencies in global trade presents strategic opportunities for Turkey. The Digital Turkish Lira aims to reduce transaction times and provide speed and efficiency in commercial transactions. Furthermore, reduced transaction costs may create new market opportunities for small and medium-sized exporters. Smart contracts and blockchain technology will increase security and transparency in foreign trade. The study also evaluated the integration of digital currencies into payment systems. Its potential for use as a reserve currency in international trade was also analyzed. Furthermore, challenges such as legal infrastructure and compliance with international standards were also addressed. Integrating the Digital Turkish Lira into foreign trade processes could enhance Türkiye's competitiveness. Consequently, the Digital Turkish Lira has high potential to become a strategic tool in foreign trade. However, this transformation requires a comprehensive digital infrastructure and multilateral cooperation.

Keywords: Cross-Border Transactions, Trade Finance, Export-Import Mechanisms, Global Payment Systems, Digital Official Currency

ÖZET

Bu çalışma, Dijital Türk Lirası'nın dış ticaretteki potansiyel kullanım alanlarını ve olası etkilerini incelemektedir. Dijital para birimlerinin küresel ticarette artan rolü, Türkiye açısından stratejik fırsatlar sunmaktadır. Dijital Türk Lirası, işlem sürelerini azaltarak ticari işlemlerde hız ve verimlilik sağlamayı hedeflemektedir. Ayrıca, işlem maliyetlerinin düşmesi sayesinde küçük ve orta ölçekli ihracatçılar için yeni pazar fırsatları doğabilir. Akıllı sözleşmeler ve blokzincir teknolojisi sayesinde dış ticarette güvenlik ve şeffaflık artacaktır. Çalışmada, dijital para biriminin ödeme sistemlerine entegrasyonu da değerlendirilmiştir. Uluslararası ticarette rezerv para birimi olarak kullanım potansiyeli de analiz edilmiştir. Bununla birlikte, yasal altyapı ve uluslararası standartlara uyum gibi zorluklar da ele alınmıştır. Dijital Türk Lirası'nın dış ticaret süreçlerine entegrasyonu, Türkiye'nin rekabet gücünü artırabilir. Sonuç olarak, Dijital Türk Lirası'nın dış ticarette stratejik bir araç haline gelme potansiyeli yüksektir. Ancak bu dönüşüm, kapsamlı bir dijital altyapı ve çok taraflı iş birliği gerektirmektedir.

Anahtar Kelimeler: Sınır Ötesi İşlemler, Ticaret Finansmanı, İhracat-İthalat Mekanizmaları Küresel Ödeme Sistemleri, Dijital Resmi Para

1. INTRODUCTION

With the impact of digital transformation, international trade has entered a period in which not only goods and services but also payment infrastructures are being redefined. In this new process, criteria

such as speed, transparency, cost advantage, and security directly impact the payment methods preferred in foreign trade transactions. Blockchain technologies, Central Bank Digital Currencies (CBDCs), and smart contract-based payment systems, in particular, have the potential to transform not only the financial but also the operational structure of foreign trade. In this context, states are forced to adapt not only to domestic market regulations but also to the increasingly digital nature of international trade. Examples such as China's Digital Yuan (e-CNY), the European Central Bank's Digital Euro, and the US's Digital Dollar projects demonstrate the potential for digital currencies to create a competitive advantage in international trade payments.

The adoption of CBDCs in international trade introduces significant opportunities for enhancing efficiency and reducing transaction costs, particularly for emerging economies seeking to strengthen their position in global trade networks. By leveraging blockchain technology, CBDCs can facilitate near-instantaneous cross-border payments, bypassing traditional intermediaries like correspondent banks, which often impose high fees and delays. For instance, the Digital Yuan has been piloted in cross-border trade settlements, demonstrating reduced transaction times and costs (Auer et al., 2020). This aligns with the principles of the Heckscher-Ohlin model, which emphasizes efficient resource allocation through trade (Heckscher, 1919; Ohlin, 1933).

For countries like Türkiye, implementing a Digital Turkish Lira could enable small and medium-sized enterprises (SMEs) to access global markets more effectively by lowering the financial barriers associated with traditional payment systems. However, the success of such initiatives depends on robust digital infrastructure and interoperability with global payment systems, which remain underexplored in the literature on emerging markets' trade strategies. Despite their potential, the integration of CBDCs and blockchain-based payment systems into foreign trade faces significant challenges, including regulatory harmonization and technological adoption. The complexity of aligning domestic legal frameworks with international standards, such as those set by the Financial Action Task Force (FATF), poses a barrier to widespread CBDC adoption in trade (Cunha et al., 2021). Moreover, the digital divide between developed and emerging economies could exacerbate inequalities in accessing these technologies, potentially marginalizing smaller economies in global trade networks.

The New Trade Theory's focus on economies of scale and market access (Krugman, 1979) suggests that only countries with advanced technological capabilities may fully capitalize on CBDCs, leaving others at a disadvantage. For Türkiye, addressing these challenges requires multilateral cooperation and investment in digital infrastructure to ensure that the Digital Turkish Lira can compete with established digital currencies like the e-CNY or Digital Euro, thereby enhancing its role in global value chains (Baldwin, 2016). For Türkiye, the Digital Turkish Lira offers the opportunity to offer a new paradigm in foreign trade financing through the digital representation of the national currency (Boar & Wehrli, 2021). The global economy is undergoing a continuous transformation driven by technological advances. This transformation is also making itself felt strongly in foreign trade transactions, and a new payment ecosystem is emerging where elements such as transaction security, cost-effectiveness, speed, and transparency are at the forefront (Acar, 2023). Payment methods in international trade play a central role in reducing financial risk and establishing trust between parties.

In addition to classical methods such as letters of credit, cash against documents, and open accounts, electronic payment systems and digital currencies have gained importance in recent years as alternative solution tools. Central banks are working on new tools to support traditional monetary policy in line with the opportunities offered by digitalization (Ağsakal and Erkan, 2016). Central Bank Digital

Currencies (CBDC), developed in this context, aim to respond to the needs of the digital age, increasing the efficiency of payment systems, strengthening financial inclusion, and reducing reliance on cash. This study has the potential to contribute to the literature by offering a country-specific analysis of the Digital Turkish Lira in the context of foreign trade, emphasizing its potential to reduce transaction costs, enhance efficiency, and support SMEs. By linking blockchain-based security and transparency with strategic considerations such as reserve currency potential and regulatory challenges, the study extends existing CBDC research with both practical and policy-oriented insights.

1.1. Fundamentals and History of Foreign Trade

The theoretical framework of foreign trade is rooted in economic theories that explain why countries engage in international trade and how it impacts their economies. One foundational theory is Adam Smith's absolute advantage, which posits that countries should specialize in producing goods they can manufacture more efficiently than others, thereby maximizing global output through trade. This was expanded by David Ricardo's theory of comparative advantage, which argues that even if a country is less efficient in producing all goods, it can still benefit from trade by specializing in goods where it has a relative efficiency advantage. Ricardo's model emphasizes opportunity costs, demonstrating that trade can lead to mutual gains even when one country has an absolute advantage in all goods. These classical theories assume perfect competition and static gains from trade, focusing on specialization based on resource endowments (Ricardo, 1817). Modern trade theories build on these foundations, incorporating more complex factors such as imperfect competition and economies of scale.

The Heckscher-Ohlin model suggests that countries export goods that intensively use their abundant factors of production (e.g., labor, capital) and import goods that use their scarce factors. This model highlights the role of factor endowments in determining trade patterns and predicts that trade equalizes factor prices across countries under certain conditions (Heckscher, 1919; Ohlin, 1933).

Additionally, Paul Krugman's New Trade Theory introduces the role of increasing returns to scale and product differentiation, explaining intra-industry trade between similar economies. For instance, countries with similar income levels trade differentiated products (e.g., cars) due to consumer preferences for variety and economies of scale in production (Krugman, 1979).

These theories shift focus from comparative advantage to market structures and consumer behavior. Recent developments in trade theory incorporate dynamic and institutional factors, such as technology, trade costs, and global value chains. The Melitz model (2003) emphasizes firm heterogeneity, where only the most productive firms engage in exporting due to fixed trade costs, leading to productivity gains through trade liberalization (Econometrica, 2003).

Additionally, theories of global value chains highlight how production processes are fragmented across countries, with trade occurring in intermediate goods rather than just final products (Baldwin, 2016). These frameworks underscore the role of trade policies, technological advancements, and institutional factors like tariffs and trade agreements in shaping trade flows.

By integrating classical, neoclassical, and modern perspectives, the theoretical framework of foreign trade provides a comprehensive lens to analyze patterns, benefits, and challenges of international trade in a globalized economy. Foreign trade is an activity that constitutes one of the fundamental dynamics of economic cooperation, which refers to the exchange of goods and services between

countries. The roots of foreign trade date back to the earliest periods of human history, and the form, scope, and methods of trade have undergone significant evolution over time.

Initially based on barter, trade activities acquired a systematic and organized structure with the emergence of the monetary economy. In the modern era, globalization and advancements in technology have further transformed foreign trade, enabling faster and more efficient cross-border transactions. International trade agreements and organizations, such as the World Trade Organization, have played a crucial role in standardizing regulations and reducing trade barriers.

Additionally, digital platforms and e-commerce have revolutionized the accessibility and scale of foreign trade, allowing even small businesses to participate in global markets. Furthermore, in his master's thesis, Akbaş (2020) examined the effects of cryptocurrencies on the state's power to print money and establish authority.

The potential threats to the financial sovereignty of states due to the decentralized nature of cryptocurrencies were analyzed in detail. Since ancient times, Mediterranean civilizations have conducted foreign trade activities along trade routes such as the Silk Road and the Spice Route.

1.2. The European Central Bank's Digital Euro Project

The European Central Bank (ECB) has been actively exploring the concept of a digital euro as part of the broader global trend toward central bank digital currencies (CBDCs). The project was formally launched in July 2021 with the Investigation Phase, which lasted until October 2023. During this phase, the ECB examined the potential design, use cases, and policy implications of a digital euro, focusing particularly on its role in retail payments within the euro area (ECB, 2023).

Following the completion of the investigation phase, the ECB entered the Preparation Phase in November 2023. This stage, expected to last until 2026, includes developing prototypes, conducting technical testing with market participants, and finalizing the legislative framework necessary for issuance (ECB, 2023). A possible pilot and eventual issuance of the digital euro would only take place after the European Parliament and the Council adopt the legal foundations currently under discussion (Bindseil & Panetta, 2020).

The primary objectives of the digital euro include:

- Safeguarding monetary sovereignty in the face of global digitalization and private sector stablecoins.
- Strengthening the strategic autonomy of European payment systems, reducing reliance on non-European providers.
- Promoting resilience and innovation in retail payments, ensuring universal access to central bank money in digital form.
- Ensuring consumer privacy and data protection, a key principle guiding the project's design (Panetta, 2022).

Unlike China's e-CNY, which already operates in large-scale pilot projects and targets both domestic and cross-border use, the ECB's digital euro is primarily envisioned as a complement to cash for retail payments in the euro area. It is not intended to replace physical euro banknotes and coins but to ensure that central bank money remains accessible in an increasingly digital economy (ECB, 2023).

The ECB emphasizes that the digital euro must be designed to avoid destabilizing the banking system. To prevent large-scale deposit shifts from commercial banks to central bank accounts, the ECB plans to impose limits on individual holdings. Additionally, measures like tiered interest rates or transaction caps may be introduced to ensure financial stability. The ECB is consulting with stakeholders to align the digital euro with the needs of the European economy, fostering trust in it as a secure and efficient payment method (Bindseil, 2020).

1.3. China's e-CNY Implementation and Its Implications for Foreign Trade

The People's Bank of China (PBoC) has developed the e-CNY, one of the most advanced central bank digital currency (CBDC) projects globally. The initiative began in 2014, and since 2019, it has been piloted in several cities (Mu, 2022). Today, e-CNY is utilized both in retail payments and, to a limited extent, in cross-border transactions, contributing strategically to China's financial system (BIS, 2021).

The main objectives of e-CNY include improving the efficiency of payment systems, reducing transaction costs, decreasing reliance on cash, and enhancing financial inclusion. Additionally, China aims to promote the use of the yuan in international trade and reduce dependence on the U.S. dollar (Reuters, 2025). The acceptance of e-CNY for in-store payments in Hong Kong exemplifies the regional expansion of this initiative (Reuters, 2024).

From a technical perspective, the e-CNY operates via a "two-tier system," where the People's Bank of China issues the digital currency to commercial banks, which then distribute it to end users. Its offline transaction feature, using technologies like NFC, enables payments in areas with limited internet access. Despite these capabilities, adoption has been slower than expected, as many users still prefer private sector platforms like WeChat Pay and Alipay due to their widespread use and convenience (Cornell, 2024).

In terms of foreign trade, the use of e-CNY in cross-border payments remains limited. Nevertheless, China plans to expand integration with the Cross-Border Interbank Payment System (CIPS), aiming to increase the role of the digital yuan in global trade (BIS, 2021). This development is particularly significant for countries such as Türkiye, where trade relations with China are substantial. For the Digital Turkish Lira (DTL), the e-CNY experience provides valuable lessons in technical infrastructure, financial inclusion, and internationalization strategies. Specifically, China's experience demonstrates the importance of fast payment systems, financial accessibility, and cross-border in-teroperability, all of which are highly relevant for integrating the DTL into foreign trade transactions.

1.4. Definition and History of the Digital Turkish Lira

The Digital Turkish Lira is being developed to both strengthen payment systems and adapt to the digital economy, amidst a decline in cash usage and the proliferation of digital payment methods. In developing this currency, the Central Bank of the Republic of Türkiye (CBRT) aims to increase the effectiveness of monetary policy, support financial inclusion, and encourage competition and innovation in payment infrastructure (Öztaban, 2016; Öztürk, 2018). The development of the Digital Turkish Lira begins at a time when central banks globally are accelerating their digital currency efforts. As part of these efforts, the CBRT, in collaboration with public institutions and private sector

stakeholders, is comprehensively evaluating the technical, legal, and economic aspects of digital currency technologies. The Digital Turkish Lira project is being planned in three phases: the first phase involves conceptual design and technology testing, and the second phase involves pilot applications (Öztürk, 2018:56).

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The Digital Turkish Lira project is planned in three phases: the first phase involves conceptual design and technology testing, while the second phase involves pilot implementation (Öztürk, 2018:56). The third phase aims to implement the digital currency at the national level, ensuring broad system integration and compliance with legal regulations. In this context, Küçükkıralı and Afşar (2022) evaluated the potential impact of the Central Bank's digital currency in Türkiye using a SWOT analysis. The study systematically outlines the strengths, weaknesses, opportunities, and threats of digital currency implementation. The Central Bank of the Republic of Türkiye (CBRT) launched its first pilot applications in 2022 and conducted trials on digital payment scenarios with select public institutions. These pilot studies provide significant feedback on the system's technical adequacy, transaction security, user experience, and integration with payment systems. At the same time, infrastructures for both online and offline use of the Digital Turkish Lira are being tested, aiming to ensure the uninterrupted operation and comprehensive structure of digital payment systems (Öztürk and Sandalcılar, 2018).

1.5. Integration of the Digital Turkish Lira into the Financial System

The integration of the Digital Turkish Lira into the financial system is considered a critical milestone in Türkiye's digitalization process. This next-generation payment instrument, developed by the Central Bank of the Republic of Türkiye (CBRT), is being designed to be compatible with existing financial infrastructure and to offer innovative contributions to the system's operation. The integration of the Digital Turkish Lira into the financial system is taking shape not only as a technical process but also as a multi-layered transformation encompassing economic, legal, and institutional dimensions (Savaşgümrük and Danacı, 2014:89). The primary goal in this process is to ensure that digital currency operates in harmony with the banking system, payment infrastructures, monetary policy mechanisms, and user habits, ensuring the sustainability of the digital economy. While integrating the Digital Turkish Lira into existing payment systems, the CBRT is working to develop a structure compatible with currently used EFT, FAST, and other interbank payment systems (Salihoğlu, 2018; Savaşgümrük and Danacı, 2014).

2. METHODOLOGY

This research examines the factors influencing the adoption of the Digital Turkish Lira (DTL) in foreign trade transactions, based on the Technology Acceptance Model and the Theory of Planned Behavior. In addition to key components such as perceived usefulness, perceived ease of use, attitude, intention, and behavior, the model also includes trust, security, and risk variables. An empirical

framework was developed using structural equation modeling to holistically assess the impacts of DTL adoption. This framework was tested with a survey measuring the perceptions of foreign trade and logistics professionals. Causal relationships in the model were analyzed using Partial Least Squares-Structural Equation Modeling (LSM-SEM). Although inspired by studies in the literature, the research model offers an innovative framework for the application of digital currencies in foreign trade.

2.1. Population and Sample

The research population consists of professional experts operating in international trade and logistics in Türkiye. In this context, we targeted public and private sector employees directly or indirectly involved in payment systems and digital currencies in foreign trade transactions. The sample was selected from this population using a purposive sampling method and consisted of participants with knowledge and professional experience in digital technologies. Participants were selected based on the criteria of having at least three years of industry experience and operating in foreign trade or logistics. The sample group was recruited through an online survey, and data from a total of 451 participants were included in the analysis. This sample size met the minimum sample size required for structural equation modeling and ensured model validity.

2.2. Analysis of Data

Structural Equation Modeling (SEM) based on the Partial Least Squares Method (PLS-SEM) was used to analyze the data obtained in the study. The analyses were conducted using Smart PLS 4 software. First, the validity and reliability of the measurement model were assessed, and construct validity was tested using confirmatory factor analysis. The internal consistency of the constructs was determined using composite reliability and Cronbach's Alpha coefficients. Subsequently, the model's external loadings, average variance explained (AVE), and discriminant validity values were calculated. Following these verification steps, the structural model was tested. Within the scope of hypothesis testing, path coefficients, t-values, and p-values were examined, and the level of statistical significance was assessed according to the 95% confidence interval. The results were compared and interpreted with previous studies in the literature. Thus, the structural relationships of the factors affecting the adoption of DTL in foreign trade transactions were revealed.

2.3. Findings

Table 1. *Descriptive Statistics of Participants*

Education	**f**	**%**	**Age**	**f**	**%**
Associate Degree	71	15.7	18-21	220	48.8
Bachelor's Degree	326	72.3	21-29	216	47.9
Master's Degree	42	9.3	30-39	9	2
High School	12	2.7	40-49	2	0.4
			50-59	3	0.7
			60 and over	1	0.2
Total	**451**	**100**	**Total**	**451**	**100**

Of the 451 participants, 72.3% have a bachelor's degree. This is followed by associate degree holders at 15.7%. The proportion of participants with a master's degree or higher is 9.3%, and the proportion with a high school degree is 2.7%. This distribution indicates that the majority of participants have a

higher education level. The age distribution reveals that the majority of participants are young individuals. Specifically, 48.8% are between the ages of 18 and 21, followed by the 21-29 age group at 47.9%. This suggests that young people's opinions are prioritized in the evaluation of innovative payment systems like the Digital Turkish Lira, and that awareness of these systems may be high among the young population. The participation of older age groups is quite limited probably due to older ones often see little value or heightened risks in digital currencies. This suggests that the study sample is predominantly comprised of young and educated individuals, thus supporting the conclusion that the findings have greater generalizability to this demographic group.

Table 2. *Factor Loadings, AVE, CR, and Cronbach's Alpha Values*

Construct	Item	Factor Loadings	Cronbach's Alpha	CR	AVE
Perceived Behavioral Control	**PBC1**	0.860	0.823	0.894	0.739
	PBC2	0.863			
	PBC3	0.855			
Perceived Benefit	**PB1**	0.866	0.880	0.917	0.735
	PB2	0.876			
	PB3	0.832			
	PB4	0.854			
Perceived Confidence	**PC1**	0.882	0.906	0.931	0.731
	PC2	0.911			
	PC3	0.900			
	PC4	0.858			
	PC5	0.710			
Perceived Ease of Use	**PEU1**	0.872	0.916	0.941	0.799
	PEU2	0.905			
	PEU3	0.896			
	PEU4	0.903			
Perceived Compatibility	**PC1**	0.900	0.873	0.922	0.797
	PC2	0.912			
	PC3	0.867			
Behavioral Attitude	**BA1**	0.876	0.868	0.919	0.791
	BA2	0.905			
	BA3	0.887			
Intent	**I1**	0.894	0.866	0.918	0.789
	I2	0.886			
	I3	0.885			
Risk	**R1**	0.867	0.880	0.926	0.806
	R2	0.931			
	R3	0.895			
Subjective Norm	**SN1**	0.844	0.815	0.890	0.730
	SN2	0.851			
	SN3	0.869			

Table 2 presents the structural validity and reliability analyses of the survey-based study. Factor loadings for all variables examined here ranged between 0.710 and 0.931. These values demonstrate that all indicators are highly correlated with their factors and are sufficient to represent the measured

concepts. Cronbach's alpha values are above 0.80 for all variables, indicating a high level of internal consistency for the survey. In particular, variables such as "Perceived Ease of Use" (α=0.916), "Perceived Trust" (α=0.906), and "Behavioral Attitude" (α=0.868) demonstrate high reliability. Composite Reliability (CR) values are above 0.890 for all constructs, and these values exceed the 0.70 threshold, supporting the structural consistency of the scales. Average Variance Explanation (AVE) values are above 0.70 for all variables. This shows that each construct is adequately explained by its own indicators and convergent validity is achieved.

Table 3. *Discriminant Validity (Fornell-Larcker Criterion)*

Variable	PBC	PC	PEU	PC	BA	I	R	SN
PBC	0.859							
PB	0.783							
PC	0.563	0.855						
PEU	0.754	0.555	0.894					
PC	0.604	0.669	0.589	0.893				
BA	0.722	0.612	0.665	0.605	0.889			
I	0.738	0.675	0.643	0.668	0.761	0.888		
R	0.494	0.671	0.525	0.529	0.548	0.609	0.898	
SN	0.734	0.639	0.686	0.649	0.778	0.762	0.596	0.855

Table 3 was organized according to the Fornell-Larcker criterion to analyze the correlations and validity levels between variables. In this analysis, each variable is expected to reflect its own construct validity; therefore, the square root of the Avenin value for each variable should be higher than the other variables with which it is cross-correlated.

According to the table, the square root of the AVE value for all variables is higher than the correlations of that variable with other variables. For example, the internal value of the variable "Perceived Behavioral Control" (PBC) is 0.859, while its correlations with other variables are below this value. The same applies to the other variables. This value was calculated as 0.855 for "Perceived Trust" (PT), 0.894 for "Perceived Ease of Use" (PE), 0.893 for "Perceived Compatibility" (PC), 0.889 for "Behavioral Attitude" (BE), 0.888 for "Intention" (N), 0.898 for "Risk" (R), and 0.855 for "Subjective Norm" (SNR).

These data indicate that each variable has sufficient discriminatory power to represent its own dimension and that the model is based on a strong foundation in terms of structural validity. As suggested in the literature, the fact that the Fornell-Larcker criterion was met reveals that the measurement model has convergent and divergent validity (Hair et al., 2021).

In this context, it is understood that the scales used in the study are conceptually independent of overlap and consistent.

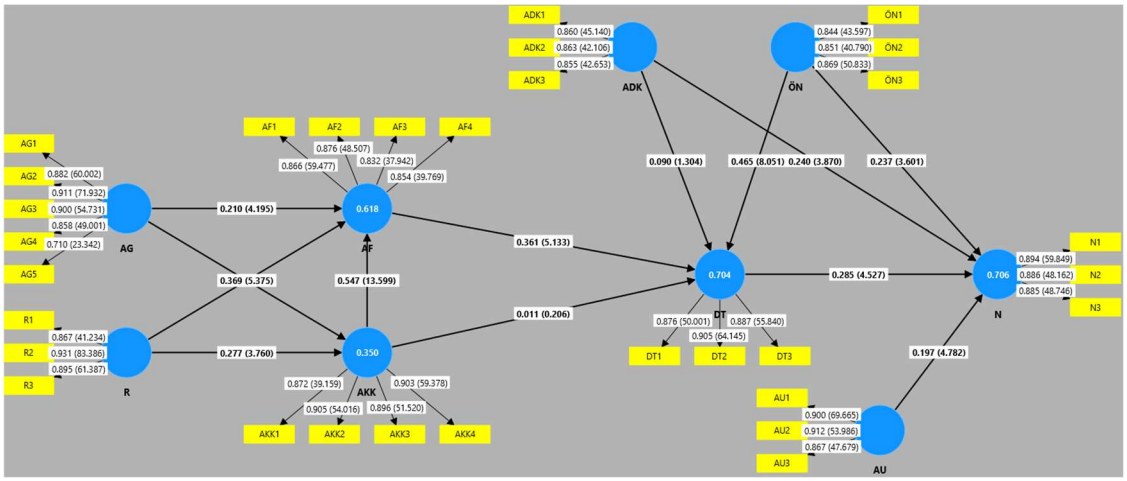

Figure 1. *Path Analysis of the Research Model*

The structural equation model presented in the figure reflects an integrated framework that tests the validity of the hypotheses developed in line with the theoretical framework of the study. An examination of the path relationships in the model shows that the variable "Perceived Trust (PT)" has a positive and significant effect on both "Perceived Benefit (PB)" (β = 0.210, t = 4.195) and "Perceived Ease of Use (PEU)" (β = 0.369, t = 5.375). This finding demonstrates that trust is a central determinant in innovative payment systems such as the Digital Turkish Lira, directly influencing users' perceptions of both usefulness and ease of use. Similarly, the "Risk (R)" variable was found to have a significant effect on both "Perceived Benefit" (β = 0.147, t = 2.957) and "Perceived Ease of Use" (β = 0.277, t = 3.760). Among all relationships, "Perceived Ease of Use" exerted the strongest effect on "Perceived Benefit" (β = 0.547, t = 13.599), revealing that—consistent with technology acceptance models—the ease of use significantly enhances the perceived usefulness of the system.

Table 4. Structural Model Outputs

Hypothesis	Relation	Path Coefficients	t-score	p-value	Is the hypothesis supported?
H1	**PB -> PC**	0.210	4.195	0.000	Yes
H2	**PB -> PEU**	0.369	5.375	0.000	Yes
H3	**R -> PB**	0.147	2.957	0.003	Yes
H4	**R -> PEU**	0.277	3.760	0.000	Yes
H5	**PEU -> PB**	0.547	13.599	0.000	Yes
H6	**PB -> BA**	0.361	5.133	0.000	Yes
H7	**PEU -> BA**	0.011	0.206	0.837	No
H8	**PBC -> BA**	0.090	1.304	0.193	No
H9	**PBC -> I**	0.240	3.870	0.000	Yes
H10	**SN -> BA**	0.465	8.051	0.000	Yes
H11	**SN -> I**	0.237	3.601	0.000	Yes
H12	**DT -> I**	0.285	4.527	0.000	Yes
H13	**PC -> I**	0.197	4.782	0.000	Yes

Note: p < .05

Table 4 presents the findings of the structural model hypothesis tests and reveals the direct effects between the variables in the model. A total of thirteen hypotheses were tested within this scope, and eleven of these were found to be statistically significant, while two hypotheses were not supported. An examination of the t-values and p-values used in the hypothesis testing reveals that the significance level was set at $p < 0.05$.

Based on this threshold value, for example, within the framework of hypothesis H1, the effect of Perceived Trust on Perceived Usefulness was found to be positive and significant ($\beta = 0.210$, $t = 4.195$, $p = 0.000$). Similarly, within the framework of hypothesis H2, Perceived Trust also has a significant effect on Perceived Ease of Use ($\beta = 0.369$, $t = 5.375$, $p = 0.000$). These findings indicate that the level of trust is a determining factor in both ease of use and perceived usefulness.

Significant relationships were also identified regarding the risk variable. In hypothesis H3, the effect of Risk on Perceived Usefulness ($\beta = 0.147$, $t = 2.957$, $p = 0.003$), and in hypothesis H4, the effect of Risk on Perceived Ease of Use ($\beta = 0.277$, $t = 3.760$, $p = 0.000$) were found to be significant. This indicates that users' risk perceptions towards digital payment systems affect both the usage experience and benefit expectations.

In hypothesis H5, the effect of Perceived Ease of Use on Perceived Usefulness was determined with a very high coefficient ($\beta = 0.547$, $t = 13.599$, $p = 0.000$). This finding is also consistent with technology acceptance models because ease of use is a key factor in individuals' finding technological tools useful.

When the variables affecting behavioral attitudes were examined, the effect of Perceived Usefulness on Behavioral Attitude was found significant in hypothesis H6 ($\beta = 0.361$, $t = 5.133$, $p = 0.000$), while the effect of Perceived Ease of Use on Behavioral Attitude was found insignificant in hypothesis H7 ($\beta = 0.011$, $t = 0.206$, $p = 0.837$). Similarly, the effect of Perceived Behavioral Control on Behavioral Attitude within the scope of hypothesis H8 was not statistically significant ($\beta = 0.090$, $t = 1.304$, $p = 0.193$).

The failure to support these two hypotheses reveals that perceived usefulness and social influences, rather than ease of use and perceived control, are more decisive in the formation of behavioral attitudes.

With hypothesis H9, the effect of Perceived Behavioral Control on Intention was found to be significant ($\beta = 0.240$, $t = 3.870$, $p = 0.000$), indicating that individuals' perception of control influences their intention to use digital payment systems.

In line with hypotheses H10 and H11, Subjective Norms were found to have positive and significant effects on both Behavioral Attitude ($\beta = 0.465$, $t = 8.051$, $p = 0.000$) and Intention ($\beta = 0.237$, $t = 3.601$, $p = 0.000$). These findings suggest that individuals tend to gravitate towards technological innovations such as the Digital Turkish Lira due to the influence of their social environment.

Finally, the effect of Behavioral Attitude on Intention in hypothesis H12 ($\beta = 0.285$, $t = 4.527$, $p = 0.000$) and the effect of Perceived Compatibility on Intention in hypothesis H13 ($\beta = 0.197$, $t = 4.782$, $p = 0.000$) were found to be statistically significant.

Although the majority of the proposed relationships were confirmed, two hypotheses—H7 and H8—were not supported. Specifically, the effect of Perceived Ease of Use on Behavioral Attitude (H7) did

not reach statistical significance, indicating that while ease of use enhances perceptions of usefulness, it does not directly shape favorable attitudes toward adopting the Digital Turkish Lira.

Similarly, the effect of Perceived Behavioral Control on Behavioral Attitude (H8) was insignificant, suggesting that individuals' sense of control over using digital currencies is not, in itself, sufficient to shape their attitudes.

These results emphasize that perceived usefulness and social influences are more decisive than ease of use or perceived control in the formation of positive behavioral attitudes toward innovative payment technologies.

3. CONCLUSION

This study investigates the potential applications and impacts of the Digital Turkish Lira (DTL) in the context of foreign trade, highlighting the strategic opportunities emerging for Türkiye amid the expanding role of digital currencies in global commerce. For this purpose, the study provides a comprehensive analysis of both traditional and modern payment methods in foreign trade, with a particular focus on the potential integration of the DTL—developed by the Central Bank of the Republic of Türkiye—into international transactions.

By grounding the research in the Technology Acceptance Model (TAM) and the Theory of Planned Behavior (TPB), the study sought to reveal the determinants of DTL adoption among professionals in foreign trade and logistics. The empirical findings, based on a survey of 451 participants—predominantly young and highly educated experts—offer valuable insights into the dynamics of digital payment adoption.

The application of Partial Least Squares–Structural Equation Modeling (PLS-SEM) demonstrated strong measurement reliability and validity, with factor loadings ranging from 0.710 to 0.931 and Cronbach's alpha values above 0.80 for all constructs. Convergent and discriminant validity tests further confirmed the robustness of the model, ensuring that each construct was conceptually distinct and statistically reliable. Out of thirteen hypotheses tested, eleven were supported, underscoring the explanatory strength of the model.

The results revealed that Perceived Trust exerts a significant positive influence on both Perceived Usefulness ($\beta = 0.210$, $t = 4.195$) and Perceived Ease of Use ($\beta = 0.369$, $t = 5.375$), confirming that trust is a critical determinant in the acceptance of innovative digital currencies. Similarly, Risk was found to significantly affect both perceived usefulness and ease of use, suggesting that risk perceptions play a dual role by shaping user expectations regarding benefits and usability.

Nonetheless, the explained variance for Intention reached a high level of 70.6%, indicating that positive drivers such as trust, usefulness, and compatibility are strong enough to outweigh risk concerns. In line with technology acceptance theories, Perceived Ease of Use emerged as the most powerful predictor of perceived usefulness ($\beta = 0.547$, $t = 13.599$). Furthermore, Subjective Norms were shown to significantly influence both attitudes and intentions, highlighting the social dimension of digital payment adoption in foreign trade.

From a theoretical perspective, these findings contribute to the literature by empirically validating the relevance of TAM and TPB in the context of CBDCs and by demonstrating how constructs such as trust, risk, and social influence interact to shape adoption behavior.

Practically, the results underscore that traditional instruments—such as cash against documents, cash against goods, and letters of credit—while historically central to trade, face limitations including high operational costs, long transaction times, and trust deficits between parties. The adoption of the DTL, designed on blockchain infrastructure with potential integration into global CBDC ecosystems, can address these shortcomings by providing greater transparency, faster settlements, and enhanced trust in cross-border trade.

Overall, this research indicates that the DTL is not merely a technological innovation, but also a strategic instrument that can reshape Türkiye's position in the rapidly digitizing global economy. By reducing transaction costs, increasing efficiency, and strengthening commercial trust, the DTL has the potential to provide Turkish exporters with a competitive advantage in international markets. However, its successful integration requires a carefully designed legal and technical framework, strong public–private collaboration, and alignment with international payment systems.

Lessons drawn from China's e-CNY, which emphasizes technological infrastructure and cross-border interoperability, and the ECB's digital euro, which stresses legal safeguards and consumer protection, should guide Türkiye's path toward establishing a sustainable and internationally recognized digital currency.

Surveys on digital currencies frequently reveal significant participation disparities across age groups, with younger individuals much more inclined to get involved than older adults. This pattern isn't coincidental; it stems from generational differences in technology familiarity, risk appetite, economic backgrounds, and trust in conventional financial systems. According to numerous surveys and research, younger people are attracted by the relevance and potential benefits of digital currencies, whereas older adults often perceive limited value or perceive greater risks.

In this study, the majority of survey participants were young individuals aged 18–29, with participation among older age groups remaining very limited. While these differences may reflect genuine generational variations, it is important to recognize this as a limitation of the research. To gain a more comprehensive understanding, future studies should aim to include a broader range of age groups, particularly older individuals.

It is believed that this study will contribute to the literature by examining the Digital Turkish Lira in the context of foreign trade through a country-specific analysis, emphasizing its capacity to reduce transaction costs, increase efficiency, and strengthen the participation of small and medium-sized enterprises (SMEs). Furthermore, by integrating discussions on blockchain-enabled security and transparency with strategic considerations such as reserve currency potential and regulatory constraints, the study advances existing CBDC scholarship with both practical implications and policy-oriented perspectives.

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