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Financial inclusion through gold pawn services in Indonesia: A comparative analysis of conventional and Islamic systems

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ABSTRACT

Background: Financial inclusion is essential for inclusive economic development, particularly in developing countries where access to formal financial services remains limited. In Indonesia, gold pawn services provided by non-bank financial institutions serve as an important alternative financing mechanism for communities facing barriers to banking access. These services operate under conventional and Islamic systems, yet comparative empirical evidence on their roles in promoting financial inclusion remains limited. This study aims to analyze the role of gold pawn services in enhancing financial inclusion in Indonesia, considering operational and macroeconomic factors, and to compare inclusion mechanisms between conventional and Islamic systems. **Methods:** This study employs a quantitative approach, drawing on secondary data on gold pawn services in Indonesia. Financial inclusion is proxied by the ratio of service outlets to gold pawn accounts, reflecting spatial and institutional accessibility. A stacked regression model is applied to examine the effects of operational factors and economic growth while capturing structural differences between the two systems. **Findings:** The results show that operational factors significantly influence financial inclusion in both conventional and Islamic gold pawn services. Economic growth also affects financial inclusion, with differing sensitivities observed between the two systems, indicating distinct operational and structural mechanisms. These findings support the theoretical view that alternative financing instruments with simplified access can complement the formal financial system in expanding financial inclusion. **Conclusion:** Gold pawn services contribute significantly to financial inclusion in Indonesia, with clear differences in the mechanisms of inclusion between conventional and Islamic systems. **Novelty/Originality of this article:** This study contributes by using the outlet-to-account ratio as a proxy for financial inclusion and by providing an integrated empirical comparison of conventional and Islamic gold pawn services.

KEYWORDS: conventional and Islamic finance; economic growth; financial inclusion; gold pawn services; operational factors.

1. Introduction

Financial inclusion is a strategic agenda in global and national economic development because it plays a crucial role in driving inclusive economic growth and improving public welfare. The concept of financial inclusion refers not only to account ownership at formal financial institutions but also to ease of access, affordability, service quality, and people's ability to use financial products and services sustainably (Zhu & Zhang, 2023). In the context of developing countries, financial inclusion is often framed as a policy instrument to bridge

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economic and social gaps, particularly for low-income groups, micro- and small-business owners, and communities in areas with limited financial infrastructure (Lamba & Gupta, 2025).

Indonesia, a developing country with a large population, faces complex challenges in expanding financial inclusion. Although the national financial inclusion rate has increased over the past decade, significant segments of society remain unbanked or underbanked. Limited financial literacy, unstable incomes, minimal formal asset ownership, and relatively stringent banking procedures are key barriers to accessing formal financial services (Sahputri et al., 2024). The Financial Services Authority/*Otoritas Jaksa Keuangan* (OJK) and Bank Indonesia have positioned financial inclusion as a crucial pillar of financial sector stability and deepening, including by strengthening the role of non-bank financial institutions that are more responsive to the needs of grassroots communities (Nurliana Sianturi et al., 2025).

In this context, the existence of alternative financial instruments is becoming increasingly relevant. One inclusive instrument that the Indonesian people have long used is pawn services, particularly gold pawning. Gold is a liquid asset with a relatively stable value and is readily accepted as collateral by financial institutions. For those who lack access to bank credit or do not meet administrative requirements, gold pawning provides a rapid, straightforward, and flexible short-term financing option (Rahmadanti & Sugiarti, 2024). Therefore, gold pawning services have significant potential to expand financial inclusion, both by meeting emergency consumption needs and by supporting micro-scale productive activities.

Globally, the World Bank emphasizes that access to simple, readily disbursed collateral-based financing is a crucial factor in expanding financial inclusion in developing countries (Dias Duarte et al., 2017). This type of financing scheme is considered effective in reaching marginalized groups excluded from the formal financial system. In practice, pawnshop services serve as a bridge between the formal financial sector and the community's real needs, particularly during periods of economic uncertainty (Kopylyuk et al., 2025).

In Indonesia, gold pawning services have developed through two main systems: conventional and sharia. Conventional gold pawning generally employs an interest-based lending mechanism. In contrast, sharia gold pawning operates according to Islamic financial principles, using rahn and ijarah contracts that emphasize the prohibition of usury, fairness, and transparency. Both systems provide alternative financing for people with diverse economic preferences and religious beliefs (Setiawan et al., 2023). In recent years, sharia gold pawning services have shown rapid growth, in line with increasing public awareness of sharia-compliant financial products (Nurmayanti & Irawan, 2025).

The rapid growth of Islamic gold pawn services in Indonesia reflects the growing importance of gold-based financing as an alternative mechanism to improve financial access for low- and middle-income communities. In ASEAN countries, including Indonesia and Malaysia, gold pawning has become a significant business sector that facilitates access to credit for individuals and small businesses (World Gold Council, 2025). In many developing economies, gold-based financing also plays an important role in supporting financial stability and economic resilience, particularly among underserved and marginalized communities with limited access to formal banking services (World Gold Council, 2025). Previous studies further show that ar-rahn financing is frequently utilized not only for emergency consumption needs but also for productive purposes such as business expansion and income-generating activities (Razak & Asutay, 2022)

From a business strategy perspective, the expansion of Islamic gold pawn services indicates a growing effort by pawn institutions to strengthen customer outreach, accessibility, and public trust in the non-bank financial services industry. In addition, the development of digital gold platforms and sharia-compliant financial services also demonstrates how gold-based financing is increasingly integrated with financial service innovation and broader market expansion strategies (World Gold Council, 2025). Consequently, Islamic gold pawn services have evolved beyond conventional short-term, collateral-based financing and have become part of financial institutions' competitive strategies to reach underserved communities and expand inclusive financial markets.

The development of gold pawn services in Indonesia is reflected in the increasing number of accounts, transaction turnover, and the expansion of outlet networks for both conventional and Sharia systems. Although the absolute number of accounts and turnover of the conventional system still dominate, the Sharia gold pawn system shows a relatively more dynamic growth trend. This indicates that the public is increasingly accepting Sharia-based financing mechanisms and that they have the potential to play a significant role in the national financial inclusion strategy.

However, the effectiveness of gold pawn services in promoting financial inclusion is determined not only by the institution's internal factors but also by macroeconomic conditions. Changes in Gross Domestic Product (GDP) and national economic dynamics can influence demand for pawn services (Ofosu Mensah Ababio et al., 2024). During periods of economic slowdown or increased household financial pressure, gold pawn services are often used as a coping mechanism. Conversely, under more stable economic conditions, pawn services can serve as an alternative source of financing for the development of micro- and small-sized businesses (Dewi et al., 2025).

Several previous studies have provided empirical and theoretical foundations for the relationship between financial systems, pawn services, and financial inclusion. Baber (2019) showed that countries with Islamic financial systems tend to have higher levels of financial inclusion compared to countries dominated by conventional financial systems, particularly in terms of women's financial empowerment. This finding indicates that the characteristics of a Sharia-based financial system can enable broader and more equitable mechanisms of inclusion.

More specifically, Razak & Asutay (2022) found that financial inclusion through Islamic pawning services (*ar-rahn*) significantly improved clients' economic well-being in Malaysia. The study used primary data analyzed using structural equation modeling, providing strong empirical evidence regarding the role of Islamic pawning in supporting economic well-being. These findings strengthen the argument that Islamic gold pawning serves not only as a short-term financing instrument but also has broader socio-economic implications.

Other studies highlight the importance of operational factors in the use of Islamic pawn services. Azman et al. (2018) identified service costs as a key factor influencing women micro-entrepreneurs' decisions to use ar-rahn services—meanwhile, Thaker et al. (2021) showed that social factors and risk perception positively influenced the acceptance of ar-rahn services, while affective factors negatively influenced them. These findings confirm that the operational design of pawn services, including cost structure and risk perception, plays a crucial role in determining the level of financial inclusion.

In the Indonesian context, Wijaya (2022) discusses the development and challenges of Islamic pawnshops from a legal and institutional perspective. The study demonstrates that Islamic pawnshops play a strategic role in providing Islamic financial services and in expanding financial access. However, the qualitative descriptive approach used does not provide quantitative evidence regarding the impact of pawnshop services on financial inclusion or a direct comparison with conventional pawnshop systems. This suggests that there is room for further empirical and comparative research. Meanwhile, Ali et al. (2020) examined the determinants of Islamic financial inclusion in Indonesia from the demand and supply sides using an Analytic Network Process approach based on expert opinion. While providing important conceptual insights, the study did not specifically examine gold pawning services or use quantitative empirical data; thus, limitations in generalizability remain a concern.

Based on the literature review, it can be concluded that although evidence demonstrates the potential of Sharia-based financial services, including Sharia pawnshops, to promote financial inclusion, several limitations remain in prior research. First, most studies focus on a single system, specifically Sharia, without conducting direct comparisons with conventional systems. Second, research integrating pawnshop operational factors with macroeconomic variables remains relatively limited. Third, the use of alternative and measurable indicators of financial inclusion, such as the service affordability ratio, has not been widely explored.

Therefore, this study offers two original contributions to the study of financial inclusion in Indonesia. First, it uses the ratio of outlets to gold pawn accounts as a proxy for financial inclusion, reflecting service affordability at both the spatial and institutional levels. Second, it empirically compares the mechanisms of financial inclusion between conventional and sharia-compliant gold pawn services, emphasizing the roles of operational factors and macroeconomic conditions, particularly economic growth.

In line with these objectives, this study was designed as a quantitative empirical study using secondary data. The analysis examined the influence of operational and macroeconomic factors on financial inclusion indicators across both gold pawning systems. Thus, this study is expected to explain differences in the mechanisms and effectiveness of financial inclusion between conventional and sharia-compliant gold pawning, and to provide policy implications for regulators and industry players in designing strategies to develop more inclusive and sustainable gold pawning services.

2. Methods

This study employs a quantitative comparative design to analyze the role of gold pawn services in promoting financial inclusion in Indonesia, comparing the conventional and sharia systems. This study uses annual time-series secondary data from official PT Pegadaian reports, the Financial Services Authority/*Otoritas Jaksa Keuangan* (OJK) publications, and macroeconomic data from the Central Statistics Agency/*Badan Pusat Statistik* (BPS). The data are compiled at the national level and are separated between conventional and Sharia systems.

The dependent variable is the number of gold pawn accounts, used as a proxy for financial inclusion, and is transformed to the natural logarithm. Independent variables include gold pawn turnover, the ratio of outlets to accounts as an indicator of accessibility, and transaction growth. This study also includes economic growth as a macroeconomic control variable and a COVID-19 dummy variable to capture the pandemic's structural impact. The study period covers 2018–2024 (7 observations), thus demonstrating the dynamics of financial inclusion before and during the COVID-19 pandemic. To enable comparative analysis within a single estimation framework, the data are compiled into a stacked dataset, yielding 14 observations.

This study applies stacked regression analysis, which enables the estimation of multiple group-specific relationships within a single model and allows for direct testing of structural differences through interaction terms (Breiman, 1996). By pooling the conventional and sharia datasets and introducing interaction variables between system dummies and key predictors, the model captures differential effects of turnover, outlet ratio, and transaction growth on financial inclusion across the two systems. The use of the Wald test to assess the joint significance of these interaction coefficients is a key strength of the approach, as it provides a formal statistical mechanism for evaluating whether the estimated relationships differ systematically between the two groups (Oberfichtner & Tauchmann, 2021; Wooldridge, 2002). However, the relatively small sample size constitutes an important limitation that should be acknowledged. With only 14 stacked observations, the estimation results may be sensitive to outliers, exhibit limited statistical power, and constrain the generalizability of the findings. Therefore, the results should be interpreted with caution, and future research is encouraged to employ longer time horizons or more granular data to enhance robustness.

3. Results and Discussion

3.1 Result

3.1.1 Characteristics of gold pawn data

Gold pawn is characterized as a micro-based financial service, as reflected in differences in account numbers, outlet network density, turnover dynamics, and transaction growth volatility across both conventional and Sharia pawn systems. The number of accounts and outlet ratio variables reflect the structural dimensions and service reach, while turnover and transaction growth represent the intensity of service utilization over time. The following describes the characteristics of each variable.

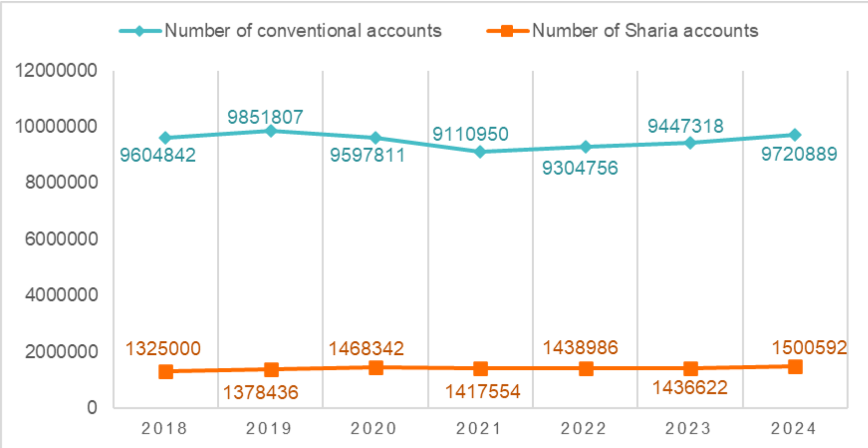

Fig. 1. Development of the number of conventional and sharia-based gold pawn accounts

Figure 1 shows the trend in the number of gold pawn accounts in the conventional and Sharia-based systems from 2018 to 2024. In general, the number of conventional accounts remained significantly higher than that in the Sharia-based system throughout the period. The number of conventional accounts fluctuated between approximately 9.1 and 9.9 million, with a relative decline in 2021–2022, followed by a rebound to approximately 9.72 million in 2024. This pattern indicates a stable customer base with relatively moderate annual variation. In contrast, the number of Sharia-based gold pawn accounts is smaller, at approximately 1.32–1.50 million. However, the trend is generally upward over the long term, with smaller fluctuations than in the conventional system. The gap between the two systems appears consistent throughout the observation period, indicating structural differences in operational scale and user base.

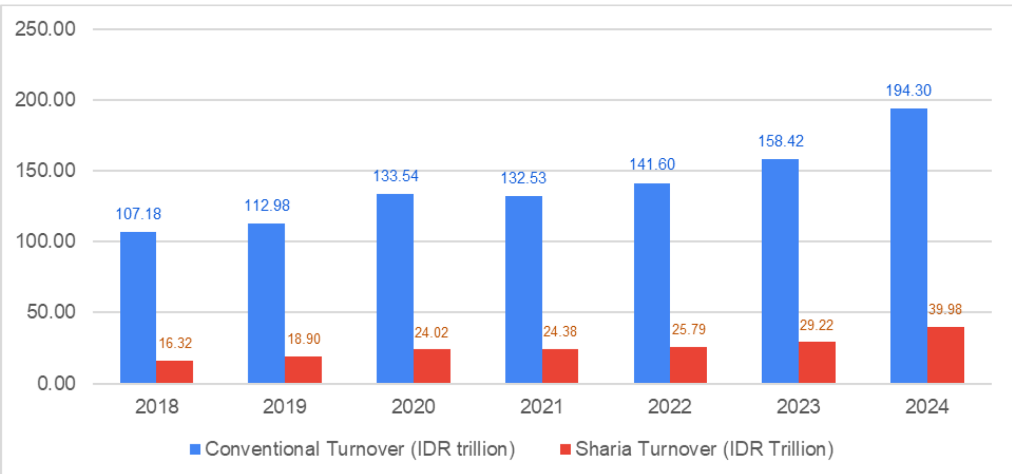

Fig. 2. Development of conventional and sharia gold pawn turnover

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Figure 2 shows the development of gold pawn turnover under the conventional and Sharia systems over the study period. Conventional system turnover shows a consistent upward trend, rising from approximately 107 trillion rupiah in 2018 to approximately 194 trillion rupiah in 2024. Despite slight slowdowns in certain years, the overall pattern is upward and relatively stable, indicating continued nominal growth. Sharia gold pawn turnover also shows an upward trend, albeit at a lower level than the conventional system. Sharia gold pawn turnover increased from approximately 16.32 trillion rupiah in 2018 to approximately 39.98 trillion rupiah in 2024. Descriptive statistics show that both systems exhibit similar growth trends, but at very different scales.

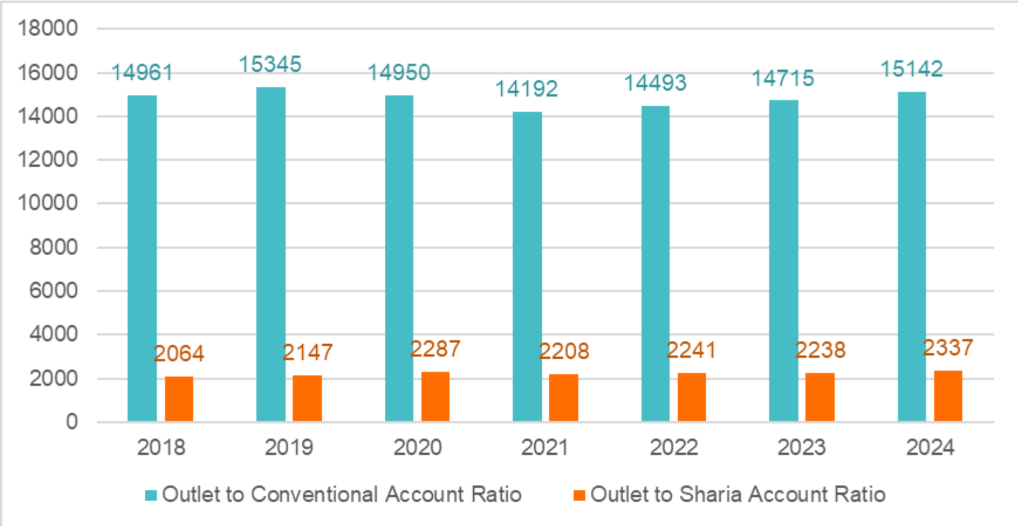

Fig. 3. Outlet-to-account ratio for conventional and sharia systems

Figure 3 shows the outlet-to-account ratio in the conventional and Sharia systems. In the conventional system, the outlet-to-account ratio ranges from 14,192 to 15,345, with relatively little year-to-year variation. This pattern indicates that the outlet ratio in the conventional system is stable, without extreme spikes, suggesting a mature and established network structure. By contrast, the outlet-to-account ratio in the Sharia system is much lower, around 2,064 to 2,337, and shows a gradual upward trend over time. The difference in the ratio scale between the two systems is clearly visible, both visually and numerically, indicating differences in network efficiency or the system's stage of development. This pattern provides an early indication that the role of outlets in reaching accounts may differ between the conventional and Sharia systems.

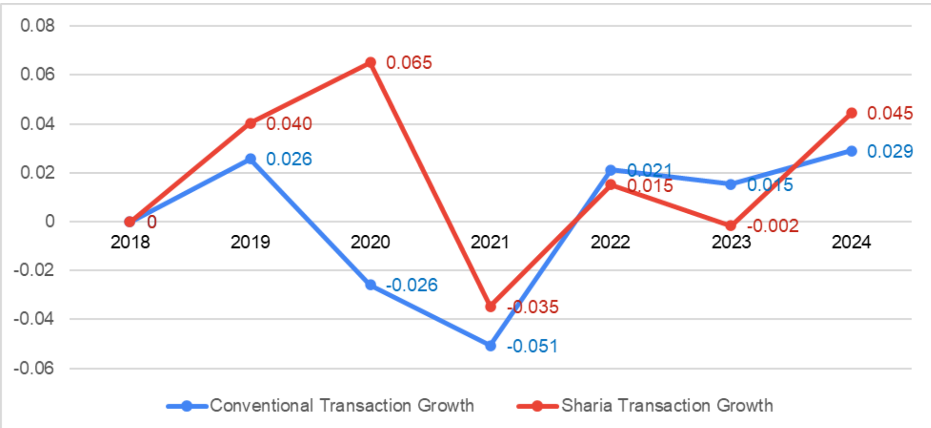

Fig 4. Growth in conventional and sharia gold pawn transactions

Figure 4 illustrates the growth in gold pawn transactions in the conventional and Sharia systems over the observation period. In the conventional system, the transaction growth rate ranged from -0.008 to 0.227. Growth rose from 0 in 2018 to 0.054 in 2019, reached a temporary peak of 0.182 in 2020, and then contracted in 2021. After this period, transaction growth resumed and gradually increased, reaching 0.227 in 2024. This pattern indicates that transaction growth in the conventional system is relatively moderate and gradual, with less pronounced year-to-year fluctuations. In contrast, transaction growth in the Sharia gold pawn system is more volatile, with a wider range of values from 0.015 to 0.368. After a sharp increase in 2019 (0.158) and a peak in 2020 (0.271), Sharia transaction growth declined significantly in 2021. However, over the subsequent period, the Sharia system showed a stronger recovery than the conventional system, with growth rising to 0.133 in 2023 and increasing sharply to 0.368 in 2024. This difference in volatility indicates that although the direction of transaction growth between the two systems is roughly parallel, the Sharia system is more sensitive to growth than the conventional system.

3.1.2 Stacked regression analysis results

Based on these characteristics, the subsequent analysis examined whether the effects of turnover growth, outlet-to-account ratio, and transaction growth on the number of accounts differed between conventional and sharia gold pawn systems. Macroeconomic factors, including economic growth and a COVID-19 dummy, were controlled for. To this end, a stacked regression approach was used, combining the two systems within a single estimation framework by incorporating interactions between the account-type dummy variable and the main variables. This approach enables identification of structural differences in financial inclusion mechanisms between conventional and sharia gold pawn systems, as indicated by the simultaneous estimation results.

The stacked regression estimation results in Table 1 indicate statistically significant structural differences between the conventional and Sharia gold pawn systems, primarily reflected in the baseline number of accounts and the outlet response ratio. The intercept coefficient of 15.07, with a *t-value* of 599.451 (*p-value* of 0.000), represents the baseline value of the number of gold pawn accounts in the conventional system. This value serves as the statistical reference point for all other coefficients in the model. The Sharia dummy coefficient of -1.95, with a *t-value* of -45.246 (*p-value* = 0.000), indicates a statistically significant difference between the Sharia and conventional systems. Statistically, these results indicate that the primary difference between the two systems lies in the model constant rather than solely in the slope of the relationship between the independent variables. This coefficient does not represent a causal negative effect; rather, it reflects a structural difference in the number of accounts. The Turnover variable has a coefficient of -9.13 x 10^{-6} (*p-value* = 0.836), indicating no statistically significant linear relationship between turnover and the number of accounts in the conventional system. Furthermore, the Sharia × Turnover interaction term is not statistically significant, with a coefficient of -1.40 × 10^{-4} (*p-value* = 0.344). Statistically, these two results indicate that the slope of the turnover variable with respect to the number of accounts is relatively uniform and weak across both systems.

Table 1. Parameter test results in stacked regression analysis

Coefficients	Estimate	Std. Error	*t-value*	*p-value*
Intercept	15.07	0.025150	599.451	0.000*
Sharia	-1.95	0.043070	-45.246	0.000*
Turnover	-9.13 x 10^{-6}	0.000041	-0.221	0.836
Ratio_Outlet	6.71 x 10^{-5}	0.000002	43.856	0.000*
Transaction_Growth	4.86 x 10^{-3}	0.016800	0.289	0.787
Economic_Growth	-1.91 x 10^{-6}	0.000376	-0.005	0.996
Covid	-4.08 x 10^{-4}	0.001282	-0.318	0.767
Sharia: Turnover	-1.40 x 10^{-4}	0.000130	-1.073	0.344
Sharia: Ratio_Outlet	4.05 x 10^{-4}	0.000013	31.878	0.000*
Sharia: Transaction_Growth	-9.45 x 10^{-3}	0.014270	-0.663	0.544

** significant at $\alpha = 0.05$

The most prominent statistical pattern was found in the Ratio_Outlet variable. The coefficient of the outlet ratio in the conventional system is 6.71×10^{-5} (*p-value* = 0.000), indicating a statistically strong positive relationship. Meanwhile, the coefficient of the Sharia x Ratio_Outlet interaction is positive at 4.05×10^{-4} (*p-value* = 0.000). Statistically, the outlet-to-account ratio variable, both conventional and sharia, has a significant influence on the number of accounts, which in turn influences financial inclusion. The Transaction_Growth variable showed a coefficient of 4.86×10^{-3} (*p-value* = 0.787) in the conventional system, indicating no statistically significant effect. The Sharia x Growth interaction was also insignificant, with a coefficient of -9.45×10^{-3} (*p-value* = 0.544). Inferentially, these results indicate that transaction growth is not strongly linearly related to variations in the number of accounts, and this pattern is consistent across both systems.

The control variables for economic growth and COVID-19 were not statistically significant, and macroeconomic fluctuations and the pandemic period did not meaningfully contribute to variation in the number of gold pawn accounts in this model framework. Statistically, this suggests that internal structural factors better explain variation in the data than external macro-level factors. Overall, the stacked regression estimates indicate that differences between systems are not universal but rather concentrated in certain parameters, particularly the outlet ratio. Other variables showed small, statistically insignificant coefficients, indicating similar relationship structures across most mechanisms determining the number of accounts in the conventional and Sharia gold pawn systems.

3.1.3 Wald test results

Testing for differences in coefficients between systems was conducted using the Wald test on the interaction term between the sharia dummy and the main variable. This test was used to evaluate whether the slope of the relationship between the explanatory variable and the number of accounts differed significantly between the conventional and sharia gold pawn systems within the same estimation framework. For the Turnover variable, the Wald test yielded an F value of 0.8534 with a *p-value* of 0.408, indicating that the null hypothesis of equality of coefficients cannot be rejected. Statistically, this result indicates no significant difference between the effect of turnover on the number of accounts in the conventional and Sharia systems. In other words, turnover variations exhibit a similar slope across both systems, and differences between systems do not significantly moderate this relationship.

Table 2. Wald test results for each variable

Variable	F-value	*p-value*
Turnover	0.8534	0.408
Ratio_Outlet	806.83	0.000*
Transaction_Growth	0.6092	0.479

** significant at $\alpha = 0.05$

The same test for the Ratio_Outlet variable yielded an F-value of 806.83 and a *p-value* of 0.000, indicating very strong statistical significance. Inferentially, these results provide strong evidence that the outlet ratio coefficients differ in structure between the conventional and Sharia gold pawn systems. The very large value of the test statistic indicates that this difference is not attributable to random sampling fluctuations but rather reflects systematic differences in the model parameters. From a statistical perspective, the significance of the Wald test on the outlet ratio indicates slope heterogeneity that cannot be ignored in a comparative analysis. This means that the response of the number of accounts to changes in the outlet ratio is not homogeneous across systems. These results also demonstrate that stacked regression successfully identifies specific parameter differences rather than general differences across all variables, thereby improving inference accuracy relative to separate regression approaches.

Conversely, the Wald test for the transaction growth variable yielded an F-value of 0.6092 (p = 0.479), which exceeds the significance level. These results provide insufficient evidence to support a difference in the effect of transaction growth on the number of accounts between the conventional and Sharia systems. Overall, the Wald test results indicate that structural differences between systems are not comprehensive but rather selective with respect to certain variables. Of the three main variables tested, only the outlet ratio showed a statistically significant difference in coefficients, whereas turnover and transaction growth showed parameter similarities across systems. A summary of the Wald test results indicates that the relationship mechanism based on turnover and transaction growth is parameter-invariant across systems. In contrast, the mechanism based on the outlet ratio exhibits significant heterogeneity in parameters.

3.2 Discussion

3.2.1 The role of gold pawn services in promoting financial inclusion in Indonesia

In line with the first objective of this study, this section analyzes how operational and macroeconomic factors affect financial inclusion as proxied by the number of gold pawn accounts. The estimation results show that, among the variables tested, only the ratio of outlets to accounts was significant, although its effect differed between conventional and sharia systems. Meanwhile, turnover, transaction growth, economic growth, and the COVID-19 dummy variable were not statistically significant.

These findings carry significant geoeconomic and strategic implications. Indonesia's archipelagic geography, comprising over 17,000 islands with highly uneven economic development across its regions, means that the spatial distribution of financial service infrastructure is not merely an operational consideration but a structural determinant of inclusion outcomes. The significance of the outlet-to-account ratio reinforces this reality: financial inclusion through gold pawnbroking is fundamentally a function of physical accessibility, and in Indonesia's context, accessibility is inseparable from geographic reach and regional economic heterogeneity. This aligns with Allen et al. (2012), who demonstrate that account ownership and usage across countries correlate strongly with branch penetration and geographic proximity to financial institutions, with national income accounting for only a modest share of variation in inclusion levels. This spatial dimension is further underscored by OJK's 2024 National Survey on Financial Literacy and Inclusion, which found that the financial inclusion index in urban areas (78.41%) is substantially higher than in rural areas (70.13%), confirming that geographic access gaps remain a defining structural barrier to inclusion in Indonesia (OJK, 2024).

From a strategic business perspective, this finding implies that expansion of the outlet network, particularly into underserved peri-urban and rural areas, represents the highest-leverage intervention for deepening financial inclusion. Unlike intensifying transaction volume among existing customers, network expansion creates new entry points into the formal financial system for previously unbanked populations. This is especially pertinent given that Indonesia's financial inclusion index remained at approximately 75 percent in 2024 (Statista, 2024), still falling short of the government's 90 percent target under the National Strategy for Financial Inclusion/*Strategi Nasional Keuangan Inklusif* (SNKI), a gap that signals the continued urgency of physical network reach as a strategic priority (World Economic Forum, 2026). For institutional players such as Pegadaian, which reported 24.9 million customers as of mid-2024, a 9.14 percent year-on-year increase, and operates within the Ultra Micro Holding ecosystem alongside BRI and PNM, with more than 18,000 combined branches nationwide (World Economic Forum, 2022) The geostrategic deployment of outlets across Indonesia's outer islands and eastern regions constitutes both a social obligation and a long-term market development strategy.

The insignificance of economic growth further reinforces gold pawnbroking's role as a countercyclical, access-based microfinance instrument rather than a sector that moves in lockstep with macroeconomic cycles. This positioning carries important geoeconomic implications in the Indonesian context, where GDP growth tends to be concentrated in Java and select metropolitan corridors. At the same time, large peripheral populations remain structurally disconnected from formal finance. The relative insensitivity of gold pawn demand to aggregate growth conditions suggests that this instrument retains its relevance across the full spectrum of regional economic development levels from high-growth urban centers to stagnant or resource-dependent provincial economies. Morduch (1995, 1999) provides the theoretical foundation for this interpretation, showing that low-income households use microfinance instruments primarily to buffer income shocks and manage short-term liquidity, rather than to participate in national economic growth cycles.

Gold's intrinsic geoeconomic properties reinforce this countercyclical characteristic as a globally recognized store of value. Baur & McDermott (2010) demonstrate that gold serves as a safe-haven asset, maintaining or appreciating during periods of market stress and economic uncertainty. In Indonesia, where gold ownership is deeply embedded in household asset portfolios across ethnic and regional communities, this characteristic translates into a remarkably stable collateral base that remains accessible to households regardless of macroeconomic conditions. The World Gold Council's Indonesia Consumer Insights Report, based on fieldwork conducted in 2024, confirms that gold has long been regarded as a core investment and store-of-value asset in Indonesian households, typically held as heirloom jewelry passed across generations or in the form of gold bars and coins, a pattern that cuts across regional and socioeconomic boundaries (World Gold Council, 2025). Similarly, across ASEAN, over 170 tonnes of gold were consumed in 2023 alone, with gold described as "deeply cultural" across the region, serving simultaneously as a store of value, a medium of intergenerational wealth transfer, and a source of accessible liquidity (World Gold Council, 2024). The cultural embeddedness of gold ownership thus amplifies the strategic value of gold pawn networks as a resilient financial inclusion channel, uniquely suited to Indonesia's socioeconomic and cultural landscape compared to conventional financial products.

The micro-level evidence further substantiates this mechanism. Block (2016) shows that household liquidity shocks significantly drive pawnshop loan uptake, confirming the short-term liquidity buffer function of pawn services. Vargas Hernandez et al. (2025) demonstrate that households prioritize liquidating liquid assets before incurring debt or disposing of long-term holdings. This behavioral pattern positions pawnbroking as a strategically important intermediate liquidity mechanism in household financial portfolios, particularly in economies with limited access to formal credit.

The insignificance of the COVID-19 dummy variable offers a further layer of strategic insight. Despite the pandemic's severe disruption to income and employment, particularly in Indonesia's large informal sector, which, according to BPS data, accounted for approximately 59.17 percent of the total workforce as of February 2024, rising sharply from 57.27 percent before the pandemic in 2019 (BPS, 2024), the number of gold pawn accounts did not undergo a structural change. This persistent informality is geoeconomically significant: with over 72.6 percent of rural workers engaged in informal employment as of 2023 (BPS, 2024), large segments of Indonesia's peripheral population remain outside conventional credit channels and thus constitute a structurally captive demand base for collateral-based microfinance such as gold pawning. Rather than signaling stagnation, this stability reflects the resilience of gold pawn services as a financial coping mechanism: households already within the system intensified their use, while the system's accessibility remained relevant throughout the crisis. This is consistent with Li et al. (2020), who document how COVID-19 severely exacerbated household liquidity constraints, intensifying demand for short-term liquidity instruments. From a strategic standpoint, this crisis-period stability demonstrates that gold pawn networks function as a systemically important microfinance infrastructure, one that retains operational and social relevance precisely during the periods of economic stress when conventional financial channels are most likely to contract or impose tighter credit conditions. The IMF's 2024 Financial Sector Assessment for Indonesia further supports this framing, noting that persistent post-pandemic informality and muted income growth continue to expose large segments of the population to liquidity vulnerabilities that formal banking channels are not yet equipped to address at scale (IMF, 2024).

Taken together, these findings position outlet network geography as the primary strategic lever for deepening financial inclusion through gold pawnbroking in Indonesia. The results underscore that inclusion outcomes are driven by institutional access architecture and the spatial configuration of service delivery rather than by transactional intensity or macroeconomic cycles. This has direct implications for national financial inclusion policy and for the long-term strategic planning of pawnbroking institutions: in Indonesia's geographically fragmented and economically heterogeneous landscape, where to operate is as consequential as how much to transact.

3.2.2 Comparison of financial inclusion mechanisms between conventional and sharia gold pawn

In line with the second objective of this study, this section compares the effectiveness of financial inclusion mechanisms through gold pawnbroking in the conventional and Sharia systems. The results of stacked regression and Wald tests indicate that, although both systems show similar patterns in the influence of turnover, transaction growth, and macroeconomic factors, there are significant structural differences in the role of outlet networks. The Sharia dummy variable coefficient, which distinguishes Sharia gold pawn data from conventional data, shows that the number of gold pawn accounts in the Sharia system is structurally lower than in the conventional system. In other words, under equivalent operational and economic conditions, the Sharia system has a smaller user base. This structural gap is not merely a reflection of commercial performance differentials; it carries important geoeconomic and strategic implications.

The conventional system has reached maturity with a broad, geographically distributed user base built over more than a century of institutional presence since Pegadaian's founding in 1901. In contrast, the Sharia system, formally launched only in 2003 in collaboration with Bank Muamalat Indonesia, remains in an expansion and market-penetration phase, with a fundamentally different geographic footprint (Indupurnahayu et al., 2025). This interpretation is consistent with Wijaya's (2022) findings, which indicate that the development of sharia pawnshops in Indonesia continues to face various structural obstacles, including limited office networks and human resources, and the need to socialize products to the public, so that expansion and the extension of service coverage remain the main agenda for sharia pawnshop development. This gap is further quantified by OJK data, which shows that as of 2023, Sharia financial literacy stood at only 39.11% and Sharia financial inclusion at just 12.88% figures, dramatically lower than the national financial inclusion rate of 75.02% (OJK, 2023).

With respect to physical access, the effect of the outlet ratio on the number of accounts differs significantly between conventional and Islamic systems. In the conventional system, the expansion of the outlet network no longer drives significant growth in the number of accounts, indicating network and market saturation. In the Islamic system, the number of outlets continues to play a strong role in increasing the number of accounts, indicating that limited physical access remains a major obstacle to expanding financial inclusion. This is reflected in the findings of Bahri & Hardiansyah (2022), which show that Islamic pawnshops in Indonesia continue to expand service units across regions as community use of rahn services increases. This divergence in the outlet effect has direct strategic significance: for the conventional system, inclusion growth will need to come from product deepening, customer retention, and digital channel expansion rather than physical footprint, a trajectory consistent with Pegadaian's digital transformation strategy through the Tring super-app platform (Hasinah & Irbayuni, 2026). For the Sharia system, by contrast, physical network expansion into geographically underserved areas, particularly outer islands, rural regions, and the eastern provinces, remains the primary engine of inclusion growth. This finding aligns with comparative evidence from Malaysia, where Razak & Asutay (2022) demonstrate that ar-rahn (Islamic pawnbroking) significantly improves clients' economic well-being, particularly by helping overcome voluntary financial exclusion driven by Sharia-compliance preferences. This mechanism is highly sensitive to physical accessibility in communities where religious identity shapes financial behavior.

The geoeconomic implications of this finding extend to the competitive landscape of Indonesia's Islamic finance ecosystem. A recent systematic literature review by Farah et al. (2025) The impact of Islamic banking across 68 SCOPUS-indexed studies was confirmed: Islamic financial inclusion enables entrepreneurship and local economic activity in marginalized communities, with Islamic pawnbroking specifically highlighted for its role in providing socially responsible credit to women and other excluded groups. For Indonesia, where rural areas in Central and Eastern Indonesia are characterized by simultaneously high informality, strong Muslim identity, and low Sharia financial literacy (OJK, 2023). The Sharia gold pawn system occupies a strategic niche that conventional finance cannot readily occupy: it combines Sharia compliance with collateral-based access, bypassing both the literacy barriers associated with more complex Islamic financial products and the documentation requirements of formal banking. This makes it a structurally irreplaceable instrument in Indonesia's Islamic financial inclusion architecture.

These findings indicate two distinct patterns of financial inclusion in Indonesia's gold pawnbroking sector. The conventional system operates as a mature system, in which the service network primarily serves existing customers. In contrast, the sharia system is still developing and building a user base, making network expansion a key factor in the growth of inclusion. This aligns with Machmud et al. (2024), who emphasize that for sharia pawnshops to function effectively for the Indonesian public, it is necessary to strengthen institutional support, increase public literacy about pawn products, and actively involve various stakeholders in expanding and strengthening sharia pawnshop services. More broadly, a recent empirical study by Masrizal et al. (2025) confirms that Islamic financial literacy directly affects business performance through the mediating role of Islamic financial inclusion in Indonesia, reinforcing the need to address literacy and access simultaneously as mutually reinforcing strategic priorities. This dual imperative, expanding the physical outlet network while investing in Sharia financial education, constitutes the core strategic agenda for closing the conventional-Sharia inclusion gap in Indonesia's gold pawn sector, and should be embedded into the institutional planning frameworks of both Pegadaian's Sharia unit and national Sharia economic governance bodies such as KNEKS (now being transformed into the Islamic Economy Agency/BES) (Rukiah, 2025).

The main findings of this study confirm that service accessibility, as proxied by the ratio of outlets to accounts, is the most important determinant of financial inclusion in gold pawning services. The results of stacked regression estimation and Wald tests indicate a highly significant structural difference between conventional and sharia systems in responding to changes in the outlet ratio. This indicates that service network expansion plays a stronger and distinct role in increasing financial inclusion in the sharia gold pawning system. This structural divergence carries direct strategic significance. In the conventional system, network saturation signals a transition point: future inclusion growth must be pursued through product deepening, customer base diversification, and digital channel expansion. In the Sharia system, by contrast, physical network expansion into geographically underserved areas, particularly outer islands, rural regions, and eastern Indonesia, remains the primary and most potent lever for expanding financial inclusion. The outlet ratio effect thus functions not merely as a business operations metric but as a geoeconomic signal: it maps the frontier of unserved demand, and in the Sharia system, that frontier remains vast. In contrast, turnover and transaction growth variables do not significantly affect the number of accounts and show no differences in mechanisms across systems, indicating that transaction intensity is not a primary factor in expanding the gold pawning service user base. This finding carries an important strategic corollary: institutional growth metrics and financial inclusion metrics are decoupled, and performance evaluation frameworks should therefore incorporate inclusion-specific indicators, particularly the geographic distribution of new accounts and outlet penetration in underserved regions, as metrics distinct from standard revenue or turnover indicators.

The insignificance of the economic growth and COVID-19 dummy variables indicates that gold pawning services exhibit relatively high resilience to macroeconomic fluctuations and short-term shocks. This countercyclical resilience is not incidental; it is structurally rooted in gold's role as a safe-haven asset and in the deep cultural embeddedness of gold ownership across Indonesian households and ethnic communities. Households across the income spectrum, particularly those engaged in the informal sector, maintain gold as a liquidity buffer that remains accessible regardless of the macroeconomic cycle. In this sense, gold pawn services constitute a form of distributed, collateral-based financial resilience infrastructure, anchored in household asset ownership rather than in institutional credit assessment. From a geoeconomic perspective, this resilience quality makes gold pawn networks a uniquely reliable instrument for sustaining financial inclusion in regions that are simultaneously remote, informal-sector-dominated, and prone to income volatility, precisely the populations that conventional banking and digital financial services are least equipped to serve consistently. Thus, gold pawning services serve as a complementary instrument within the national financial system, particularly in a dual financial system that accommodates both conventional and Sharia principles.

4. Conclusions

This study provides empirical evidence on the role of gold pawning services in promoting financial inclusion in Indonesia by comparing conventional and sharia-compliant systems within a single integrated estimation framework. The results indicate that the dynamics of financial inclusion in gold pawning services are determined more by internal structural characteristics than by macroeconomic conditions. Beyond confirming this internal orientation, the findings collectively articulate a broader geoeconomic thesis: in a country as geographically fragmented and institutionally heterogeneous as Indonesia, the spatial architecture of financial service delivery, where outlets are deployed, which populations they reach, and which regulatory framework governs them, is itself a form of strategic economic infrastructure. Although the conventional system has significantly more accounts, the Sharia-compliant system exhibits a different structural configuration, indicating that the differences between the two systems are not merely quantitative but reflect fundamentally different phases of institutional development, geographic penetration, and market maturity, each with distinct strategic trajectories and policy implications for Indonesia's dual financial architecture.

Overall, this study contributes to the financial inclusion literature by introducing accessibility-based inclusion proxies and applying stacked regression to explicitly test structural differences between conventional and sharia-compliant gold pawning systems. The research findings confirm that the success of financial inclusion is determined not only by transaction volume but primarily by the effectiveness of service network design. From a policy perspective, three strategic priorities emerge from this analysis. First, for the Sharia gold pawn system, geographic network expansion into rural, peri-urban, and eastern Indonesian communities must be treated as the primary inclusion intervention, not a by-product of commercial growth. Second, for the conventional system, network saturation signals an inflection point toward hybrid physical digital models that deepen engagement with existing customers while extending reach through agent networks and mobile platforms. Third, at the systemic level, the structural coexistence of a mature conventional system and an expanding Sharia system within a single institutional framework offers a rare strategic asset: the capacity to serve Indonesia's religiously and economically diverse population through a unified yet differentiated service architecture. Optimizing this dual-system complementarity, rather than treating the two systems as competing platforms, should be a central organizing principle of Indonesia's gold pawn policy and of the broader national financial inclusion strategy.

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Data Availability Statement
The data supporting the findings in this study are sourced from publicly available secondary data. Data on gold pawn services were obtained from official reports and publications of PT Pegadaian and the Financial Services Authority (OJK). Macroeconomic data, including economic growth indicators, were obtained from publications of the Central Statistics Agency (BPS). The datasets compiled and processed in this study are available from the corresponding author upon reasonable request.

Conflicts of Interest
The authors declares no conflict of interest in this research.

Declaration of Generative AI Use
During the process of compiling this work, the author used ChatGPT (OpenAI) to assist with language refinement, academic argumentation, and clarity and coherence. After using the tool, the author reviewed and re-edited the entire manuscript as needed.

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