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Understanding Panic Buying During COVID-19: How Fear and Perceived Socioeconomic Consequences Shape Consumer Behavior

Comprender las compras de pánico durante la COVID-19: cómo el miedo y las consecuencias socioeconómicas percibidas moldean el comportamiento del consumidor.

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ABSTRACT

This study examines the psychological and socioeconomic mechanisms underlying panic buying behavior during the COVID-19 pandemic. Data from 300 Istanbul residents were collected through an online survey and analyzed using structural equation modeling (SEM). Results show that fear of COVID-19 significantly increased perceived socioeconomic consequences and panic buying, while socioeconomic consequences emerged as the strongest predictor of panic buying and partially mediated the relationship between fear and this behavior. In contrast, compulsive checking and anti-vaccine attitudes showed no significant effects on panic buying. The model explained 53.9% of the variance in panic buying. The findings suggest that panic buying is not merely an emotional reaction to fear but a cognitively mediated response to anticipated scarcity and economic uncertainty. This perspective extends the understanding of crisis consumer behavior beyond pandemic settings to contexts such as inflation, supply chain disruptions, and other situations involving economic threat and supply uncertainty. The study highlights the importance of transparent supply-chain communication and economic reassurance strategies for governments and retailers during periods of crisis.

Keywords: Panic buying; Consumer behavior; Perceived scarcity; Economic uncertainty; Crisis consumption; SDG.

JEL Code: D12, D91, I12, E21, Z13

RESUMEN

Este estudio examina los mecanismos psicológicos y socioeconómicos subyacentes al comportamiento de compra por pánico durante la pandemia de COVID-19. Se recopilaron datos de 300 residentes de Estambul mediante una encuesta en línea y se analizaron mediante modelos de ecuaciones estructurales (SEM). Los resultados muestran que el miedo a la COVID-19 aumentó significativamente la percepción de consecuencias socioeconómicas y la compra por pánico; asimismo, las consecuencias socioeconómicas surgieron como el predictor más fuerte de la compra por pánico y mediaron parcialmente la relación entre el miedo y dicho comportamiento. Por el contrario, la comprobación compulsiva y las actitudes antivacunas no mostraron efectos significativos en la compra por pánico. El modelo explicó el 53,9 % de la varianza de la compra por pánico. Los hallazgos sugieren que la compra por pánico no es meramente una reacción emocional ante el miedo, sino una respuesta mediada cognitivamente ante la escasez prevista y la incertidumbre económica. Esta perspectiva amplía la comprensión del comportamiento del consumidor en situaciones de crisis, trasciende el ámbito de la pandemia para abarcar contextos como la inflación, las interrupciones en la cadena de suministro y otras que implican amenazas económicas e incertidumbre en el abastecimiento. El estudio subraya la importancia de una comunicación transparente sobre la cadena de suministro y de estrategias para transmitir seguridad económica por parte de los gobiernos y los minoristas durante las crisis.

Palabras clave: Compras de pánico; Comportamiento del consumidor; Escasez percibida; Incertidumbre económica; Consumo en situaciones de crisis; ODS.

Código JEL: D12, D91, I12, E21, Z13

INTRODUCTION

The global COVID-19 pandemic emerged in December 2019 in Wuhan, China, caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), and rapidly escalated into a worldwide health crisis by early 2020 (World Health Organization, 2020a). As fear and uncertainty spread alongside the virus, panic buying emerged as a prominent consumer response — the excessive stockpiling of basic goods that disrupted supply chains and deepened social and economic instability.

Although this study is empirically grounded in the COVID-19 context, the psychological and socioeconomic mechanisms it examines are not unique to pandemics. Comparable patterns of fear-driven stockpiling have been documented across a range of crisis contexts, including natural disasters (Kulemeka, 2010), supply chain disruptions (Sterman & Dogan, 2015), and inflationary episodes (Erdem et al., 2003). The critical activating condition appears to be perceived economic vulnerability and anticipated scarcity — not the specific nature of the crisis itself. Understanding these mechanisms therefore carries implications beyond the pandemic period, including for future public-health emergencies, commodity shocks, and economic crises.

Türkiye recorded its first confirmed COVID-19 case in March 2020, and Istanbul quickly became the country's most affected city. The pandemic unfolded against a backdrop of pre-existing economic vulnerabilities — including persistent inflation exceeding 15% and a sharply depreciating currency — which amplified public concern about resource availability and supply continuity (Pınar, 2022; Voyvoda, 2020).

This economic fragility makes Türkiye a theoretically important context for studying panic buying: when pre-existing financial insecurity is high, even moderate fear activation may be sufficient to trigger acute socioeconomic worry and subsequent stockpiling behavior. Prior studies consistently confirm that fear, anxiety, and perceived scarcity are key drivers of panic buying across various national contexts (Akhrani et al., 2020; Nasiha & Akhrani, 2020; Omar et al., 2021; Taylor, 2021; Schmidt et al., 2021; Seih et al., 2021). However, the specific mechanisms through which fear translates into excessive purchasing behavior remain insufficiently understood, particularly in economically vulnerable settings.

During the pandemic, widespread fear and uncertainty also gave rise to anti-vaccine attitudes, fueled by misinformation, conspiracy theories, and distrust of health authorities (Lazarus et al., 2020; Roozenbeek et al., 2020; Sallam et al., 2021). The present study incorporates anti-vaccine attitudes as a variable to examine whether fear of COVID-19 is associated with vaccine resistance, and whether such attitudes, in turn, relate to panic buying behavior.

Existing research has largely tested the direct relationship between COVID-19 fear and panic buying without adequately examining the underlying psychological and socioeconomic pathways — particularly concerns about inflation, unemployment, and supply disruption that were especially salient in Türkiye. Additionally, compulsive information-seeking behaviors (COVID-19 compulsive checking) and their role in shaping consumer behavior have not been systematically investigated in the Turkish context. This study addresses these gaps by examining fear of COVID-19 and compulsive checking as antecedent factors, and COVID-19 socioeconomic consequences and anti-vaccine attitudes as potential mediators, with panic buying as the outcome variable.

This study makes three specific contributions to the crisis-consumption literature. First, it provides the first SEM-based empirical evidence from Türkiye that COVID-19 socioeconomic consequences partially mediate the fear–panic buying relationship, reframing panic buying as a cognitively mediated, economically driven response rather than a purely impulsive behavior. Second, it empirically distinguishes panic buying from anti-vaccination attitudes as psychologically separate crisis responses, demonstrating that fear of COVID-19 can simultaneously drive stockpiling via socioeconomic worry and vaccine resistance via institutional distrust. Third, by showing that the socioeconomic mediation pathway is amplified under conditions of pre-existing economic vulnerability—as observed in Türkiye in 2021—the study provides boundary-condition evidence suggesting that this mechanism may generalize to other crisis contexts characterized by economic fragility, including inflationary shocks and supply chain disruptions.

The primary objective of this study is to examine the psychological and socioeconomic factors behind panic buying among Turkish consumers during the COVID-19 pandemic. To this end, the study addresses the following research questions.

- Does fear of COVID-19 directly influence panic buying, COVID-19 socioeconomic consequences, and anti-vaccine attitudes?
- Does COVID-19 compulsive checking directly influence panic buying, COVID-19 socioeconomic consequences, and anti-vaccine attitudes?
- Do COVID-19 socioeconomic consequences and anti-vaccine attitudes predict panic buying?
- Do COVID-19 socioeconomic consequences and anti-vaccine attitudes mediate the relationships between fear of COVID-19, compulsive checking, and panic buying?

Through these inquiries, the research seeks to provide empirical evidence from Türkiye to contribute to and extend the existing literature on consumer behavior under crisis conditions. This study focuses on Istanbul — Türkiye's largest and most COVID-affected city — where

the crisis-specific and short-lived nature of panic buying made the pandemic an ideal context for empirical investigation. Data were collected from 300 adult residents via online survey during March–April 2021, which, while sufficient for SEM analysis, limits geographic representativeness and precludes causal inference due to the cross-sectional design. Future studies are encouraged to adopt longitudinal designs and broader, more diverse samples.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Economic Context: COVID-19 and Türkiye

The COVID-19 pandemic generated unprecedented global economic disruption, characterized by supply chain breakdowns, rising unemployment, and inflationary pressures—particularly in the service sector (Baldwin & di Mauro, 2020; Açıkgöz & Günay, 2020). These conditions created fertile ground for panic buying, as consumers facing economic uncertainty sought to secure essential goods before anticipated shortages or price increases materialized.

In Türkiye, these pressures were especially acute. Despite recording a modest 1.8% growth rate in 2020, the country experienced significant inflation, a depreciating lira, and a sharp contraction in consumer confidence (Voyvoda, 2020; Pınar, 2022). The pandemic's arrival in March 2020 triggered immediate behavioral shifts: demand for face masks surged, prices rose tenfold within days, and shelves emptied as panic buying spread rapidly. Government interventions — including ID-based purchasing limits and price ceilings — struggled to contain these pressures (Pınar, 2022).

This economic backdrop is central to understanding why Turkish consumers may have been particularly susceptible to fear-driven stockpiling: pre-existing financial vulnerability lowered the threshold at which COVID-19 fear activated concerns about resource access and supply stability. This combination of elevated fear and pre-existing economic fragility makes Türkiye a theoretically important context for testing the socioeconomic mediation pathway — and for examining whether this mechanism generalizes to non-pandemic crisis contexts characterized by similar conditions.

Panic Buying: Definitions and Explanations

Panic buying refers to the excessive accumulation of storable goods — such as food, cleaning supplies, and medication — during crisis periods, far beyond normal consumption needs (Keane & Neal, 2021). While partly driven by psychological motivations such as the desire to restore a sense of control (Barnes et al., 2020), panic buying also reflects rational economic reasoning: consumers stockpile when they anticipate supply disruptions, rising prices, or restricted store access (Erdem et al., 2003). Hoarding and panic buying are recognized

responses to perceived supply disruptions across various crisis contexts, including natural disasters and pandemics (Kulemeka, 2010; Kawashima et al., 2012; Wang & Hao, 2020). During COVID-19, these behaviors were further intensified by city lockdowns, movement restrictions, and fear of virus transmission, encompassing both rational responses to genuine supply chain risks and irrational reactions driven by anxiety, herd mentality, and loss of perceived control (Sterman & Dogan, 2015; Sim et al., 2020; Yuen et al., 2020; Arafat et al., 2020a, 2020b).

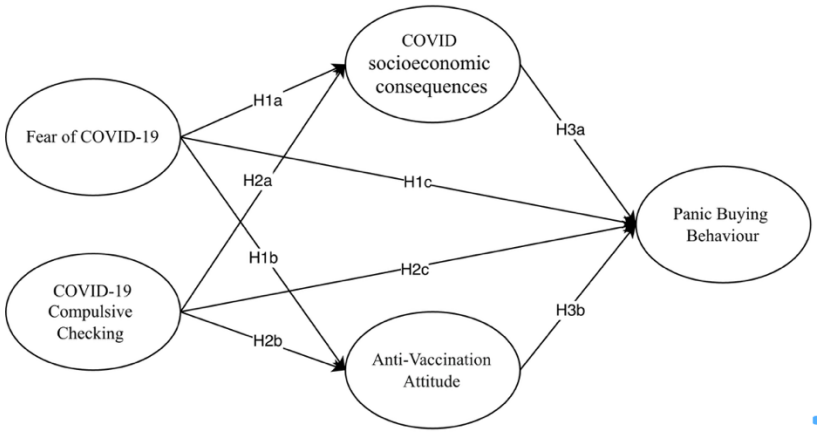
Theoretical Background

A substantial body of theoretical literature has sought to explain panic buying in crisis contexts. Frameworks such as Threat Appraisal Theory and the Health Belief Model position panic buying as a protective response driven by perceived severity and vulnerability (Chua et al., 2021). Compensatory Control Theory suggests that anxiety reduces individuals' sense of control, prompting excessive purchasing as a means of restoring it (Barnes et al., 2020). Social influence perspectives, including Social Learning Theory and crowd psychology, highlight the role of observational cues and media exposure in amplifying stockpiling behavior (Taylor, 2021; Bülbül et al., 2026). Scarcity-based frameworks further emphasize that perceived resource unavailability — whether real or anticipated — serves as a primary behavioral trigger (Omar et al., 2021).

While these theories collectively illuminate the psychological and social underpinnings of panic buying, no single framework fully captures the phenomenon's multidimensional nature, particularly in contexts shaped by acute socioeconomic vulnerability. Rather than anchoring the analysis within one theoretical tradition, the present study draws on this broader theoretical landscape as a conceptual foundation.

The empirical model tested here is inductively grounded in the existing literature and guided by the relationships identified across prior quantitative studies (Figure 1). This approach is consistent with established practice in behavioral consumer research, where theoretically informed but empirically driven models are widely used to examine complex, context-dependent phenomena (Hair et al., 2010; Hayes, 2018). Importantly, while the theoretical frameworks reviewed here were largely developed and tested in pandemic contexts, the underlying mechanisms — threat appraisal, compensatory control, and scarcity perception — are not crisis-specific. The same theoretical logic applies to supply chain disruptions, inflationary episodes, and future public-health emergencies, making this study's empirical findings relevant beyond the COVID-19 context.

Figure 1
The Conceptual Framework of COVID-19 Fear and Panic Buying



Source: Own elaboration.

COVID-19 Fear's Effect on COVID Socioeconomic Consequences

COVID-19 fear has been consistently linked to heightened socioeconomic worry across multiple national contexts. Mertens et al. (2020) identify fear of socioeconomic consequences — including job loss, income reduction, poverty, and economic recession — as a core dimension of COVID-19 fear, alongside fear of infection and product shortages. Economic vulnerability and sudden income losses significantly intensify stress and anxiety during lockdown periods (Sarfraz et al., 2022; Salameh et al., 2020), while perceptions that the economic consequences of pandemic restrictions are being underestimated further amplify public concern (Codagnone et al., 2020; Mishra et al., 2020). In Türkiye, where pre-existing inflation and currency depreciation heightened financial insecurity, COVID-19 fear was particularly likely to activate acute concerns about supply access and economic stability. Building on this evidence, the present study proposes:

H1a: COVID-19 Fear Positively Affects COVID Socioeconomic Consequences.

COVID-19 Fear's Effect on Anti-Vaccination Attitudes

The relationship between COVID-19 fear and vaccination attitudes is complex and context-dependent. While fear of infection generally promotes vaccine acceptance by heightening perceived vulnerability (Bendau et al., 2021; Mertens et al., 2022; Nazlı et al., 2021), this pattern reverses when fear is accompanied by existential anxiety, conspiracy beliefs, or mistrust of health authorities and pharmaceutical companies (Scrima et al., 2021; Adamus et al., 2021).

Under such conditions — particularly when anti-vaccination attitudes are assessed through dimensions of institutional distrust and concerns about commercial profiteering, as in the

VAX scale — heightened COVID-19 fear may paradoxically reinforce vaccine resistance rather than acceptance (Choi et al., 2022; Scrima et al., 2021). Given the high levels of misinformation and institutional skepticism observed during the pandemic, the present study proposes:

H1b: COVID-19 Fear Positively Affects Anti-Vaccination Attitudes.

COVID-19 Fear's Effect on Panic Buying

The COVID-19 pandemic generated widespread fear, anxiety, and stigma across populations, driven by the virus's high contagiousness and mortality (Ahorsu et al., 2022; Guan et al., 2020). Fear in the context of infectious disease is closely tied to perceived transmission risk, morbidity, and mortality, and tends to amplify psychosocial distress (Pappas et al., 2009). This heightened fear environment directly shaped consumer behavior, most notably by triggering panic buying as a protective response to perceived threat and anticipated scarcity.

Empirical evidence consistently identifies COVID-19 fear as a primary driver of panic buying. Fear was found to be the dominant predictor of panic buying, outweighing institutional trust (Akhrani et al., 2020; Nasiha & Akhrani, 2020). Anxiety fully mediated the relationship between uncertainty, perceived scarcity, and panic buying (Omar et al., 2021), while media exposure and intolerance of uncertainty amplified fear-driven purchasing (Schmidt et al., 2021).

Notably, COVID-19 fear triggered panic buying particularly through economic concerns (Seih et al., 2021), and extended lockdowns transformed stockpiling from a functional response into a psychological coping mechanism (Badgaiyan & Verma, 2015; Wu et al., 2021). Building on this evidence, the present study proposes:

H1c: COVID-19 Fear Positively Affects Panic Buying Behavior.

Compulsive Checking's Effect on Panic Buying

During the COVID-19 pandemic, many individuals engaged in repetitive information-seeking behaviors — such as constantly monitoring news updates, checking case numbers, and following pandemic-related social media content. Collectively referred to as compulsive checking, these behaviors represent a maladaptive response to uncertainty rooted in intolerance of ambiguity: individuals repeatedly seek information to reduce uncertainty, yet this paradoxically amplifies anxiety and perceived threat rather than alleviating it (Carleton, 2016; Taylor et al., 2020a).

Excessive media consumption during the pandemic was associated with heightened anxiety, increased threat perception, and greater psychological distress (Garfin et al., 2020). In the

context of panic buying, individuals who frequently monitor pandemic-related news are more likely to perceive scarcity and supply disruption, which may trigger excessive purchasing behavior (Naeem, 2021). Although qualitative and logical reasoning support this relationship, it has not yet been tested with quantitative empirical data in the Turkish context. The present study therefore proposes:

H2c: COVID-19 Compulsive Checking Positively Affects Panic Buying.

COVID-19 Compulsive Checking's Effect on Anti-Vaccination Attitudes

COVID-19 compulsive checking significantly influences anti-vaccination attitudes through information overload and misinformation exposure. Although moderate information seeking can heighten risk perception and encourage protective behaviors, compulsive checking frequently results in heightened anxiety and exposure to misinformation, all of which contribute to stronger anti-vaccination attitudes (Taylor et al., 2020b).

Excessive digital media search for COVID-19 information amplifies conspiracy beliefs and reduces vaccination intention through increased risk misperception (Gao et al., 2023). Furthermore, COVID-19 stress factors, including compulsive checking, have been linked to greater vaccine hesitancy via structural pathways (Batley et al., 2024). Based on this reasoning, the following hypothesis is proposed:

H2b: COVID-19 Compulsive Checking Positively Affects Anti-Vaccination Attitudes.

Compulsive Checking's Effect on COVID Socioeconomic Consequences

Compulsive checking, as a sub-dimension of COVID-19 Stress Syndrome, is theoretically linked to heightened socioeconomic worry (Taylor et al., 2020b). Concerns about financial strain and job loss represent a distinct yet interconnected facet of pandemic-related distress and substantially contribute to overall COVID-19 stress levels (Codagnone et al., 2020).

Although compulsive checking and socioeconomic worry are correlated within the syndrome ($r = .49–.53$; Taylor et al., 2020a), empirical research directly examining the directional relationship between these constructs remains limited. Theoretically, excessive information monitoring can exacerbate cognitive biases and information overload, thereby heightening threat perception regarding financial stability and supply availability. Based on this reasoning, the present study proposes:

H2a: COVID-19 Compulsive Checking Positively Affects COVID Socioeconomic Consequences.

COVID Socioeconomic Consequences' Effect on Panic Buying

Socioeconomic worry has been consistently identified as a significant driver of panic buying during the COVID-19 pandemic. Individuals who perceived economic consequences—including supply shortages, rising unemployment, and financial collapse—as underestimated reported substantially higher stockpiling tendencies (Codagnone et al., 2020; Mishra et al., 2020). Financial vulnerability further amplified this effect: job insecurity and fear of impoverishment intensified stress responses that translated directly into compensatory panic buying (Sarfraz et al., 2022; Salameh et al., 2020). More directly, COVID-19 fear was found to trigger panic buying primarily through economic concerns, with socioeconomic worry functioning as the key mediating pathway between pandemic fear and excessive purchasing (Seih et al., 2021; Omar et al., 2021; Baldwin & di Mauro, 2020). Based on this evidence, the present study proposes:

H3a: COVID Socioeconomic Consequences Positively Affect Panic Buying Behavior.

Anti-Vaccination Attitudes' Effect on Panic Buying

Anti-vaccination attitudes and panic buying share overlapping psychological roots, including heightened risk perception, institutional distrust, susceptibility to misinformation, and fear-driven reactance (Hornsey et al., 2018; Fasce et al., 2023; Ann & Baumann, 2023). Individuals with anti-vaccination attitudes frequently exhibit conspiratorial thinking and resistance to official guidance — psychological profiles similarly associated with panic buying driven by loss of control and distrust (Pertwee et al., 2022).

Misinformation exposure serves as a key shared driver, with social media-induced fear simultaneously exacerbating both stockpiling and vaccine refusal (Ruggeri et al., 2024; Hita et al., 2022). Although direct empirical links between these constructs remain scarce, the convergence of shared psychological mechanisms suggests a positive predictive relationship. Based on this reasoning, the present study proposes:

H3b: Anti-Vaccination Attitudes Positively Affect Panic Buying Behavior.

Mediating Effects of COVID Socioeconomic Consequences and Vaccination Attitudes

Building on the direct relationships established above, this study further examines whether COVID Socioeconomic Consequences and anti-vaccination attitudes function as mediating mechanisms linking COVID-19 fear and compulsive checking to panic buying. Mediation analysis enables the identification of indirect pathways through which antecedent variables influence outcomes (Hayes, 2018; Preacher & Hayes, 2008). The following hypotheses are derived from the combinations of direct relationships proposed in the preceding sections:

H4a: COVID Socioeconomic Consequences mediates the relationship between COVID-19 fear and panic buying.

H4b: Anti-vaccination attitudes mediate the relationship between COVID-19 fear and panic buying.

H4c: COVID-19 socioeconomic consequences mediate the relationship between compulsive checking and panic buying.

H4d: Anti-vaccination attitudes mediate the relationship between compulsive checking and panic buying.

The VAX Scale's second-order factor structure adds complexity to the mediation pathways involving anti-vaccination attitudes (H4b and H4d). As vaccination attitudes are operationalized as a higher-order latent construct comprising four subscales, the mediation effects in these pathways should be interpreted with this structural complexity in mind. Testing these mediation pathways provides the first SEM-based empirical evidence in the Turkish context of the mechanisms linking crisis-induced fear to panic buying — evidence with theoretical implications extending to other economically vulnerable crisis settings.

METHODOLOGY

Research Design

This study employs a quantitative, cross-sectional survey design. Data were collected during the peak period of the COVID-19 pandemic in Türkiye (March–April 2021), as evidenced by the highest recorded daily case numbers during this period (Turkish Ministry of Health, 2021). Structural equation modeling (SEM) was used to test the proposed conceptual model because it allows simultaneous estimation of multiple relationships among latent constructs while accounting for measurement error (Hair et al., 2010). Measurement model validity, including convergent and discriminant validity, is reported to assess common method bias. Cross-sectional designs are widely used and accepted for theory-testing purposes in behavioral consumer research, enabling efficient data collection and simultaneous examination of multiple variables (Creswell & Creswell, 2018; Podsakoff et al., 2003).

Sampling Method

A convenience sampling method was employed due to the practical constraints of data collection during an active pandemic period, when access to the general population was significantly limited. Convenience sampling is appropriate when probability sampling is not

feasible and when the target population shares a common experience relevant to the research question (Etikan et al., 2016).

While this approach limits external generalizability, the sample's shared pandemic experience ensures construct relevance and internal validity. Participants were adults aged 18 and over residing in Istanbul — Türkiye's most COVID-affected city — during March–April 2021. Istanbul was selected as the research setting because it is Türkiye's most COVID-affected and economically exposed city, where pre-existing financial vulnerabilities—including inflation and currency depreciation—made consumers particularly susceptible to fear-driven stockpiling. The target sample size of 300 was determined based on SEM requirements, as a minimum of 200 observations is recommended for stable parameter estimates in models with multiple latent constructs (Hair et al., 2010; Anderson & Gerbing, 1988; Boomsma & Hoogland, 2001). Participants who had not resided in Istanbul during the relevant period, lacked direct pandemic experience, or failed to complete the survey in full were excluded from the final analysis. (Table 1)

Table 1
Demographic Characteristics of the Sample (N = 300)

Variable	Category	n	% of Total	Cumulative %
Gender	Woman	162	54.0%	54.0%
	Man	138	46.0%	100.0%
Marital Status	Married	158	52.7%	52.7%
	Single	142	47.3%	100.0%
Age	20 and below	27	9.0%	9.0%
	Between 21 – 30	88	29.3%	38.3%
	Between 31 – 40	107	35.7%	74.0%
	Between 41 – 50	53	17.7%	91.7%
	Between 51 – 60	23	7.7%	99.4%
	61 and above	2	0.7%	100.0%
Education Level	Primary, middle school	7	2.3%	2.3%
	High school	53	17.7%	20.0%
	Associate Degree	23	7.7%	27.7%
	Bachelor's	120	40.0%	67.7%
	Master's	82	27.3%	95.0%
	PhD	15	5.0%	100.0%
Monthly Income	2000 TL and below	54	18.0%	18.0%
	Between 2001 – 4000 TL	53	17.7%	35.7%
	Between 4001 – 6000 TL	75	25.0%	60.7%
	Between 6001 – 8000 TL	61	20.3%	81.0%
	8001 TL and above	57	19.0%	100.0%

Note. n = frequency count; % of Total = percentage of total sample
Source: Own elaboration.

Data Collection

The survey was developed and administered through the SurveyMonkey platform, enabling rapid data collection and access to a geographically diverse urban sample (Lefever et al., 2007). A pilot study was conducted with 45 participants prior to main data collection to assess scale reliability and improve questionnaire quality; Cronbach's alpha coefficients for all scales exceeded the .70 threshold recommended by Field (2018).

To minimize response bias, trap questions and reverse-scored items were embedded to verify respondent attention. Responses that did not meet the minimum completion time criterion or displayed uniform scores across all items were excluded. Of the 320 responses received, 20 failed validity criteria and were removed, yielding a final sample of 300 (Hair et al., 2010). The study was conducted in accordance with the Declaration of Helsinki. Participation was voluntary, informed consent was obtained before data collection, and all data were analyzed anonymously.

Measures

All independent, mediating, and dependent variables were measured using validated instruments. Fear of COVID-19 was assessed with the 7-item Fear of COVID-19 Scale (FCV-19S; Ahorsu et al., 2022), which captures emotional, physiological, and cognitive fear responses to the pandemic (α = .864); the Turkish adaptation was developed by Satici et al. (2020) and Haktanir et al. (2022).

COVID-19 Compulsive Checking was operationalized using the 6-item compulsive checking and reassurance-seeking subscale of the COVID Stress Scales (CSS; Taylor et al., 2020a), measuring repetitive information-seeking behaviors such as monitoring news and social media (α = .829); Demirgöz Bal et al. (2021) validated the Turkish version. COVID Socioeconomic Consequences were measured with the corresponding 6-item CSS subscale (Taylor et al., 2020a), assessing concerns about pandemic-related shortages of food, supplies, and medication (α = .945). Both CSS subscales were used independently, consistent with their established psychometric properties (Taylor et al., 2020a).

Vaccination Attitudes were measured using the 12-item Vaccination Attitudes Examination (VAX) Scale (Martin & Petrie, 2017). The VAX Scale comprises four first-order dimensions — mistrust of vaccine benefit, worries about unforeseen effects, concerns about commercial profiteering, and preference for natural immunity — each measured by three items, which together load onto a single second-order latent construct representing overall vaccination attitudes (α = .879; subscale α range: .726–.931).

This second-order factor structure is consistent with the original scale development and validation (Martin & Petrie, 2017); Yildiz et al. (2021) conducted the Turkish adaptation. The dependent variable, Panic Buying, was assessed with the 7-item Panic Buying Scale (PBS; Lins & Aquino, 2020), designed to capture fear- and uncertainty-driven bulk purchasing behavior (α = .959). Because no validated Turkish version was available at the time of data collection, the PBS was translated into Turkish using a standard forward-back translation procedure. The translated scale demonstrated excellent internal reliability in the present study (α = .959), providing initial evidence of its psychometric suitability for Turkish samples. All Cronbach's alpha coefficients exceeded the .70 threshold recommended by Field (2018). The scales and their items are provided in the Appendix.

Structural Equation Modeling (SEM)

Relationships among COVID-19 Fear, Compulsive Checking, COVID Socioeconomic Consequences, Vaccination Attitudes, and Panic Buying were examined through mediation analysis using structural equation modeling (SEM) in IBM SPSS AMOS 24.0. Mediation effects were assessed using 2,000 bootstrapped samples with bias-corrected 95% confidence intervals. Maximum Likelihood estimation was applied, as the normality assumption was satisfied (Collier, 2020).

The measurement model was tested prior to structural analysis. The VAX Scale was specified as a second-order factor structure, with four first-order subscales serving as indicators of the higher-order latent construct. Covariance was specified between four item-error pairs (F1–F2, F9–F10, SE4–SE6, P1–P2) based on modification indices and theoretical justification reflecting shared content overlap (Byrne, 2010; Hair et al., 2010). The measurement model demonstrated acceptable fit: $\chi^2/df = 2.055$; CFI = .919; SRMR = .072; RMSEA = .059 (Hu & Bentler, 1999). The structural model similarly yielded adequate fit: $\chi^2/df = 2.068$; CFI = .918; SRMR = .076; RMSEA = .060 (Hu & Bentler, 1999). Full results are presented in Table 4.

Measurement Model Validity

We assessed convergent and discriminant validity of the measurement model before structural analysis. Composite reliability (CR) values ranged from .826 to .959, all exceeding the recommended .70 threshold (Hair et al., 2010). Average variance extracted (AVE) values were .747 for COVID Socioeconomic Consequences and .770 for Panic Buying, both exceeding the .50 benchmark. AVE values for COVID-19 Fear (.479) and Compulsive Checking (.455) fell marginally below .50; however, given that CR values for these constructs substantially exceeded .70, construct reliability is considered acceptable (Hair et al., 2010). For the VAX Scale, given its validated second-order factor structure (Martin & Petrie, 2017), reliability was assessed at the subscale level; all four subscales demonstrated

acceptable CR values (range: .726–.931). Full reliability and validity indices are presented in Table 2.

Table 2
Cronbach's Alpha Coefficients of Scales and Subscales Used in the Study

Scale	Items	α	CR	AVE
COVID-19 Fear Scale	**7**	.864	.860	.479
COVID-19 Compulsive Checking Scale	**6**	.829	.826	.455
COVID Socioeconomic Consequences	**6**	.945	.947	.747
Vaccination Attitudes Examination (Vax) Scale	**12**	.879	.726–.931†	—
Mistrust of Vaccine Benefit	3	.931	-	-
Worries About Unforeseen Future Effects	3	.848	-	-
Concerns About Commercial Profiteering	3	.726	-	-
Preference For Natural Immunity	3	.735	-	-
Panic Buying Scale	**7**	.959	.959	.770

Source: Own elaboration. †CR reported at subscale level due to second-order factor structure.

Discriminant validity was assessed using the Heterotrait-Monotrait (HTMT) ratio of correlations. All HTMT values fell below the conservative .85 threshold (Henseler et al., 2014), confirming that the constructs are empirically distinct (Table 3).

Table 3
Heterotrait-Monotrait (HTMT) Ratio of Correlations

	COVID Fear	Comp. Checking	COVID SE	Panic Buying
COVID-19 Fear	-			
COVID-19 Compulsive Checking	.715	-		
COVID Socioeconomic Consequences	.574	.463	-	
Panic Buying	.557	.406	.688	-

Source: Own elaboration. Note. All HTMT values below the .85 threshold indicate acceptable discriminant validity (Henseler et al., 2014)

Common Method Bias Assessment

Given the cross-sectional, self-report nature of this study, we systematically evaluated the potential for common method bias (CMB) using both procedural and statistical remedies, following the recommendations of Podsakoff et al. (2003). At the procedural level, we implemented several design-based measures prior to data collection to reduce CMB risk. Reverse-scored items were embedded throughout the questionnaire to disrupt response set tendencies. We included attention-check (trap) questions to identify and exclude inattentive respondents.

Full anonymity was guaranteed to all participants to minimize social desirability bias. Additionally, the independent, mediating, and dependent variables were presented in clearly separated sections of the survey instrument to reduce the likelihood that respondents would infer and artificially inflate associations between constructs.

At the statistical level, Harman's single-factor test was conducted by entering all scale items (N = 38) into a principal component analysis with no rotation, forcing extraction of a single component (Podsakoff et al., 2003). The single extracted factor accounted for 30.8% of the total variance — substantially below the 50% threshold commonly used as an indicator of serious common method bias. This result suggests that common method variance is unlikely to represent a significant confound in the present dataset.

Taken together, the procedural safeguards implemented at the design stage and the statistical evidence from Harman's test collectively indicate that common method bias does not pose a substantial threat to the validity of the findings reported in this study. Nevertheless, consistent with standard practice in cross-sectional behavioral research, the possibility of residual common method variance cannot be entirely eliminated.

FINDINGS

This study employed structural equation modeling (SEM) to test a conceptual model examining the psychological and socioeconomic drivers of panic buying among Turkish consumers during the COVID-19 pandemic (Table 4, Figure 2). The measurement model demonstrated acceptable fit ($\chi^2/df = 2.055$; CFI = .919; SRMR = .072; RMSEA = .059), and the structural model similarly confirmed adequate fit ($\chi^2/df = 2.068$; CFI = .918; SRMR = .076; RMSEA = .060), validating the suitability of the model for interpretation (Hair et al., 2010). Given the cross-sectional and self-report nature of this study, the findings should be interpreted as associations consistent with the proposed theoretical model rather than definitive causal relationships. Of the twelve hypotheses tested, five were supported and seven were rejected (Table 5). The model explained 53.9% of the variance in panic buying, representing strong explanatory power in behavioral research.

Table 4
Structural Equation Model Mediation Analysis Results

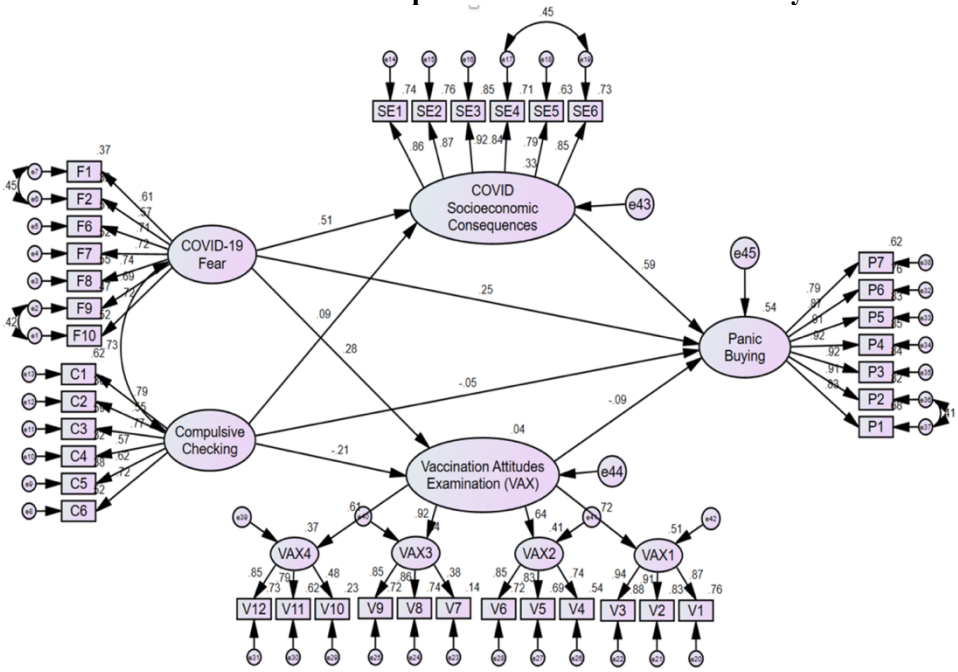
Predictor Variable		Outcome Variable	β	B	SE	t	p
COVID Fear	→	COVID SE	.508	0.600	0.118	5.101	< .001***
COVID Fear	→	Vax Attitude	.279	0.113	0.050	2.233	.026*
COVID Fear	→	Panic Buying	.250	0.309	0.111	2.795	.005**
Comp. Checking	→	COVID SE	.088	0.097	0.104	0.938	.348
Comp. Checking	→	Vax Attitude	-.205	-0.078	0.046	-1.695	.090
Comp. Checking	→	Panic Buying	-.046	-0.054	0.092	-0.589	.556
COVID SE	→	Panic Buying	.593	0.621	0.065	9.600	< .001***
Vax Attitude	→	Panic Buying	-.091	-0.280	0.154	-1.817	.069

Indirect Effects (Mediation Effects)	Total Effect	Bootstrap Confidence Interval (Lower / Upper)	p	Mediation Effect Type
Fear → COVID SE → Panic	0.373	0.166 / 0.603	.001***	Partial
Fear → Vax Attitude → Panic	-0.032	-0.119 / 0.003	.077	-
Comp. Check → COVID SE → Panic	0.060	-0.104 / 0.265	.468	-
Comp. Check → VAX → Panic	0.022	-0.006 / 0.092	.122	-

CMIN [648, N = 300] = 1340.272; p < .001; χ^2/df = 2.068;
CFI = .918; SRMR = .076; RMSEA = .060
***p < .001, **p < .01, *p < .05**

CMIN [648, N = 300] = 1340.272; p < .001; χ2/df = 2.068;
CFI = .918; SRMR = .076; RMSEA = .060
*** p < .001, ** p < .01, * p < .0
Source: Own elaboration.

Figure 2
Structural Equation Model Mediation Analysis Results



Source: Own elaboration.

Table 5
Confirmation Status of the Hypotheses

Hypotheses	Confirmed
H1a: COVID-19 fear affects COVID Socioeconomic Consequences.	Yes
H1b: COVID-19 fear affects Vaccination Attitudes.	Yes
H1c: COVID-19 fear affects Panic Buying.	Yes
H2a: COVID-19 Compulsive Checking affects COVID Socioeconomic Consequences.	No
H2b: COVID-19 Compulsive Checking affects Vaccination Attitudes.	No
H2c: COVID-19 Compulsive Checking affects Panic Buying.	No
H3a: COVID Socioeconomic Consequences affects Panic Buying.	Yes
H3b: Vaccination Attitudes affects Panic Buying.	No
H4a: COVID Socioeconomic Consequences mediates the relationship between COVID-19 fear and Panic Buying.	Yes
H4b: Vaccination Attitudes mediates the relationship between COVID-19 fear and Panic Buying.	No
H4c: COVID Socioeconomic Consequences mediates the relationship between COVID-19 Compulsive Checking and Panic Buying.	No
H4d: Vaccination Attitudes mediates the relationship between COVID-19 Compulsive Checking and Panic Buying.	No

Source: Own elaboration.

The Direct Effects of COVID-19 Fear

COVID-19 fear emerged as the central and most consistent driver across the model. It significantly and positively predicted COVID Socioeconomic Consequences ($\beta = .508$, $p < .001$), Anti-Vaccination Attitudes ($\beta = .279$, $p = .026$), and Panic Buying ($\beta = .250$, $p = .005$), supporting H1a, H1b, and H1c respectively. Together, COVID-19 fear and Compulsive Checking accounted for 33.1% of the variance in Socioeconomic Consequences, with fear being the dominant predictor. These findings suggest that COVID-19 fear extends well beyond health concerns and is associated with both economic anxieties and purchasing behavior simultaneously, consistent with Akhrani et al. (2020), Nasiha and Akhrani (2020), and Schmidt et al. (2021).

The positive relationship between COVID-19 fear and Anti-Vaccination Attitudes ($\beta = .279$) requires careful interpretation. Given that the VAX scale measures anti-vaccination attitudes (Martin & Petrie, 2017), this positive coefficient indicates that higher fear is associated with stronger anti-vaccination sentiments —a pattern that partially contradicts the broader literature, which typically associates COVID-19 fear with greater vaccine acceptance (Mertens et al., 2021; Bendau et al., 2021; Nazlı et al., 2021).

A plausible explanation is that highly fearful individuals may simultaneously distrust institutional responses, including vaccination programs, particularly in sociocultural contexts characterized by skepticism toward government health authorities (Sobierajski et al., 2023; McRee et al., 2022). However, the extremely low variance explained in Anti-Vaccination Attitudes (3.7%) indicates that COVID-19 fear and Compulsive Checking are poor predictors of anti-vaccination attitudes overall, suggesting that stable dispositional factors — such as

institutional trust, political ideology, and prior vaccination history — are the primary determinants of anti-vaccination attitudes.

The Null Effects of COVID-19 Compulsive Checking

Contrary to theoretical expectations, COVID-19 Compulsive Checking showed no significant association with any outcome variable. It failed to predict Socioeconomic Consequences ($\beta = .088$, $p = .348$), Anti-Vaccination Attitudes ($\beta = -.205$, $p = .090$), or Panic Buying ($\beta = -.046$, $p = .556$), leading to the rejection of H2a, H2b, and H2c. These null findings are noteworthy given that prior conceptual work has suggested that excessive information monitoring should amplify anxiety and panic buying behavior (Naeem, 2021; Garfin et al., 2020). Once COVID-19 fear was controlled for in the structural model, compulsive checking contributed no unique explanatory variance to any downstream outcome —a pattern consistent with structural suppression given the high intercorrelation between these two constructs within the COVID Stress Scales ($r = .53–.54$; Taylor et al., 2020a).

COVID Socioeconomic Consequences as the Strongest Predictor

COVID Socioeconomic Consequences was the single strongest direct predictor of panic buying ($\beta = .593$, $p < .001$), fully supporting H3a. The magnitude of this effect substantially exceeded the direct fear effect ($\beta = .250$), suggesting that concerns about supply chain disruptions —including grocery store closures, food shortages, and medication unavailability—show a stronger association with stockpiling behavior than the direct fear effect of the virus itself.

This finding aligns with Seih et al. (2021), who found that the economic dimension of COVID-19-related fear strongly predicted panic buying behavior. It is also consistent with the broader pattern documented by Codagnone et al. (2020), who showed that concern over the economic consequences of pandemic policy —independent of health-related fear— was a robust predictor of psychological distress, underscoring that economic threat, rather than health threat alone, operates as a distinct and consequential driver of crisis-related responses. Following Cohen's (1988) conventions for standardized effect sizes (small ≈ .10, medium ≈ .30, large ≥ .50), the .593 path coefficient observed here qualifies as a large effect.

This magnitude is broadly consistent with the strength of the economic-concern–panic-buying association reported elsewhere in the literature —for instance, Seih et al. (2021) similarly found a large bivariate correlation between the economic dimension of COVID-19-related fear and panic buying behavior ($r = .51$) in a multi-country sample. This comparatively strong association is consistent with the structural economic vulnerability of the Turkish context at the time of data collection —persistent double-digit inflation and

currency depreciation — which may have amplified the salience of economic threat relative to settings with greater macroeconomic stability.

Anti-Vaccination Attitudes did not significantly predict panic buying (β = -.091, p = .069), rejecting H3b. Although a marginal negative trend was observed, it did not reach statistical significance, indicating that anti-vaccination attitudes and panic buying are driven by psychologically distinct mechanisms —one dispositional and stable, the other situationally reactive.

The Mediating Role of COVID Socioeconomic Consequences

Bootstrap mediation analysis revealed one significant indirect effect: COVID-19 fear on panic buying via COVID Socioeconomic Consequences (B = 0.373, 95% CI [0.166, 0.603], p = .001), supporting H4a as partial mediation. Since the direct effect of COVID-19 fear on panic buying remained significant when the mediator was included (β = .250, p = .005), COVID Socioeconomic Consequences is consistent with the role of a partial mediator. The indirect effect (B = 0.373) exceeded the direct effect in magnitude, suggesting that most of the association between fear and panic buying is explained through economic threat appraisal rather than direct emotional reactivity—a pattern consistent with panic buying as a cognitively mediated, economically informed response to anticipated scarcity.

The remaining three mediation hypotheses were all rejected. The indirect effect of COVID-19 fear through Anti-Vaccination Attitudes was non-significant (B = -0.032, 95% CI [-0.119, 0.003], p = .077), rejecting H4b. The indirect effects of Compulsive Checking through Socioeconomic Consequences (B = 0.060, 95% CI [-0.104, 0.265], p = .468) and through Anti-Vaccination Attitudes (B = 0.022, 95% CI [-0.006, 0.092], p = .122) were similarly non-significant, rejecting H4c and H4d respectively. Full results are presented in Table 5.

DISCUSSION

COVID-19 Fear as the Central Driver of Crisis Consumer Behavior

The findings reinforce the central role of COVID-19 fear in shaping crisis consumer behavior. Fear was the only antecedent to show significant associations across all outcome pathways, and was positively linked to socioeconomic worry, vaccination attitudes, and panic buying— consistent with threat appraisal frameworks and prior empirical literature (Chua et al., 2021; Omar et al., 2021; Akhrani et al., 2020; Taylor, 2021).

Crucially, the present findings suggest that fear does not primarily operate through direct emotional reactivity. The larger magnitude of the indirect pathway (B = 0.373) compared to the direct effect (β = .250) is consistent with a cognitive appraisal process linking fear to

concerns about economic disruption, resource scarcity, and supply chain instability, which are in turn associated with excessive purchasing. This pattern — Fear → Economic Threat Appraisal → Behavioral Response — is consistent with panic buying as a cognitively mediated, economically informed response to anticipated scarcity rather than a purely impulsive behavior (Keane & Neal, 2021; Erdem et al., 2003).

Socioeconomic Worry as the Critical Mediating Mechanism

The partial mediation finding (H4a) is the most substantively important result of this study, identifying COVID Socioeconomic Consequences as the key explanatory variable linking pandemic fear and panic buying in this sample. This is particularly interpretable in the Turkish context: in March–April 2021, Istanbul consumers were navigating persistent inflation exceeding 15% and a depreciating lira, meaning that even moderate COVID-19 fear was associated with acute concerns about supply access and price stability (Pınar, 2022; Voyvoda, 2020). These structural economic vulnerabilities likely amplified the socioeconomic mediation pathway beyond what would be observed in more economically stable contexts, and the present study provides the first SEM-based empirical evidence of this mechanism in Türkiye.

Although this study is empirically grounded in the COVID-19 pandemic, the Fear → Socioeconomic Threat Appraisal → Panic Buying pathway is not theoretically limited to health crises. The critical activating condition is perceived economic vulnerability and anticipated scarcity — not the specific nature of the crisis. Comparable mechanisms have been documented in non-pandemic contexts: Sterman and Dogan (2015) found that phantom ordering and hoarding are associated with supply chain disruptions consistent with fear-of-shortage logic; Erdem et al. (2003) found that anticipated price increases were associated with rational stockpiling during inflationary episodes; and Kulemeka (2010) observed panic buying patterns following natural disasters, consistent with resource-scarcity appraisals. These parallels suggest that the socioeconomic mediation pathway identified in this study is likely to generalize to other crisis contexts characterized by supply uncertainty and economic threat — including commodity shocks, currency crises, and future public-health emergencies.

The boundary condition that appears to moderate the strength of this pathway is country-level economic fragility: in contexts where pre-existing inflation, income inequality, or supply chain instability are elevated, even moderate levels of fear may be associated with acute stockpiling via socioeconomic worry. Cross-national replication studies that systematically vary country-level economic indicators are therefore warranted to establish the scope conditions of this model.

The Null Effects of Compulsive Checking: Suppression and Temporal Attenuation

The complete failure of COVID-19 Compulsive Checking to predict any outcome variable is explained by two complementary mechanisms. First, structural suppression: compulsive checking and fear are highly intercorrelated within the COVID Stress Scales (r = .53–.54; Taylor et al., 2020a), and in a simultaneous SEM, shared variance is attributed to fear, leaving compulsive checking with no unique explanatory variance. Second, a temporal effect: data were collected in March–April 2021, approximately thirteen months after the pandemic's onset, by which point repetitive news-monitoring had likely become habitual and emotionally neutral — and may no longer be associated with anxiety amplification at this stage of the crisis (Carleton, 2016). Future research should examine whether compulsive checking exerts stronger effects during the acute early stages of a crisis, when information is novel, and uncertainty is at its peak.

Notably, although non-significant (p = .090), the path from Compulsive Checking to Anti-Vaccination Attitudes was unexpectedly negative (β = -.205), suggesting that intensive information-seeking may be associated with more favorable rather than more resistant anti-vaccination attitudes. This contrasts with research linking compulsive checking to misinformation exposure and vaccine hesitancy (Taylor et al., 2020b; Gao et al., 2023), and may reflect either prolonged exposure to dominant pro-vaccine media messaging during the chronic pandemic phase, or suppression by the concurrently modeled fear variable. Given its borderline significance and unexpected direction, this path warrants replication in future studies during the acute phase of a health crisis (Carleton, 2016; Batley et al., 2024).

Anti-Vaccination Attitudes as a Dispositionally Distinct Construct

It is important to distinguish between two conceptually separate findings involving vaccination attitudes. Fear of COVID-19 significantly predicted anti-vaccination attitudes (β = .279, p = .026), supporting H1b and confirming that heightened pandemic fear is associated with greater vaccine resistance — a pattern consistent with research showing that existential anxiety and institutional mistrust can paradoxically amplify vaccine hesitancy rather than reduce it (Scrima et al., 2021; Adamus et al., 2021). This finding is theoretically meaningful: it suggests that COVID-19 fear does not uniformly correspond to health-protective behavior, but is associated with both socioeconomic-driven stockpiling and distrust- and anxiety-driven resistance to vaccination.

However, anti-vaccination attitudes themselves did not significantly predict panic buying (β = -.091, p = .069), rejecting H3b and H4b. This null finding should not be interpreted as evidence that vaccination attitudes are irrelevant to crisis behavior in general — rather, it reflects a fundamental psychological distinction between the two constructs. The VAX Scale (Martin & Petrie, 2017) measures stable, trait-like dispositional attitudes toward vaccination

formed through years of socialization, whereas panic buying is an acutely state-dependent response to situationally perceived scarcity (Taylor, 2021; Omar et al., 2021).

These constructs operate at fundamentally different psychological layers —one dispositional, one situational— and the absence of a significant path from vaccination attitudes to panic buying is therefore theoretically coherent rather than anomalous. Interventions targeting panic buying, such as supply chain transparency and economic reassurance messaging, are unlikely to predictably affect vaccination attitudes, and vice versa; these phenomena require separate policy frameworks and communication strategies—a distinction that remains equally relevant in future crises, whether pandemic-related, economic, or supply-chain-driven.

International and Cross-Context Relevance

Although this study is empirically grounded in a single national context, the theoretical mechanism it identifies is not bound to Türkiye or to the COVID-19 pandemic specifically. The critical activating condition underlying the fear–panic buying relationship is perceived economic vulnerability and anticipated scarcity — not the particular nature of the crisis or the country in which it occurs. This claim is supported by convergent evidence from non-pandemic settings: fear-of-shortage logic has been documented in supply chain disruptions (Sterman & Dogan, 2015), inflationary episodes (Erdem et al., 2003), and natural disasters (Kulemeka, 2010), all of which exhibit the same underlying appraisal structure — a perceived threat translated into economic concern, which in turn drives stockpiling behavior.

The present findings suggest a testable boundary condition for this mechanism: its strength should scale with country-level economic fragility. Türkiye's macroeconomic environment during data collection—persistent double-digit inflation and currency depreciation—plausibly amplified the socioeconomic mediation pathway beyond what would be expected in more economically stable contexts. This implies that the model is likely to generalize most strongly to other economically vulnerable settings (e.g., countries experiencing high inflation, currency instability, or acute supply disruptions), while potentially showing an attenuated indirect pathway in economically stable, high-income contexts where economic threat is less chronically salient.

This positions the present study's contribution beyond a single-country case study: it offers a portable theoretical mechanism — Fear → Economic Threat Appraisal → Behavioral Response — whose applicability extends to any crisis context characterized by supply uncertainty and economic threat, including future public-health emergencies, commodity shocks, and currency crises. Cross-national replication studies that systematically vary country-level economic indicators (e.g., inflation rate, currency stability, income inequality) are the natural next step to formally establish the scope conditions of this model.

Theoretical Contributions

This study's primary theoretical contribution is the empirical validation of a sequential threat-appraisal model of crisis consumer behavior —Fear → Economic Threat Appraisal → Behavioral Response— which repositions panic buying from a direct emotional reaction to a multi-stage cognitive process in which economic threat perception, not fear itself, is the proximal driver of stockpiling. Building on this framework, the study makes several further contributions to the theoretical literature on crisis consumer behavior.

Most importantly, it provides the first empirically validated, SEM-based evidence that COVID Socioeconomic Consequences partially mediate the relationship between COVID-19 fear and panic buying in the Turkish context. By demonstrating that the indirect effect of fear through socioeconomic worry (B = 0.373) exceeds the direct effect (β = .250), the study advances theoretical models of panic buying beyond simple bivariate fear–behavior associations toward a multi-stage cognitive appraisal architecture. This is consistent with the broader threat appraisal literature (Chua et al., 2021; Omar et al., 2021) and extends it by identifying the specific cognitive content—economic threat—associated with the fear–behavior relationship.

The study also contributes by documenting the boundary conditions of compulsive checking's explanatory power. The null effects across five hypotheses in a chronic pandemic phase suggest that compulsive checking's behavioral relevance may be phase-dependent and appears weaker during prolonged pandemic exposure. This theoretical boundary condition has not been previously demonstrated empirically and points to a temporal moderation hypothesis that future research should test. Similarly, the negligible variance explained in vaccination attitudes (3.7%) contributes to ongoing theoretical debates by empirically distinguishing stable anti-vaccination dispositions from acutely state-dependent crisis behaviors, reinforcing the trait–state framework proposed by Martin and Petrie (2017).

Finally, the study's Turkish context contributes geographic and economic diversity to a literature dominated by samples from Western, economically stable contexts. The strength of the socioeconomic mediation pathway in a high-inflation, economically vulnerable urban environment suggests that the fear–panic buying relationship is not economically invariant and that structural economic conditions may vary its strength. Importantly, this theoretical insight extends beyond the pandemic: the same moderation logic applies to inflationary crises, supply chain disruptions, and future public-health emergencies —any context in which pre-existing economic vulnerability may intensify threat appraisal. Cross-national replication studies that systematically vary country-level economic indicators would substantially advance theoretical understanding of when and why socioeconomic worry mediates panic buying across different crisis types.

Practical Implications

The most direct practical implication is that reducing panic buying requires targeting socioeconomic fears, not merely health fears. If the observed association between COVID-19 fear and panic buying is explained through concerns about grocery shortages, store closures, and medication unavailability, then crisis interventions that directly address supply chain credibility may be among the most promising approaches —consistent with the finding that COVID Socioeconomic Consequences was the strongest predictor of panic buying in this model ($\beta = .593$, $p < .001$).

Governments should prioritize transparent, real-time communication about inventory levels, supply continuity, and pricing controls during crisis periods. In the Turkish context specifically, authorities should consider deploying explicit economic reassurance messaging —directly addressing concerns about inflation, shortages, and access to essential goods— alongside health-focused communications. General behavioral nudges or fear-reduction campaigns that fail to address the economic dimension are unlikely to meaningfully reduce stockpiling behavior.

For retailers, the findings suggest that visible stock rotation practices, prominent in-store and digital signaling of supply availability, and targeted limits on bulk purchasing quantities may reduce panic-buying surges during crisis periods. Retailers who allow shelves to appear depleted —even temporarily— may heighten socioeconomic worry, which is associated with additional purchasing in the present findings. Supply visibility management is therefore not merely a logistical concern but a behavioral one with direct implications for consumer psychology (Schmidt et al., 2021; Taylor, 2021).

Critically, these recommendations are not limited to pandemic contexts. The same supply chain communication and economic reassurance strategies are directly applicable during inflationary episodes —when price expectations are associated with precautionary stockpiling— and during supply disruptions, when perceived scarcity is linked to the fear → socioeconomic worry → panic buying pattern observed in this study. Governments and retailers operating in economically fragile environments should treat panic buying prevention as a standing crisis communication protocol, not merely a pandemic-specific response.

The null effects of vaccination attitudes on panic buying carry an equally important practical message: vaccine hesitancy and panic buying require entirely separate policy responses. Resources allocated to increasing vaccine uptake are unlikely to reduce panic buying, and vice versa. Policymakers and communication professionals should treat these as independent behavioral targets requiring distinct messaging frameworks, channels, and timing strategies.

Conflating them in unified crisis communication campaigns is unlikely to be effective for either outcome, based on the distinct psychological mechanisms suggested by the present findings.

Translating these findings into actionable protocols, Table 6 summarizes concrete intervention points for the three primary stakeholder groups implicated by this study, specifying the responsible actor, the recommended action, and the trigger condition under which it should be activated. This operationalization moves the discussion from general communication principles to specific, implementable crisis-response protocols.

Table 6
Operational Recommendations for Crisis Stakeholders

Actor	Action	Trigger / Timing
National/local government	Publish a public-facing supply and inventory dashboard for essential goods (food, medication, sanitation products), updated every 24–48 hours during a declared crisis period	Activated upon official crisis/emergency declaration
National/local government	Issue explicit economic reassurance communications (e.g., price-stability guarantees, anti-price-gouging enforcement statements) alongside health advisories, rather than as separate or delayed messaging	Issued concurrently with the first public health advisory, not after
Retailers	Implement visible, per-customer purchase limits on high-demand essential items	Activated when in-store inventory of a given essential category falls below a pre-defined threshold (e.g., 20% of standard stock)
Retailers	Maintain visibly full-looking shelves through rapid restocking or shelf-arrangement practices, avoiding prolonged visible depletion	Continuous practice during any period of elevated public concern, not only after shortages are reported
Retailers	Display real-time or near-real-time stock-availability signage (in-store and digital/app-based)	Activated at the onset of a supply-concern signal (e.g., panic-buying-related media coverage or search trends)
Crisis-management institutions	Separate panic-buying mitigation and health-behavior campaigns (e.g., vaccination) into distinct messaging tracks with independent timelines and channels	Standing policy, not crisis-specific

Note: The thresholds and timing intervals presented are illustrative operational examples derived from the study's theoretical framework; implementing institutions should calibrate specific values based on local context and resources.
Source: Own elaboration

Limitations

Several limitations should be acknowledged when interpreting the findings of this study:
First, the cross-sectional design prevents causal inference. Although the theoretical model proposes directionality — Fear → Socioeconomic Consequences → Panic Buying — reverse causality cannot be excluded. Panic buying itself may be associated with heightened socioeconomic fear through supply depletion cues, and socioeconomic worry may be linked to stronger fear perceptions in a reciprocal pattern. This bidirectionality means that the mediation pathway identified here should be interpreted as evidence of association and theoretical consistency rather than an established causal sequence. Longitudinal or

experimental designs are recommended for future research to establish directionality (Creswell & Creswell, 2018; Podsakoff et al., 2003).

Second, online data collection via SurveyMonkey introduced systematic selection bias by excluding older adults and lower-income populations with limited digital access. This is consequential for interpretation: the sample over-represents educated, digitally literate, middle-income urban adults — a group likely to possess greater economic resilience than the broader Istanbul population. This means the socioeconomic mediation effect observed in this study may actually be conservative: in lower-income groups, for whom financial insecurity is more acute, the association between fear, socioeconomic worry, and panic buying may be more pronounced. Additionally, self-report measures carry inherent risks of recall and social desirability bias, which may have led participants to underreport socially stigmatized behaviors such as excessive stockpiling (Lefever et al., 2007).

Third, the VAX Scale (Martin & Petrie, 2017) is a general dispositional instrument not developed for the COVID-19 context, and may not capture situational vaccine attitudes specific to the pandemic period. The extremely low variance explained in vaccination attitudes (3.7%) may therefore partly reflect this measurement limitation rather than a genuine absence of structural relationships. Future research should employ COVID-19-specific vaccination attitude measures to retest these pathways.

Fourth, COVID-19 Compulsive Checking was incorporated on theoretical grounds; however, its null findings may partly reflect multicollinearity with COVID-19 fear — given their high intercorrelation within the COVID Stress Scales ($r = .53–.54$; Taylor et al., 2020a) — rather than a genuine absence of effect, and should be interpreted with caution. Additionally, data were collected in March–April 2021, approximately thirteen months after the pandemic's onset, when compulsive checking may have become habitual and emotionally neutral. These null findings may therefore not generalize to the acute early stages of a crisis, when information novelty is high and compulsive checking is more likely to be associated with heightened anxiety and stronger behavioral responses.

Fifth, the sample is geographically restricted to 300 Istanbul adults recruited via convenience sampling. Istanbul is Türkiye's most economically exposed and densely populated city, meaning the strength of the socioeconomic mediation pathway observed here may not generalize even within Türkiye: consumers in smaller cities or rural areas, with different economic exposures and supply chain experiences, may exhibit weaker or differently patterned associations. More broadly, the findings reflect Türkiye's specific macroeconomic conditions — persistent inflation and currency depreciation — and the socioeconomic mediation effect may be attenuated in more economically stable national contexts. Cross-

national replication using probability sampling is necessary to establish the generalizability of these findings (Hair et al., 2010; Etikan et al., 2016).

Future studies should employ probability sampling, longitudinal designs, broader geographic coverage, and COVID-19-specific measures of vaccination attitudes to address these limitations and further consolidate the conclusions of this study.

CONCLUSIONS

This study examined the psychological and socioeconomic drivers of panic buying among Turkish consumers during the COVID-19 pandemic, with particular focus on the mediating roles of COVID Socioeconomic Consequences and vaccination attitudes. Using structural equation modeling (SEM) with data collected from 300 Istanbul residents in March–April 2021, the model explained 53.9% of the variance in panic buying behavior — a level of explanatory power that is notable within the behavioral research literature.

The central finding of this study is that COVID-19 fear does not appear as a simple, direct antecedent of panic buying. Instead, the strongest observed association between fear and stockpiling was explained through socioeconomic worry — specifically, concerns about grocery shortages, store closures, and medication unavailability. The indirect effect of COVID-19 fear on panic buying via COVID Socioeconomic Consequences ($B = 0.373$, 95% CI [0.166, 0.603], $p = .001$) exceeded the direct effect ($\beta = .250$), supporting partial mediation and suggesting that panic buying may be better understood as a cognitively mediated, economically informed response rather than a purely impulsive or irrational behavior. COVID Socioeconomic Consequences also emerged as the strongest direct predictor of panic buying in the model ($\beta = .593$, $p < .001$), substantially outpacing the direct fear effect in magnitude.

These results carry particular interpretive weight in the Turkish urban context. Istanbul consumers in 2021 were already navigating persistent inflation and a depreciating currency, meaning that even moderate COVID-19 fear was associated with acute concerns about supply access and price stability. As discussed in Section 5.5, this structural economic vulnerability likely strengthened the socioeconomic mediation pathway beyond what would be observed in more economically stable settings, and the underlying mechanism is theoretically applicable to crisis contexts well beyond the COVID-19 pandemic.

Contrary to theoretical expectations, COVID-19 Compulsive Checking failed to predict any outcome variable in the model. Once COVID-19 fear was controlled for, compulsive checking contributed no unique explanatory variance to socioeconomic worry, vaccination

attitudes, or panic buying. This pattern of null findings — consistent across all five related hypotheses — suggests that by the chronic phase of the pandemic, repetitive news-monitoring had become habitual and emotionally neutral, and may no longer be associated with anxiety amplification at this stage of the crisis. Future research should test whether compulsive checking exerts stronger behavioral effects during the acute early stages of a crisis, when information is novel, and uncertainty is at its peak —a temporal moderation hypothesis with implications beyond pandemic contexts.

Vaccination attitudes, measured via the dispositional VAX Scale, showed no significant relationship with panic buying ($\beta = -.091$, $p = .069$) and did not mediate any pathway in the model. This finding underscores a theoretically important distinction: anti-vaccination beliefs are stable, trait-like dispositions formed over years of socialization, whereas panic buying is an acutely state-dependent behavioral response to perceived scarcity. These two phenomena, while both prominent during the COVID-19 pandemic, reflect fundamentally different psychological mechanisms and require entirely separate policy responses. Interventions effective at reducing stockpiling are unlikely to predictably affect vaccine hesitancy, and vice versa — a distinction that remains equally relevant in future public-health crises.

From a practical standpoint, the findings suggest that governments and retailers seeking to mitigate panic buying during future crises — whether pandemic-related, inflationary, or supply-chain-driven — should prioritize transparent, real-time communication about supply availability and pricing rather than relying solely on health-focused messaging. Strategies that directly address economic fears — such as explicit reassurances regarding inventory levels, anti-price-gouging measures, and visible stock rotation in stores — may represent promising approaches for preventing excessive purchasing across crisis types. Unified crisis communication campaigns that conflate panic buying with vaccine hesitancy are unlikely to address either behavior optimally.

In summary, this study advances the panic buying literature by providing the first SEM-based empirical evidence from Türkiye that socioeconomic worry is the critical mediating mechanism linking COVID-19 fear to stockpiling behavior. The findings suggest panic buying as a rationally motivated, cognitively mediated response to anticipated economic disruption — a pattern consistent with structural economic vulnerabilities and one that may emerge in future crises of uncertainty. Future research should address the study's limitations through longitudinal designs, probability sampling, broader geographic coverage, and COVID-19-specific measures of vaccination attitudes to further consolidate and extend these conclusions.

DECLARATIONS

Conflicts of Interest Declaration: The author declares that he has no conflicts of interest.

Author Contributions: The author was solely responsible for conceptualization, methodology, formal analysis, writing—original draft, writing—review and editing.

Declaration of Generative AI and AI-Assisted Technologies: During the preparation of this manuscript, the author used Grammarly for language and grammar checking. The author reviewed and approved the final version of the manuscript.

Informed Consent Declaration: All participants involved in this study were fully informed about the purpose and procedures of the research. Participation was entirely voluntary, and participants had the right to withdraw from the study at any time without any consequences. Before data collection, all participants provided informed consent. They were assured that their responses would remain confidential and anonymous, and that the collected data would be used solely for academic and research purposes. No personal identifying information was collected, and all data were handled in accordance with ethical research standards.

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Appendix:

Table. 7 Measurement Scales, Items, and APA References

No	Scale Name	Scale Items	In-text Citation
1. Fear of COVID-19 Scale | 7 items | 5-point Likert			
1	**1. Fear of COVID-19 Scale** *(Ahorsu et al. (2022)*	I am most afraid of coronavirus-19.	*Ahorsu et al. (2022)*
2		It makes me uncomfortable to think about coronavirus-19.	
3		My hands become clammy when I think about coronavirus-19.	
4		I am afraid of losing my life because of coronavirus-19.	
5		When watching news and stories about coronavirus-19 on social media, I become nervous or anxious.	
6		I cannot sleep because I'm worrying about getting coronavirus-19.	
7		My heart races or palpitates when I think about getting coronavirus-19.	
APA Reference: Ahorsu, D. K., Lin, C. Y., Imani, V., Saffari, M., Griffiths, M. D., & Pakpour, A. H. (2022). The fear of COVID-19 scale: Development and initial validation. International Journal of Mental Health and Addiction, 20(3), 1537–1545. https://doi.org/10.1007/s11469-020-00270-8			
2. COVID-19 Compulsive Checking Scale | 6 items | 5-point Likert | Subscale of CSS — used independently			
8	**2. COVID-19 Compulsive Checking Scale** *(Taylor et al. (2020a)*	Searched the Internet for treatments for COVID-19.	*Taylor et al. (2020a)*
9		Asking health professionals (e.g., doctors or pharmacists) for advice about COVID-19.	
10		YouTube videos about COVID-19.	
11		Checking your own body for signs of infection (e.g., taking your temperature).	
12		Seeking reassurance from friends or family about COVID-19.	
13		Social media posts concerning COVID-19.	
APA Reference: Taylor, S., Landry, C. A., Paluszek, M. M., Fergus, T. A., McKay, D., & Asmundson, G. J. G. (2020). Development and initial validation of the COVID Stress Scales. Journal of Anxiety Disorders, 72, 102232. https://doi.org/10.1016/j.janxdis.2020.102232			
3. COVID Socioeconomic Consequences Scale | 6 items | 5-point Likert | Subscale of CSS — used independently			
14	**3. COVID Socioeconomic Consequences Scale** *(Taylor et al. (2020a)*	I am worried about grocery stores running out of food.	*Taylor et al. (2020a)*
15		I am worried that grocery stores will close down.	
16		I am worried about grocery stores running out of cleaning or disinfectant supplies.	
17		I am worried about grocery stores running out of cold or flu remedies.	
18		I am worried about grocery stores running out of water.	
19		I am worried about pharmacies running out of prescription medicines.	
APA Reference: Taylor, S., Landry, C. A., Paluszek, M. M., Fergus, T. A., McKay, D., & Asmundson, G. J. G. (2020). Development and initial validation of the COVID Stress Scales. Journal of Anxiety Disorders, 72, 102232. https://doi.org/10.1016/j.janxdis.2020.102232			
4. Vaccination Attitudes Examination (VAX) Scale | 12 items | 5-point Likert | (–) = reverse-scored items			
20	**4. Vaccination Attitudes Examination (VAX) Scale** *(Martin & Petrie (2017)*	I feel safe after being vaccinated. (–)	*Martin & Petrie (2017)*
21		I can rely on vaccines to stop serious infectious diseases. (–)	

22		I feel protected after getting vaccinated. (–)	
23		Although most vaccines appear to be safe, there may be problems that we have not yet discovered.	
24		Vaccines can cause unforeseen problems in children.	
25		I worry about the unknown effects of vaccines in the future.	
26		Vaccines make a lot of money for pharmaceutical companies, but do not do much for regular people.	
27		Authorities promote vaccination for financial gain, not for people's health.	
28		Vaccination programs are a big con.	
29		Natural immunity lasts longer than a vaccination.	
30		Natural exposure to viruses and germs gives the safest protection.	
31		Being exposed to diseases naturally is safer for the immune system than being exposed through vaccination.	
APA Reference: Martin, L. R., & Petrie, K. J. (2017). Understanding the dimensions of anti-vaccination attitudes: The Vaccination Attitudes Examination (VAX) Scale. Annals of Behavioral Medicine, 51(5), 652–660. https://doi.org/10.1007/s12160-017-9888-y			
5. Panic Buying Scale During COVID-19 | 7 items | 5-point Likert			
32	**5. Panic Buying Scale During COVID-19** *(Lins & Aquino (2020)*	Fear drives me to buy things to stock at home.	*Lins & Aquino (2020)*
33		The fear of not having the products that I need leads me to buying more things.	
34		I panic when I think that essential products may run out from the shelves, so, that is why I prefer to buy them in bulk.	
35		Fear drives me to buy more than I usually do.	
36		Panic makes me buy more things than I usually do.	
37		One way to relieve the feeling of uncertainty is to make sure that I have a good amount of the products that I need at home.	
38		The feeling of uncertainty influences my buying habits.	
APA Reference: Lins, S., & Aquino, S. (2020). Development and initial psychometric properties of a panic buying scale during COVID-19 pandemic. Heliyon, 6(9), e04746. https://doi.org/10.1016/j.heliyon.2020.e04746			

Note. (–) = reverse-scored item. All scales use a 5-point Likert response format.

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Technological Adoption and Structural Transformation in Mexican Family-Owned High-Frequency Retail Stores

Adopción tecnológica y transformación estructural en tiendas minoristas de alta frecuencia de propiedad familiar en México

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ABSTRACT

This study analyses how technological adoption contributes to the structural transformation of family-owned High-Frequency Retail Stores in Mexico. The study used a quantitative survey administered to 126 High-Frequency Stores in the Guadalajara Metropolitan Area. Data were analyzed using Structural Equation Modeling (SEM). The study shows that these stores operate at an equilibrium between tradition and modernization, where technology does not replace the family model but transforms it. The lower level of digital literacy, compared with the high perception of business performance, confirms that their current strength remains rooted in social relationships, informal governance, and close customer interaction, while technological adoption represents the next stage in their structural evolution. Thus, the title connects directly with the central finding: High-Frequency Stores are transitioning from a purely relational model to a hybrid one, in which family businesses progressively integrate digital capabilities without losing their community essence, redefining the future of Mexican retail through resilience, social inclusion, and gradual innovation.

Keywords: Digital transformation; Family business; Technology adoption; Retail digitalization; Organizational resilience; SME.

Jel Code: L22, L81, O33

RESUMEN

Este estudio analiza cómo la adopción tecnológica contribuye a la transformación estructural de los comercios minoristas de alta frecuencia de propiedad familiar en México. La investigación empleó una encuesta cuantitativa aplicada a 126 de dichos establecimientos en la Zona Metropolitana de Guadalajara. Los datos se analizaron mediante modelos de ecuaciones estructurales (SEM). El estudio revela que estos comercios operan en un equilibrio entre tradición y modernización, en el que la tecnología no sustituye al modelo familiar, sino que lo transforma. El menor nivel de alfabetización digital, frente a la percepción positiva del desempeño empresarial, confirma que su fortaleza actual sigue arraigada en las relaciones sociales, la gobernanza informal y la interacción cercana con el cliente, mientras que la adopción tecnológica representa la siguiente etapa de su evolución estructural. Así, el título conecta directamente con el hallazgo central: los comercios de alta frecuencia están transitando de un modelo puramente relacional a uno híbrido, en el que las empresas familiares integran progresivamente capacidades digitales sin perder su esencia comunitaria, redefiniendo el futuro del comercio minorista mexicano a través de la resiliencia, la inclusión social y la innovación gradual.

Palabras clave: Transformación digital; Empresa familiar; Adopción de tecnología; Digitalización del comercio minorista; Resiliencia organizacional; PYME.

Código JEL: L22, L81, O33.

INTRODUCTION

High-Frequency Stores (HFS), commonly known as tienditas or neighborhood stores, constitute one of the most important components of the Mexican retail sector. Typically operated as family-owned microenterprises, they provide essential goods while generating employment and income for millions of households. Despite the rapid expansion of supermarkets, convenience store chains, and digital commerce, these businesses continue to maintain a strong market presence through customer proximity, trust, and personalized service (López & David, 2020). Their dual role as economic units and socially embedded organizations makes them highly relevant for understanding how family businesses adapt to increasingly digital and competitive environments.

The concept of High-Frequency Stores originates from industry practice rather than academic literature. Procter & Gamble (P&G) introduced the term to describe neighborhood stores that constitute a principal distribution channel for consumer goods across Latin America and other developing markets (P&G, Annual Report, 2009). These businesses typically operate as small family-owned retail units—including bodegas, kiosks, and traditional "mom-and-pop" stores—characterized by frequent customer visits and strong local community ties. P&G estimates that approximately one million High-Frequency Stores operate across Latin America (MIT Startup Exchange, 2023). In Mexico, they represent approximately 26% of all retail establishments, highlighting their continued economic and social relevance despite profound structural changes in the retail sector.

Although High-Frequency Stores have traditionally relied on family participation, proximity, and community trust as their principal competitive advantages, they are increasingly challenged by digitalization and changing consumer expectations (Wulandari et al., 2025). Previous research shows that family businesses often resist technological change because of financing constraints, dependence on established routines, and risk aversion (Lannon et al., 2023; Larios & Maciel, 2017).

Similar challenges have been identified among small and medium-sized enterprises in emerging economies, where digital technologies remain underutilized despite their recognized contribution to competitiveness and organizational performance (Castro et al., 2018; Zapata et al., 2022; Gress et al., 2025). Consequently, understanding the factors that facilitate or constrain the adoption of Information and Communication Technologies (ICT) has become increasingly important for explaining the transformation of traditional retail microenterprises (Castro et al., 2018; Gress et al., 2025).

In this context, digital transformation extends beyond adopting technological tools; it is a broader organizational process in which technological capabilities interact with family relationships, governance structures, and managerial competencies. High-Frequency Stores are characterized by personalized customer service, localized market knowledge, and operational flexibility, where competitiveness depends not only on prices but also on trust, familiarity, and customer experience (González et al., 2023). Understanding purchasing behavior within this environment requires recognizing how customer interactions are increasingly influenced by digital technologies, making digital literacy and technological adoption essential capabilities for strengthening customer engagement and business performance (Bülbül et al., 2026).

LITERATURE REVIEW

Family firms are profoundly shaped by their familiness and core values, which frequently leads them to privileged agility and pragmatism over formalized strategic planning (Bouncken & Schmitt, 2022). This familiness generates distinctive patterns of innovativeness, since the interaction between family involvement in ownership, governance, and management directly conditions both the willingness and the ability to pursue digital transformation strategies that are increasingly essential for survival in the digital era (Costa et al., 2023). However, family firms are far from homogeneous. Their heterogeneity plays a decisive role in shaping digital adoption trajectories: while some enterprises exploit their long-term orientation and the inclusion of non-family management to cultivate innovative digital capabilities, others remain constrained by rigid mental models and centralized authority that limit openness to external knowledge and emerging technologies (Bornhausen & Wulf, 2023; Bouncken et al., 2025).

This tension is commonly explained through the ability and willingness paradox, which suggests that although family firms often possess the resources, slack capacity, and long-term stability required to innovate, they may lack the strategic intent to adopt digital technologies due to risk aversion and the imperative to preserve socioemotional wealth (Bornhausen & Wulf, 2023). This paradox is reinforced by the fact that family firms frequently have the financial and organizational ability to innovate, yet their willingness is tempered by concerns over control, identity preservation, and intergenerational continuity (Appleton et al., 2025; Bornhausen & Wulf, 2023).

Specific barriers include paternalistic decision-making styles, fragmented or inconsistent understandings of digital transformation, and employee resistance, while key drivers include cash opportunities, early success stories, and a clearly articulated digital strategy (Bornhausen & Wulf, 2023). Consequently, many resource-constrained small and medium-

sized family firms adopt a reactive, pragmatic-incremental approach to digital transformation, characterized by low levels of strategic planning and a strong attachment to traditional practices (Bouncken & Schmitt, 2022; Costa et al., 2023).

This cautious stance is further intensified by the distinctive nature of digital innovation itself, which is marked by rapid technological change, generativity, and high complexity. These features amplify perceived uncertainty and risk, particularly for family owners whose primary objective is preserving transgenerational control and organizational identity (Bornhausen & Wulf, 2023; Costa et al., 2023). Research shows that family managers strongly prefer to retain decision-making authority, and the fear of losing control often translates into a reluctance to collaborate technologically with external partners or to acquire advanced digital technologies (Bornhausen & Wulf, 2023). Ironically, this reluctance persists even though family firms typically exhibit a high ability to govern collaborative relationships, suggesting that willingness, rather than capability, is the binding constraint (Bornhausen & Wulf, 2023; Guenther et al., 2022).

In increasingly competitive markets, however, small and medium-sized enterprises must adapt their strategies to respond to heightened uncertainty and evolving consumer demands, a process that can be effectively supported through the adoption of new technologies (Singh, 2025). Despite their economic and social relevance, the least competitive firms within the retail ecosystem are micro-grocery enterprises. Because of their size and structural characteristics, these businesses are typically oriented toward domestic markets, rely on traditional technologies, generate low levels of added value, and face persistent difficulties accessing credit, training, and economies of scale (Oktaryani, 2026; Sezer et al., 2026).

Successfully introducing, adopting, and using digital technologies require not only financial investment but also innovative skills and competencies, implying a coevolutionary process among human capital, organizational learning, innovation, and digital technologies (Costa et al., 2023). Digital transformation thus presents a unique strategic dilemma for family firms, creating tension between extending traditional business models and embracing new digital processes that challenge established routines and power structures (Bouncken & Schmitt, 2022).

Accordingly, the digital transformation of family-owned enterprises demands a comprehensive understanding of how technological integration interacts with entrenched organizational structures and cultural norms (Gunawan et al., 2023). This interaction is especially salient in family firms, where prioritizing family-centered goals can significantly moderate the positive performance effects typically associated with business information technology alignment (Issah & Calabrò, 2024).

Empirical evidence increasingly demonstrates that the adoption of digital technologies by ultra-micro, micro, and small enterprises has a significant and positive impact on business performance, improving both operational efficiency and financial outcomes (Affandi et al., 2024). Moreover, digital adoption contributes to enhanced owners' financial literacy, indicating that its benefits extend beyond immediate productivity gains to broader developmental outcomes (Affandi et al., 2024). Nevertheless, realizing these benefits requires strategically reconfiguring internal resources and business processes to create value and adapt to evolving digital business models (Kusumawardhani et al., 2023). Within this framework, digital entrepreneurship—characterized by flexible, less-bounded processes and outcomes—empowers firms to explore new market niches and strengthen their organizational structures (Rodriguez et al., 2022).

Digital competence is central to this process. It encompasses the ability to conduct online searches, critically evaluate information, and effectively use mobile devices for diverse business functions, including marketing, procurement, communication, and customer service (Kusumawardhani et al., 2023). Digital literacy also extends to practical domains such as digital consumption, through which firms leverage digital technologies for information access, service provision, and relational coordination (Kusumawardhani et al., 2023; Singh, 2025). In an increasingly interconnected global economy, digital literacy becomes indispensable for reducing operational costs, improving efficiency, and fostering organizational flexibility in response to shifting consumer expectations (Rodriguez et al., 2022). Consequently, developing robust managerial and operational digital capabilities is essential to improving business performance in dynamic environments (Noviaristanti & Boon, 2022).

This imperative is particularly pronounced for nanostores and family-run microenterprises, which operate under severe resource constraints and rely heavily on family involvement in daily operations. For these firms, digital literacy becomes a critical determinant of competitive capacity and long-term sustainability (Sutisna et al., 2025; Kusumawardhani et al., 2023). Furthermore, the interplay between digital literacy and entrepreneurial success suggests that effectively integrating digital skills can catalyze innovation, efficiency, and market expansion (Çallı et al., 2022). Such integration is vital for developing new business models and achieving sustainable economic growth, especially in emerging economies where digital transformation remains uneven and fragmented (Rodriguez et al., 2022).

At the micro-foundational level, managerial digital literacy has been identified as a key driver of digital transformation in small and medium-sized enterprises, shaping both the scope and quality of technology adoption (Zahoor et al., 2023). However, despite its acknowledged importance, a significant gap persists in understanding the specific conditions under which managerial digital literacy effectively translates into improved firm outcomes (Zahoor et al.,

2023). This gap is particularly salient in family firms, where socioemotional wealth considerations, governance structures, and intergenerational dynamics can either amplify or constrain the strategic value of digital capabilities (Worek & Aaltonen, 2025).

Within this broader debate, High-Frequency Stores occupy a distinctive position at the intersection of family enterprise and community resilience. Prior research emphasizes their dual function as economic actors and social institutions that sustain livelihoods and reinforce social cohesion (Beltrán, 2019; BeLue et al., 2019). Family Embeddedness Theory further explains how entrepreneurial behavior in these contexts is deeply shaped by family relationships, norms, and emotional investments (Aldrich & Cliff, 2003).

High-Frequency Stores thus exemplify how informal governance structures and intergenerational collaboration generate unique strategic advantages in localized economies. Internationally, scholars have shown that these stores remain essential components of last-mile distribution systems in emerging markets (Blanco & Fransoo, 2013; Paswan et al., 2010). Yet, they also face persistent challenges, including digital exclusion, restricted access to credit, and intensifying competition from modern retail formats (Eakin et al., 2025).

Taken together, the literature reveals a complex and paradoxical landscape in which family firms—and particularly High-Frequency Stores—possess both the capacity and the structural constraints to engage in digital transformation. While familiness provides flexibility, trust, and long-term orientation, it simultaneously reinforces risk aversion, control preservation, and resistance to external knowledge.

Digital literacy and managerial competence emerge as critical levers that can resolve, or at least moderate, this paradox by transforming digital technologies into strategic resources rather than perceived threats. The literature therefore underscores a pressing need for empirical evidence that explicitly connects family dynamics, digital capability development, and performance outcomes. Addressing this gap is essential for advancing both theory and practice, and it constitutes the central objective of the present study.

CONCEPTUAL FRAMEWORK AND RESEARCH MODEL

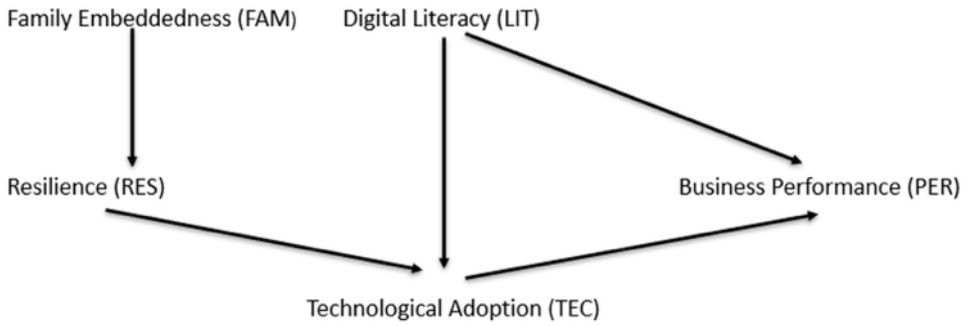
Before presenting the reliability results, it is important to contextualize the role of measurement validation within this study's analytical strategy. Given that the central objective is to examine the structural relationships between family embeddedness, digital literacy, technological adoption, and business performance, ensuring the internal consistency and psychometric robustness of each construct is a critical prerequisite. Reliable

measurement instruments are essential to guarantee that the observed relationships reflect genuine theoretical mechanisms rather than artifacts of scale construction or item ambiguity.

In this sense, assessing internal consistency through Cronbach's alpha serves a dual purpose. First, it confirms that the selected items adequately capture the multidimensional nature of each construct within the specific context of High-Frequency Stores. Second, it provides empirical assurance that the survey instrument is suitable for subsequent structural modeling and hypothesis testing. Given the informal and family-centered nature of these enterprises, validating constructs such as family embeddedness and digital literacy is particularly relevant, as these dimensions are often difficult to operationalize in standardized quantitative terms.

Accordingly, Table 1 reports the reliability statistics and descriptive measures for each construct, offering an initial quantitative portrait of the balance between social capital, technological adoption, and digital competence in Mexican High-Frequency Stores. Figure 1 illustrates the proposed conceptual framework in which family embeddedness is primarily associated with organizational resilience, while digital literacy enables technological adoption and directly enhances business performance. Technological adoption functions as a mediating mechanism through which both social and digital resources are transformed into competitive outcomes.

Figure 1
Conceptual model of resilience and performance in High-Frequency Stores: the mediating role of technological adoption



Source: Own elaboration.

The results in Table 1 provide initial empirical confirmation of the hybrid nature of High-Frequency Stores. On the one hand, the high mean values observed for Family Embeddedness (M = 7.45) and Business Performance (M = 7.42) indicate that these enterprises remain strongly rooted in family cohesion, shared ownership, and positive self-perceptions of economic stability. This reinforces the conceptualization of HFS as organizations whose resilience is primarily sustained by social and emotional capital rather than by formalized technological infrastructures.

On the other hand, the comparatively lower mean score for Digital Literacy (M = 5.84) reveals a structural asymmetry between social embeddedness and technological competence. While owners perceive themselves as successful in relational and economic terms, their digital capabilities remain uneven and underdeveloped. This gap illustrates that technological modernization is still in an intermediate stage, where digital tools are partially adopted but not yet fully integrated into strategic and operational decision-making processes.

Similarly, the intermediate value of Technological Adoption (M = 6.94) suggests that High-Frequency Stores are engaging in selective and pragmatic forms of digitalization—such as electronic payments, POS systems, and basic social media use—without having transitioned toward a comprehensive digital strategy. This pattern is consistent with a gradual, necessity-driven transformation rather than a proactive, systematically planned one.

Together, these descriptive results anticipate the paper's central argument: High-Frequency Stores operate as hybrid systems in which family embeddedness ensures continuity and stability, while digital literacy and technological adoption act as emerging but uneven enablers of future competitiveness. The table thus does more than validate measurement reliability; it empirically illustrates the structural tension between tradition and innovation that defines the ongoing evolution of the family business model in Mexican informal retail.

Research Question 3 and Hypotheses Development

This study proposes that digital literacy not only directly influences business performance but also operates indirectly through the adoption of digital technologies. In micro and family-owned retail contexts, managerial digital literacy represents a foundational capability that enables owners to understand, select, and effectively implement technological tools. However, digital competence alone does not automatically translate into improved performance unless it is transformed into concrete technological practices embedded in daily operations.

Accordingly, technological adoption is conceptualized as a mediating mechanism through which digital literacy is converted into observable competitive outcomes. This perspective aligns with the view that technological resources generate value only when they are actively deployed and integrated into organizational processes, decision-making routines, and customer interaction channels. In High-Frequency Stores, this includes digital payment systems, POS technologies, digital inventories, and communication platforms, all of which can enhance efficiency, customer engagement, and operational control.

From this perspective, the following research question is formulated.

RQ1: *Does technological adoption mediate the relationship between digital literacy and business performance in High-Frequency Stores?*

To address this question empirically, three hypotheses are proposed. First, consistent with digital transformation and SME performance literature, the adoption of digital technologies is expected to positively affect business performance, as technology improves efficiency, responsiveness, and market competitiveness.
H1: *Technological Adoption positively influences Business Performance.*

Second, digital literacy is expected to directly affect business performance, as digitally competent owners are better equipped to make informed strategic decisions, manage customer relationships, and optimize operational processes beyond the mere use of specific technologies.

H2: *Digital Literacy has a direct positive effect on Business Performance.*

Finally, and most importantly, technological adoption is expected to function as a mediating variable between digital literacy and business performance. This implies that part of the effect of digital literacy on performance operates through its capacity to enable and intensify the adoption of digital tools, which then translate into improved organizational outcomes.

H3: *Technological Adoption mediates the relationship between Digital Literacy and Business Performance*.

RESEARCH DESIGN AND METHODOLOGY

This study adopts a quantitative cross-sectional explanatory research design to analyze the relationships among family embeddedness, digital literacy, technological adoption, and business performance in Mexican High-Frequency Stores (HFS). The quantitative approach was selected because it enables the empirical examination of causal relationships among latent constructs and facilitates the statistical validation of the proposed conceptual model through Structural Equation Modeling (SEM). This approach is particularly suitable for analyzing complex interactions among technological capabilities, family dynamics, and organizational outcomes in small family-owned enterprises operating in emerging retail environments (Zahoor et al., 2023).

The study focused on family-owned High-Frequency Stores (HFS) located in the Guadalajara Metropolitan Area (GMA), Mexico. Given the absence of an official census of High-Frequency Stores, the study adopted a non-probability convenience and snowball sampling strategy.

Fieldwork was conducted between March and June 2025 through face-to-face visits by the research team, composed of faculty members and trained undergraduate researchers. During each visit, the study objectives were explained to store owners or managers, confidentiality and anonymity were guaranteed, and voluntary informed consent was obtained before administering the questionnaire.

A total of 207 High-Frequency Stores were contacted. Of these, 147 agreed to participate, representing a response rate of 71%. Subsequently, 21 questionnaires were excluded because they contained incomplete responses or inconsistent answer patterns that could compromise the quality of the statistical analyses. Consequently, the final analytical sample consisted of 126 valid questionnaires, which were retained for all subsequent analyses. The survey instrument was administered personally to the owner or manager of each participating store, ensuring that responses were provided by individuals directly involved in the operational and strategic management of the business.

Family Embeddedness was measured through items associated with family participation in ownership, operational involvement, and decision-making processes. Digital Literacy evaluated the owners' perceived digital competencies related to the use of digital tools, information management, and technological problem-solving. Technological Adoption assessed the implementation of digital systems such as electronic payment platforms, point-of-sale systems, social media usage, and digital communication tools. Business Performance captured perceived operational and commercial outcomes, including customer growth, operational efficiency, and sales stability.

The quantitative design facilitates identifying key challenges and opportunities associated with digitalization in High-Frequency Stores, addressing the need for contextualized diagnostic models for Mexican SMEs (Encinas et al., 2024). Furthermore, the study examines how the adoption of digital technologies—often constrained by financial and organizational limitations—depends critically on store owners' digital literacy levels (Amaya et al., 2024; Kusumawardhani et al., 2023). The model also considers the role of tacit knowledge and operational learning processes that characterize microenterprises and influence digital capability development (Crespo et al., 2020).

Data were analyzed using Structural Equation Modeling (SEM), which enabled the simultaneous examination of both direct and indirect relationships among the latent variables. SEM provides a robust analytical framework for testing complex causal structures and evaluating how managerial digital literacy functions as a micro-foundation for digital transformation in family-owned microenterprises (Zahoor et al., 2023). The structural model specifically examined the effects of Digital Literacy and Technological Adoption on Business Performance, as well as the mediating role of Technological Adoption between Digital Literacy and Business Performance.

To evaluate the measurement model's reliability and validity, multiple statistical procedures were conducted. Internal consistency was assessed using Cronbach's alpha and Composite Reliability (CR), while convergent validity was evaluated through Average Variance Extracted (AVE) and standardized factor loadings. Discriminant validity was assessed using the Heterotrait-Monotrait ratio (HTMT). Cronbach's alpha coefficients for all constructs exceeded the recommended threshold of 0.70, confirming strong internal consistency across the measurement instrument.

Measurement model assessment

The measurement model was assessed through standardized outer loadings, Cronbach's alpha, Composite Reliability (CR), Average Variance Extracted (AVE), and the Heterotrait–Monotrait ratio (HTMT). The analysis used 126 complete cases across the four reflective constructs: Family Embeddedness (FAM), Technological Adoption (TEC), Business Performance (PER), and Digital Literacy (LIT).

All standardized outer loadings exceeded the recommended threshold of 0.70, ranging from 0.814 to 0.957, supporting adequate indicator reliability. Composite Reliability values ranged from 0.926 to 0.971, while AVE values ranged from 0.757 to 0.892, exceeding the recommended cut-off values of 0.70 and 0.50, respectively. These results confirm satisfactory internal consistency and convergent validity (Table 1). Discriminant validity was evaluated using the HTMT criterion. All HTMT values were below the conservative threshold of 0.85. The highest value was observed between Technological Adoption and Digital Literacy (HTMT = 0.626), which remains well below the recommended limit. Therefore, the constructs demonstrate adequate discriminant validity. See Table 2.

Table 1
Reliability and Convergent Validity (α, CR, AVE)

Construct	Cronbach's alpha	Composite Reliability (CR)	Average Variance Extracted (AVE)	Decision
FAM	0.892	0.926	0.757	Adequate (CR>0.70; AVE>0.50)
TEC	0.929	0.949	0.825	Adequate (CR>0.70; AVE>0.50)
PER	0.951	0.965	0.874	Adequate (CR>0.70; AVE>0.50)
LIT	0.959	0.971	0.892	Adequate (CR>0.70; AVE>0.50)

Source: Own elaboration.

Table 2
HTMT Discriminant Validity Matrix

Columna1	FAM	TEC	PER	LIT
FAM	1	0.033	0.294	0.057
TEC	0.033	1	0.428	0.626
PER	0.294	0.428	1	0.302
LIT	0.057	0.626	0.302	1

Source: Own elaboration.

We used bootstrapping with 5,000 resamples to evaluate the statistical significance of the structural path coefficients, indirect (mediating) effects, and confidence intervals. This non-parametric resampling procedure provides robust estimates of standard errors, t-values, p-values, and bias-corrected 95% confidence intervals, allowing assessment of the statistical significance of the proposed hypotheses without assuming multivariate normality.

In addition, the explanatory and predictive capabilities of the structural model were evaluated using the coefficient of determination (R^2), effect sizes (f^2), and predictive relevance (Q^2), following current recommendations for PLS-SEM analysis. Together, these indicators provide a comprehensive assessment of the magnitude, significance, explanatory power, and predictive performance of the proposed model. Table 3 presents the complete bootstrapping results for the structural model.

Table 3
Bootstrapping Paths

Path	β	SE	t-value	p-value	CI 2.5%	CI 97.5%	Decision
LIT -> TEC	0.5912	0.0613	9.6465	0	0.4607	0.7007	Supported
TEC -> PER	0.3567	0.1238	2.8808	0.0047	0.1103	0.5992	Supported
LIT -> TEC -> PER	0.0775	0.1247	0.6215	0.5354	-0.1764	0.3101	Not supported

Source: Own elaboration.

Bootstrapping analysis indicated that the indirect effect associated with H3 was not statistically significant ($p > .05$; 95% CI included zero). Therefore, the proposed mediation hypothesis (H3) was not supported. These findings suggest that, although the direct relationships were significant, the mediating mechanism proposed in the conceptual model was not confirmed.

Because all variables were collected from the same respondents using a single survey instrument, several procedural and statistical remedies were implemented to mitigate the potential influence of common method bias (CMB). Procedurally, respondents were assured of anonymity and confidentiality, participation was voluntary, and the purpose of the study was clearly explained before questionnaire administration, thereby reducing evaluation apprehension and social desirability bias.

Statistically, Harman's single-factor test indicated that no single factor accounted for the majority of the total variance. In addition, full collinearity variance inflation factors (VIFs) were examined for all latent constructs. All VIF values were below the recommended threshold of 3.3, suggesting that common method bias is unlikely to represent a dominant source of variance in the present study (Table 4). Nevertheless, as with any cross-sectional self-reported survey, the possibility of residual common method variance cannot be completely ruled out.

This methodological design provides a statistically robust framework for examining how family embeddedness, digital literacy, and technological adoption jointly influence business performance and organizational transformation in Mexican High-Frequency Stores. By focusing exclusively on quantitative evidence, the study offers empirically verifiable insights into the role of digital capabilities in strengthening the competitiveness and resilience of family-run retail micro-enterprises in emerging economies.

Table 4
Full Collinearity VIF Values

Construct	Full Collinearity VIF
FAM	1.28
TEC	1.61
PER	1.44
LIT	1.57

Source: Own elaboration.

RESULTS

Correlation Analysis

To further explore the relationships among the key constructs, a Pearson correlation matrix was computed (Table 5). The results indicate significant associations between technological adoption (TEC), digital literacy (LIT), and business performance (PER). In particular, TEC shows strong positive correlations with LIT ($r = 0.635$) and PER ($r = 0.483$). Conversely, family embeddedness (FAM) exhibits weaker correlations with the technological and performance variables.

Table 5
Pearson Correlation Matrix among Key Constructs (FAM, TEC, PER, and LIT)

	FAM	TEC	PER	LIT
FAM	1	0.064	0.268	0.023
TEC	0.064	1	**0.483**	**0.635**
PER	0.268	**0.483**	1	**0.387**
LIT	0.023	**0.635**	**0.387**	1

Source: The authors with survey data

The average variance extracted and composite reliability values for all constructs surpassed the 0.50 and 0.70 thresholds, respectively, affirming the convergent validity and internal consistency of the measurement model (Riadi et al., 2023). The measurement model demonstrated satisfactory psychometric properties, with strong internal consistency, convergent validity, and discriminant validity across all constructs.

These robust psychometric properties validate the instrument's ability to accurately measure the theoretical constructs, thereby ensuring the reliability of subsequent structural model analyses. This rigorous validation supports confident interpretation of the relationships between family embeddedness, digital literacy, and business performance in Mexican High-Frequency Stores, providing a strong basis for theoretical and practical implications. This strict assessment confirms that the latent variables are well-represented by their observed indicators, supporting the suitability of the data for advanced statistical modeling (Khlaif et al., 2024). Furthermore, the robust discriminant validity, evidenced by the square root of the average variance exceeding inter-construct correlations, confirms that each construct is distinct and measures unique aspects of the theoretical framework (Maisela, 2023).

DISCUSSION

This study provides empirical evidence that the competitiveness of Mexican family-owned High-Frequency Stores (HFS) depends on a dynamic interaction between family embeddedness, digital literacy, and technological adoption, by demonstrating that competitiveness emerges from the interaction between long-established family resources and gradually developed technological capabilities. Rather than replacing traditional organizational structures, technological adoption appears to complement the relational advantages that characterize this retail format. These findings support the premise of Family Embeddedness Theory that entrepreneurial behavior is deeply influenced by family relationships, trust, and informal governance (Aldrich & Cliff, 2003), while extending the Resource-Based View by identifying digital literacy and technological adoption as complementary strategic resources that can strengthen organizational performance.

The structural model confirms that Technological Adoption positively influences Business Performance (H1), suggesting that even relatively simple technologies—such as electronic payment systems, point-of-sale platforms, digital communication channels, and social media—can improve operational effectiveness and competitiveness. This finding is consistent with previous studies reporting positive performance effects associated with digital technologies in small and micro-enterprises (Affandi et al., 2024; Kusumawardhani et al., 2023). However, the present study further shows that technology should not be interpreted as a replacement for the traditional family business model. Instead, technological resources become valuable when they reinforce existing relational capabilities built upon trust, proximity, and long-term customer relationships.

The results also indicate that Digital Literacy has a significant direct effect on Business Performance (H2). This finding suggests that owners' digital competencies constitute a strategic capability that extends beyond the simple use of technological tools. Owners with stronger digital skills appear better equipped to evaluate information, make informed managerial decisions, communicate with customers, and identify opportunities for improving business processes. These findings reinforce previous arguments that managerial digital literacy represents a critical micro-foundation of digital transformation in small firms (Noviaristanti & Boon, 2022; Zahoor et al., 2023).

Contrary to expectations, the mediating role of Technological Adoption was not supported (H3). Although Digital Literacy strongly contributes to technological adoption, the indirect pathway from Digital Literacy to Business Performance through Technological Adoption was not statistically significant.

This result suggests that digital competencies generate organizational value through mechanisms that extend beyond the implementation of digital technologies alone. Managerial judgment, organizational learning, entrepreneurial orientation, customer relationship management, and operational flexibility may represent complementary capabilities through which digitally literate owners improve firm performance. Consequently, technological adoption should be understood as one component of a broader capability-building process rather than as the sole mechanism through which digital literacy creates competitive advantage.

From a theoretical perspective, these findings contribute to the family business literature by proposing that High-Frequency Stores operate as hybrid organizations in which traditional family resources and emerging technological capabilities coexist. Family embeddedness continues to provide organizational stability, social legitimacy, and resilience, while digital literacy and technological adoption enhance adaptability and long-term competitiveness (Szewczyk et al., 2022). Rather than depicting tradition and digitalization as opposing forces,

the results suggest that successful digital transformation in family-owned microenterprises occurs when technological capabilities are integrated into pre-existing social structures instead of replacing them.

Additionally, it shows that digital transformation within High-Frequency Stores is better understood as a gradual socio-organizational process than as a purely technological transition. Family embeddedness remains the primary source of organizational stability and resilience, whereas digital literacy and technological adoption function as complementary strategic capabilities that strengthen long-term competitiveness without replacing the relational foundations of these businesses (Aldrich & Cliff, 2003; Issah & Calabrò, 2024).

The study also contributes to the growing literature on digital transformation in emerging economies. Much of the existing research has focused on either technological or family business dynamics independently (Tirdasari et al., 2024). By integrating Family Embeddedness Theory with the Resource-Based View, this research demonstrates that digital transformation within informal retail should be interpreted as a socio-organizational process in which technological capabilities interact with family relationships, community trust, and organizational culture. This integrated perspective offers a more comprehensive explanation of why some High-Frequency Stores achieve superior performance despite significant resource constraints.

Overall, the findings indicate that the future competitiveness of High-Frequency Stores will depend less on abandoning their traditional family-based business model than on their ability to progressively integrate digital capabilities into their existing organizational routines. In this sense, digital transformation represents an evolutionary rather than a disruptive process, preserving the relational strengths that distinguish family-owned retail businesses while enabling them to compete more effectively in increasingly digital marketplaces.

CONCLUSION

This study adds to the literature by showing that the competitiveness of Mexican family-owned High-Frequency Stores (HFS) depends on a dynamic interaction among family embeddedness, digital literacy, and technological adoption. Technological adoption positively influences business performance. Digital Literacy has a significant direct effect on Business Performance, but the mediating role of Technological Adoption was not demonstrated.

Practical implications: For practitioners, the evidence highlights the need to integrate family business training with digital literacy programs, enabling owners to convert social trust and

relational capital into sustainable competitive advantage. Training initiatives should not treat digital skills as purely technical competencies, but as strategic capabilities that strengthen existing family-based resources such as customer loyalty, community reputation, and informal governance. In this way, digital literacy becomes a mechanism for amplifying, rather than replacing, the social capital that characterizes High-Frequency Stores.

Policymakers should view High-Frequency Stores as hybrid socio-economic units in which economic activity and family livelihoods are deeply interconnected. This implies that public policies must go beyond conventional SME support and promote integrated initiatives that combine microcredit, mentorship, and community-based digital hubs. Such programs should address financial constraints, managerial capacity building, and cultural resistance to change, recognizing that digital transformation in family businesses is a gradual, negotiated process rather than an instantaneous technological upgrade.

Higher digital adoption is linked to stronger business performance; therefore, enhancing digital and managerial skills within cohesive family structures can significantly strengthen competitiveness, operational efficiency, and resilience. Digital literacy acts as a performance multiplier, allowing family firms to better leverage their relational advantages, improve customer engagement, optimize processes, and expand market reach without undermining their traditional identity. Importantly, although this study is grounded in the Mexican context, the findings may provide useful insights for similar contexts in other emerging economies.

Limitations and future research

This study presents several limitations that should be considered when interpreting its findings. First, the research employed a non-probability convenience and snowball sampling strategy focused exclusively on family-owned High-Frequency Stores located in the Guadalajara Metropolitan Area (GMA), Mexico. Because no official census or complete sampling frame exists for this type of microenterprise, probability sampling was not feasible; the findings should be interpreted as evidence describing the relationships observed among the participating businesses within the specific socio-economic context of the Guadalajara Metropolitan Area.

Second, although the final sample size was adequate for Structural Equation Modeling (SEM), the study's geographical coverage remains limited. The findings should not be extrapolated to other Mexican regions, where economic conditions, levels of digital infrastructure, cultural characteristics, family business dynamics, and technological ecosystems may differ substantially. Regional heterogeneity across Mexico suggests that the determinants of technological adoption and business performance may vary considerably between metropolitan, semi-urban, and rural environments.

Third, the cross-sectional design prevents definitive causal inference and captures organizational conditions at only one point in time. Although the structural model identifies statistically significant relationships among family embeddedness, digital literacy, technological adoption, and business performance, these relationships may evolve as firms continue their digital transformation. Longitudinal research would provide a more comprehensive understanding of how technological capabilities develop and influence organizational performance over time.

Fourth, all variables were measured through self-reported perceptions provided by store owners or managers. Although procedural remedies (anonymity, confidentiality, voluntary participation) and statistical diagnostics were implemented to mitigate common method bias, self-reported data remain susceptible to response biases, including social desirability, recall bias, and subjective assessments of business performance and digital capabilities. Consequently, some degree of residual measurement bias cannot be completely ruled out.

Fifth, the study relied primarily on perceptual and organizational indicators and did not incorporate audited financial statements, transactional records, operational productivity measures, or longitudinal business outcomes. Accordingly, business performance should be interpreted as perceived organizational performance rather than as objectively verified financial performance.

Finally, the conceptual model was tested exclusively within family-owned High-Frequency Stores operating in the traditional retail sector. These businesses possess distinctive socio-cultural, organizational, and governance characteristics that differentiate them from larger retail chains, non-family firms, franchised businesses, and highly formalized commercial organizations. Therefore, the theoretical relationships identified in this study should not be assumed to operate similarly across other organizational contexts without further empirical verification.

Directions for future research: Despite these limitations, this study provides robust empirical evidence regarding the relationships among family embeddedness, digital literacy, technological adoption, and business performance within an under-researched segment of the Mexican retail sector.

It also establishes a solid foundation for future studies employing probability sampling, broader geographical coverage, longitudinal research designs, objective performance indicators, and cross-country comparisons to evaluate the extent to which the proposed conceptual model is transferable for further research beyond the Guadalajara Metropolitan Area.

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APPENDIX A

Technical Sheet of the Survey

Population	The population consisted of collaborators from HFS stores, including owners, family members, and employees involved in administrative activities, customer service, and store management operations.
Objective of the Study	The objective of the survey was to collect empirical data from collaborators of HFS stores in order to analyze the adoption, perceptions, operational use, and challenges associated with Generative Artificial Intelligence (GenAI) within retail and family-business environments.
Sampling Method	Non-probabilistic convenience sampling.
Period of Data Collection	Data was collected from March to June, 2025.
Data Collection Technique	Online survey administered through Google Forms.
Sample Size	126 respondents
Confidence Level	95%
Margin of Error	± 5%
Survey Conducted by	Mauro Rodríguez Marín & Miguel Angel Lopez-Lomeli
Source	Prepared by the authors based on survey data.

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Capital Structure under Systemic Shocks: How COVID-19 Reshaped SME Financing

Estructura de capital ante shocks sistémicos: cómo la COVID-19 reconfiguró la financiación de la PYME

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ABSTRACT

This study examines how the COVID-19 crisis reshaped the determinants of capital structure among Portuguese industrial small and medium-sized enterprises (SMEs). Using firm-level and macroeconomic data from 7,006 SMEs over 2016–2023, we estimated a fixed-effects panel model with robust standard errors. Before the pandemic, profitability, liquidity, and maturity were negatively associated with leverage, whereas size and asset tangibility increased debt financing, broadly supporting Pecking Order Theory. The findings show that the pandemic reshaped the determinants of SME financing rather than aggregate debt levels, revealing an adaptive response to systemic uncertainty. The study extends capital structure research in bank-based economies and provides implications for financial and regulatory policies supporting SMEs during systemic crises.

Keywords: Capital structure; SME financing; Financial constraints; Pecking Order Theory; Systemic shocks

JEL Code: G32, L25

RESUMEN

Este estudio analiza cómo la crisis de la COVID-19 reconfiguró los determinantes de la estructura de capital de las pequeñas y medianas empresas (pymes) industriales portuguesas. A partir de datos a nivel de empresa y macroeconómicos de 7.006 pymes correspondientes al periodo 2016-2023, se estimó un modelo de datos de panel de efectos fijos con errores estándar robustos. Antes de la pandemia, la rentabilidad, la liquidez y el vencimiento de la deuda presentaban una relación negativa con el apalancamiento, mientras que el tamaño y la tangibilidad de los activos favorecían la financiación mediante deuda, lo que respaldaba, en líneas generales, la teoría de la jerarquía financiera (*Pecking Order Theory*). Los resultados indican que la pandemia transformó los determinantes de la financiación de las pymes más que los niveles agregados de deuda, lo que evidencia una respuesta adaptativa ante la incertidumbre sistémica. El estudio amplía la investigación sobre la estructura de capital en economías basadas en la financiación bancaria y ofrece implicaciones para las políticas financieras y regulatorias de apoyo a las pymes durante crisis sistémicas.

Palabras clave: Estructura de capital; Financiación de la PYME; Restricciones financieras; Teoría de la jerarquía financiera; Choques sistémicos

Código JEL: G32, L25.

INTRODUCTION

Capital structure is a central theme in corporate finance, influencing a company's financial performance, risk profile, and long-term sustainability (Esposito et al., 2026; Jain et al., 2024; Modigliani & Miller, 1958; Nguyen, 2023). It reflects the mix of equity and debt used to finance business activities and shapes decisions related to investment, growth, and financial stability (Fedorova et al., 2024; Myers & Majluf, 1984; Vo et al., 2022). While debt-free firms may be financially sound, they may also underutilize growth opportunities. Conversely, excessive leverage increases the risk of distress and potential bankruptcy (Anh et al., 2023; Kraus & Litzenberger, 1973), making the search for an optimal capital structure an enduring issue in financial research. The literature has extensively studied several determinants, notably profitability, size, asset tangibility, liquidity, and firm age. However, findings remain inconsistent across studies, suggesting context-specific dynamics related to industry, geography, and macroeconomic conditions (Lisboa, 2019; Neves et al., 2020).

Among these contextual factors, the economic cycle plays a key role in influencing firms' access to capital and debt strategies (Duguleană et al., 2024). In boom periods, credit access and risk appetite tend to increase, whereas recessions restrict financing and raise borrowing costs (Jordà et al., 2011). Recent global disruptions, especially the COVID-19 pandemic, further amplified these dynamics. The pandemic created unprecedented economic uncertainty, disrupted operations, weakened cash flows, and intensified financial vulnerability, particularly among SMEs (Yang, 2022). Given their limited capacity to absorb shocks, SMEs in countries like Portugal were disproportionately affected, raising concerns over their financial resilience (Palminha et al., 2027; Matias & Serrasqueiro, 2017; Mota & Moreira, 2017).

This study investigates how the COVID-19 pandemic reshaped the determinants of capital structure in Portuguese industrial SMEs. Focusing on sectors under CAE codes 10 to 32, the analysis compares the pre-pandemic (2016–2019), COVID-19, and post-COVID (2020–2023) periods. In contrast to earlier studies, this research incorporates macroeconomic indicators –such as inflation, interest rates, and local unemployment growth– into the analysis, offering a broader understanding of external influences. Portugal is a good institutional setting for this research. The country has evidenced a strong recovery after the European sovereign-debt crisis, and the industrial landscape is heavily populated by SMEs. Additionally, Portugal is a bank-based economy, meaning that the findings may provide relevant insights for comparable bank-based Southern European economies.

By bridging firm-level and macro-level perspectives, the study aims to contribute new insights into how crises affect capital structure decisions in SMEs. Specifically, it seeks to answer the following questions:

i) What are the key determinants of capital structure among Portuguese industrial SMEs?

ii) How did the COVID-19 pandemic alter the influence of these determinants?

This study contributes to capital structure literature in three main ways. First, theoretically, it extends the Pecking Order and Trade-Off frameworks by showing how systemic crises can alter the relative importance of firm-specific and macroeconomic determinants of SME financing decisions in a bank-based economy. Second, empirically, the study provides evidence from a balanced panel of 7,006 Portuguese industrial SMEs between 2016 and 2023, distinguishing between pre- and COVID-19 and post-COVID periods and between short- and long-term debt structures. The findings demonstrate that the COVID-19 crisis affected financing behavior and debt maturity choices more than overall leverage levels, while also increasing the relevance of macroeconomic conditions such as inflation, interest rates, and unemployment. Third, in terms of policy and managerial relevance, the results highlight the importance of financial flexibility, debt maturity management, and targeted public support mechanisms in strengthening SME resilience during periods of economic uncertainty.

The article proceeds as follows: Section 2 presents a literature review covering capital structure theories, the pandemic's economic effects, and key determinants. Section 3 describes the data, variables, and econometric model. Section 4 reports and discusses the results, and Section 5 concludes with implications, limitations, and suggestions for future research.

LITERATURE REVIEW

Capital structure theories

Modigliani and Miller (1958) established the foundational theory of capital structure, arguing that under perfect market conditions –without taxes, transaction costs, or asymmetries – capital structure has no impact on firm value. However, this framework was soon revised (Modigliani & Miller, 1963) to incorporate the tax shield benefit of debt, suggesting that leveraged firms enjoy a lower effective cost of capital. Miller (1977) further refined the view, noting that personal and corporate taxation could offset these benefits.

Myers (1977) introduced financial flexibility as a key consideration, explaining why firms do not maximize debt usage despite tax advantages. Firms with high investment potential may avoid excessive leverage to retain agility. The Trade-Off Theory (Kraus & Litzenberger, 1973) balances tax advantages against bankruptcy risks. In contrast, the Pecking Order

Theory (Myers & Majluf, 1984) emphasizes information asymmetry: firms prefer internal funding, resort to debt if necessary, and avoid equity to prevent negative market signaling.

Jensen and Meckling (1976) introduced agency theory to explain how conflicts between managers, shareholders, and creditors create costs that influence capital structure. High debt levels may incentivize risk-taking by shareholders, while also constraining managerial discretion. Jensen (1986) later argued that debt can act as a disciplining mechanism, promoting more efficient resource use. Although no theory fully explains capital structure choices, these perspectives underscore the relevance of internal firm dynamics (Jain et al., 2024).

The impact of COVID-19 on capital structure

Macroeconomic shocks like the COVID-19 pandemic substantially alter firm financing behavior. Crises elevate default risk and constrain credit supply, reinforcing conservative financial strategies. During such periods, firms tend to align with the Pecking Order Theory, prioritizing internal financing and liquidity preservation (Alhajjeah & Besim, 2024; Gao & Tsusaka, 2023).

Unlike the 2008 financial crisis, COVID-19 originated outside financial markets, yet its impact on capital structure was significant and multifaceted. Revenue losses and heightened uncertainty led many firms, especially SMEs, to reduce leverage or shift toward short-term debt (Deviyanti et al., 2023; Fedorova et al., 2024; Palminha et al., 2027). Some adopted proactive refinancing strategies, converting short-term liabilities into longer-term obligations to preserve liquidity (Shukla et al., 2024; Ahmed et al., 2024).

Responses varied by firm characteristics. Larger firms tended to deleverage more aggressively, while asset tangibility influenced long-term borrowing more than short-term (Jain et al., 2024; Vo et al., 2022). Over time, many firms revised earlier responses as markets stabilized, highlighting the need to examine both immediate and long-term effects of such crises.

For the purpose of this analysis, the study period is segmented into two distinct time intervals: the pre-pandemic period (2016–2019) and the post-pandemic period (2020–2023). The year 2020 is considered a turning point, as the first signs of an emerging global pandemic appeared in the early weeks of that year, culminating in the World Health Organization's official declaration of a pandemic on March 11, 2020.

Based on these findings from the literature, the following research hypothesis is formulated: *H1: The effect of the determinants on leverage levels changed in the COVID-19 and post-COVID period compared to the pre-pandemic period.*

Firm-specific determinants

Empirical research has identified several internal firm characteristics as key determinants of capital structure. Among these, profitability, size, asset tangibility, liquidity, and firm age are frequently studied.

Profitability

Most studies, especially on Portuguese SMEs, support a negative relationship between profitability and leverage, consistent with the Pecking Order Theory. Profitable firms prefer to use retained earnings rather than incur debt, thus preserving control and minimizing financial risk (Boumlik et al., 2025; Matias & Serrasqueiro, 2017; Nassim et al., 2025; Neves et al., 2020; Oliveira et al., 2026). However, some evidence shows profitability may be statistically insignificant under certain conditions (Lisboa, 2019; Neves et al., 2024), suggesting that context matters. Given the predominance of empirical evidence supporting the Pecking Order theory, the following hypothesis is proposed:

H2: Profitability is negatively related to the level of indebtedness.

Firm Size

Larger firms generally enjoy better credit access, lower information asymmetries, and higher credibility, encouraging greater use of debt—particularly long-term (Neves et al., 2020). This is consistent with both the Trade-Off and Pecking Order theories. However, some studies show a negative or insignificant relationship, especially for short-term debt (Lisboa, 2019), suggesting that larger firms may rely more on internal cash flows or face sector-specific dynamics.

In the empirical part of this study, in addition to considering total debt as the dependent variable, the hypothesis that the determinants may have different effects on short- and long-term debt will also be tested. Since the positive relationship is more prevalent among Portuguese SMEs, the following hypothesis is proposed:

H3: Firm size is positively related to the level of indebtedness.

Tangible assets serve as collateral, reducing creditor risk and enhancing debt capacity. Empirical evidence often shows a positive association between tangibility and long-term debt (Matias & Serrasqueiro, 2017; Neves et al., 2024), though some studies report a negative or insignificant effect, particularly for short-term debt (Singh et al., 2025). This may reflect creditor reluctance to accept fixed assets as short-term security (Psillaki & Daskalakis, 2009). The predominance of empirical evidence supporting the Trade-Off and Pecking Order theories leads to the formulation of the following hypothesis:

H4: Asset tangibility is positively related to the level of indebtedness.

Liquidity

Firms with high liquidity are less dependent on external financing, aligning with the Pecking Order Theory. While some research shows a clear negative correlation (Lisboa, 2017a), other studies – particularly those using Portuguese data – find mixed or insignificant results (Pacheco & Tavares, 2017). Notably, firms may maintain liquidity buffers while still using long-term debt for strategic investments (Lisboa, 2019). Thus, the following hypothesis is proposed:

H5: A company's liquidity is negatively related to the level of indebtedness.

Age

Older firms generally exhibit stronger reputations, internal reserves, and creditworthiness, which may reduce their reliance on debt. Several studies show that older firms assume more debt (e.g., Hovakimian et al., 2001; Sundaresan et al., 2015). For instance, Kieschnick and Moussawi (2018) find that the effects of firm age on how much debt a firm uses are primarily due to the interaction between firm age and its governance characteristics. However, empirical studies on Portuguese SMEs consistently show a negative relationship between firm age and total or short-term debt (Matias & Serrasqueiro, 2017; Serrasqueiro & Nunes, 2012), supporting conservative financial behavior as firms mature. Thus, the following hypothesis is proposed:

H6: A company's age is negatively related to the level of indebtedness.

Macroeconomic determinants

While firm-specific factors dominate most models, macroeconomic conditions significantly influence the availability and cost of financing. Variables such as inflation, interest rates, and unemployment shape firm behavior, especially during crises.

Inflation

The theoretical relationship between inflation and debt is ambiguous. On one hand, inflation may encourage borrowing by reducing the real cost of debt (Trade-Off Theory); on the other, it can signal instability and lead to deleveraging. Empirical findings are mixed: while some support a positive link (Frank & Goyal, 2009), others report negative or insignificant effects (Jõeveer, 2013; Neves et al., 2020). For Portuguese SMEs, inflation has generally been found to discourage long-term debt, possibly due to risk aversion and market volatility. Still, formulating the hypothesis in line with the Trade-Off and Pecking Order theories, we propose:

H7: Inflation is positively related to the level of indebtedness.

Interest Rates

Higher interest rates increase the cost of borrowing and tend to reduce leverage, aligning with the Trade-Off Theory. Studies show a negative correlation between interest rates and debt

levels (Hatzinikolaou et al., 2002; Ramli et al., 2019). However, the relationship may vary with credit availability and economic outlook. For example, some firms may still take on debt in high-rate environments if future growth expectations are strong (Savvakis et al., 2021). Following the prediction of the Trade-Off theory, the following hypothesis is formulated:
H8: Interest rates are negatively related to the level of indebtedness.

Unemployment
Though less commonly studied, unemployment influences corporate risk assessments and investment strategies. Rising unemployment can signal economic deterioration, reducing firms' willingness to borrow. Some studies suggest a negative correlation between unemployment and leverage (Vega-Gutierrez et al., 2021), while others find no clear pattern. Importantly, this study uses municipal-level unemployment data to capture regional differences, providing a more granular understanding of localized credit conditions. Based on the evidence presented, the following research hypothesis is formulated:
H9: Unemployment is negatively related to the level of indebtedness.

All these hypotheses will also be studied in terms of whether the COVID-19 pandemic strengthened or weakened the influence of the different variables on leverage.

METHODOLOGY

Variables, data and sample
This study investigates how the determinants of capital structure in Portuguese industrial SMEs evolved during the COVID-19 period. The dependent variable is total indebtedness, calculated as the ratio of total liabilities to total assets (here referred to as TD). To distinguish debt profiles, long-term debt (non-current liabilities to total assets) and short-term debt (current liabilities to total assets) are also analyzed, defined as LTD and STD, respectively.

Independent variables fall into two categories: firm-specific determinants (profitability, size, tangibility, liquidity, and age) and macroeconomic indicators (inflation, interest rates, and municipal unemployment growth). These variables correspond to hypotheses derived from prior literature and are summarized in Table 1.

Table 1
Independent Variables

Hipothesis	Acronym	Independent variable	Formula	Expected sign
H2	PRO	Profitability	$\frac{\text{EBIT}}{\text{Total Asssets}}$	–
H3	SIZ	Size	Ln (Total Assets)	+
H4	TANG	Tangibility	$\frac{\text{Tangible Fixed Assets}}{\text{Total Assets}}$	+
H5	LIQ	Liquidity	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	–
H6	AGE	Age	Ln (Year – Year of Foundation)	–
H7	INF	Inflation	Inflation rate	+
H8	IR	Interest rates	Interest rate for new loan operations	–
H9	UNE	Growth in the municipality registered unemployment	$\frac{\Delta \text{ Registered unemployment in the Municipality}}{\text{Registered unemployment in the Municipality}}$	–

Source: Own elaboration.

Table 2
Distribution of firms by CAE

CAE	DESCRIPTION	N	%
10	Food	712	10.2%
11	Beverages	161	2.3%
12	Tobacco	0	0.0%
13	Textiles	461	6.6%
14	Wearing apparel	808	11.5%
15	Leather and related products	415	5.9%
16	Wood and products of wood and cork	381	5.4%
17	Paper and paper products	123	1.8%
18	Printing and reproduction of recorded media	213	3.0%
19	Refined petroleum	5	0.1%
20	Chemicals and man-made fibers	151	2.2%
21	Pharmaceutical products	26	0.4%
22	Rubber and plastic products	350	5.0%
23	Other non-metallic mineral products	510	7.3%
24	Basic metals	65	0.9%
25	Fabricated metal products	1328	19.0%
26	Computer, communication and electronic equip.	45	0.6%
27	Electrical equipment	122	1.7%
28	Machinery and equipment	357	5.1%
29	Motor vehicles, trailers and parts	108	1.5%
30	Other transport equipment	33	0.5%
31	Furniture	470	6.7%
32	Other manufacturing activities	162	2.3%
	Total	7,006	100%

Source: Own elaboration.

The analysis covers 2016–2023. The final sample includes 7,006 active SMEs in mainland Portugal, operating in industrial sectors under CAE codes 10 to 32. Table 2 presents the distribution of firms by CAE. Firms were selected from the ORBIS database and met the

EU's SME criteria. We retained only firms with consistently positive values for key financial indicators across the period, resulting in a balanced panel of 56,048 observations. Macroeconomic variables were sourced from PORDATA and the Bank of Portugal, matched to firms by their municipality.

To assess the relationship between capital structure and its determinants, panel data models were estimated for total, long-term, and short-term debt. The models include both firm-level and macroeconomic variables and were estimated using a Fixed Effects Model (FEM) based on F, Breusch-Pagan, and Hausman tests. Robust standard errors (HAC) were used due to evidence of heteroscedasticity and autocorrelation. Accordingly, three regressions were estimated, one for each dependent variable. These variables include total debt ($TD_{i,t}$), long-term debt ($LTD_{i,t}$) and short-term debt ($STD_{i,t}$), with the following base specification:

$$TD_{i,t} = \beta_1 + \beta_2 PRO_{i,t} + \beta_3 SIZ_{i,t} + \beta_4 TANG_{i,t} + \beta_5 LIQ_{i,t} + \beta_6 AGE_{i,t} + \beta_7 INF_{i,t} + \beta_8 IR_{i,t} + \beta_9 UNE_{i,t} + \varepsilon_{i,t} \quad (1)$$

where independent variables are profitability ($PRO_{i,t}$), size ($SIZ_{i,t}$), tangibility ($TANG_{i,t}$), liquidity ($LIQ_{i,t}$), age ($AGE_{i,t}$), inflation ($INF_{i,t}$), interest rate ($IR_{i,t}$), and the growth in the municipality's unemployment ($UNE_{i,t}$). i represents individual firms, t is the year in the analysis, β corresponds to the estimated coefficients, and $\varepsilon_{i,t}$ is the idiosyncratic error, which changes between firms and during the period.

Separate regressions were conducted for pre-pandemic (2016–2019) and COVID-19 and post-COVID (2020–2023) periods to compare structural changes. A dummy variable was introduced in the full-period model to isolate the COVID-19 context. Additional diagnostics included Pearson correlation matrices, variance inflation factors (VIFs), the Modified Wald test, and the Wooldridge test to ensure statistical validity. All analyses were performed using STATA 18.5.

RESULTS

Descriptive statistics

Table 3 presents summary statistics for the dependent and independent variables across the full sample and the pre- and COVID-19 and post-COVID subperiods. On average, total debt across firms was 53.76%, with a decrease from 55.12% pre-pandemic to 52.40% COVID-19 and post-COVID. While long-term debt slightly increased (17.02% to 17.86%), short-term debt declined more notably (38.10% to 34.54%), suggesting a shift toward longer-term financing.

Table 3
Descriptive Statistics

Variable	Period	Average	s.d.	Minimum	Maximum
	Pre-Pandemic	0.55120	0.21754	0.01014	0.99971
TD	COVID-19 and post-COVID	0.52400	0.22168	0.00598	0.99994
	Total	0.53760	0.22004	0.00598	0.99994
	Pre-Pandemic	0.17019	0.16913	0.00000	0.99493
LTD	COVID-19 and post-COVID	0.17860	0.16733	0.00000	0.91414
	Total	0.17439	0.16828	0.00000	0.99493
	Pre-Pandemic	0.38102	0.19266	0.00050	0.99971
STD	COVID-19 and post-COVID	0.34540	0.17872	0.00020	0.99668
	Total	0.36321	0.18667	0.00020	0.99971
	Pre-Pandemic	0.06620	0.09521	-6.02505	1.18606
PRO	COVID-19 and post-COVID	0.05793	0.09126	-0.99151	0.83671
	Total	0.06206	0.09335	-6.02505	1.18606
	Pre-Pandemic	7.37636	1.31191	0.95618	11.90141
SIZ	COVID-19 and post-COVID	7.68060	1.28104	3.56370	11.46195
	Total	7.52848	1.30544	0.95618	11.90141
	Pre-Pandemic	0.30520	0.20077	0.00000	0.99737
TANG	COVID-19 and post-COVID	0.30163	0.19511	0.00000	0.99360
	Total	0.30342	0.19797	0.00000	0.99737
	Pre-Pandemic	2.51781	6.05431	0.01121	733.0018
LIQ	COVID-19 and post-COVID	2.74262	3.52458	0.05330	286.8400
	Total	2.63022	4.95488	0.01121	733.0018
	Pre-Pandemic	2.92750	0.77951	0.00000	5.71703
AGE	COVID-19 and post-COVID	3.17110	0.58485	1.60944	5.73010
	Total	3.04930	0.69976	0.00000	5.73010
	Pre-Pandemic	0.00825	0.00415	0.00300	0.01400
INF	COVID-19 and post-COVID	0.03350	0.03005	0.00000	0.07800
	Total	0.02088	0.02489	0.00000	0.07800
	Pre-Pandemic	0.02634	0.00352	0.02236	0.03159
IR	COVID-19 and post-COVID	0.02978	0.01386	0.01977	0.05338
	Total	0.02806	0.01025	0.01977	0.05338
	Pre-Pandemic	-0.14140	0.06974	-0.36175	0.34159
UNE	COVID-19 and post-COVID	0.01456	0.18207	-0.46572	1.48695
	Total	-0.06342	0.15839	-0.46572	1.48695

Notes: Variables are total debt (TD), long-term debt (LTD), short-term debt (STD), profitability (PRO), size (SIZ), tangibility (TANG), liquidity (LIQ), age (AGE), inflation (INF), interest rate (IR), and the growth in the municipality's unemployment (UNE). Pre-Pandemic and COVID-19 and post-COVID periods correspond, respectively, to 2016-2019 and 2020-2023.
Source: Own Elaboration.

Firms averaged 21 years of age. Profitability dropped from 6.62% to 5.79%, while liquidity slightly declined. Asset tangibility and size remained relatively stable. Macroeconomic indicators varied considerably: inflation nearly tripled in the COVID-19 and post-COVID period, and municipal unemployment growth more than doubled, reflecting broader economic disruption.

Table 4 presents the correlation matrix for the total sample. The correlation coefficients between the variables are generally low. The strongest associations appear between INF and COV_dum (r = 0.5072) and between UNE and COV_dum (r = 0.4923); both remain below the threshold of concern.

Table 4
Person correlation matrix

	PRO	SIZ	TANG	LIQ	AGE	INF	IR	UNE	COV_dum
PRO	1.0000								
SIZ	0.0381 (***)	1.0000							
TANG	-0.1503 (***)	0.1152 (***)	1.0000						
LIQ	0.0497 (***)	0.0039	-0.1418 (***)	1.0000					
AGE	0.0841 (***)	0.3392 (***)	0.0320 (***)	0.0543 (***)	1.0000				
INF	0.0246 (***)	0.0867 (***)	0.0116 (***)	0.0058	0.1208 (***)	1.0000			
IR	0.0301 (***)	0.0346 (***)	0.0028	0.0055	0.0540 (***)	0.3801 (***)	1.0000		
UNE	-0.0707 (***)	0.0454 (***)	0.0093 (**)	0.0166 (***)	0.0660 (***)	-0.2554 (***)	0.0617 (***)	1.0000	
COV_dum	-0.0443 (***)	0.1165 (***)	-0.0090 (**)	0.0227 (***)	0.1741 (***)	0.5072 (***)	0.1680 (***)	0.4923 (***)	1.0000

Notes: ***p < 0.01; **p < 0.05; *p < 0.1 Variables are total debt (TD), long-term debt (LTD), short-term debt (STD), profitability (PRO), size (SIZ), tangibility (TANG), liquidity (LIQ), age (AGE), inflation (INF), interest rate (IR), and the growth in the municipality's unemployment (UNE). Pre-Pandemic and Post-Covid periods correspond, respectively, to 2016-2019 and 2020-2023
Source: Own elaboration.

Although those values are not presented, comparing the correlation matrices between the independent variables for the pre-Pandemic, COVID-19, and post-COVID subperiods reveals relevant changes in the correlations. There is a strengthening in the COVID-19 and post-COVID period of the negative association between INF and UNE (r = -0.6992), as well as an increase in the correlation between IR and INF (r = 0.3551), which may reflect an intensification of the relationship between financial conditions and overall economic sentiment during this period.

To assess possible signs of multicollinearity, the VIF results indicate that, in all periods considered – pre-Pandemic, COVID-19 and post-COVID, and the total period – the values remain well within the limits normally accepted in the literature (i.e., below 5), showing no evidence of collinearity among the independent variables (Gujarati, 2003; Shrestha, 2020). The average VIF values also remain low across the three periods, ranging between 1.23 and 1.75.

Econometric results and discussion

Consistently, the Breusch-Pagan, F, and Hausman tests supported the choice of the fixed effects model (FEM) as the most appropriate for all specifications. Similar procedures were applied to the long-term and short-term debt variables, with the respective tests corroborating the same pattern of results, reinforcing the robustness of choosing the FEM for all dimensions of indebtedness analyzed. The model was estimated with clustered robust standard errors (HAC). This choice was due to detected heteroscedasticity and autocorrelation in the error components, as evidenced by the Modified Wald and Wooldridge tests.

Table 5 presents the estimated coefficients, along with their respective levels of statistical significance and robust standard deviations. Below we contextualize the findings across three dimensions: firm-specific determinants, macroeconomic factors, and the impact of the COVID-19 pandemic.

Firm-Specific Determinants

Consistent with the Pecking Order Theory and prior research on Portuguese SMEs (Matias & Serrasqueiro, 2017), profitability showed a consistent negative effect on all forms of debt. More profitable firms rely on internal resources, minimizing financial risk. Supporting the Pecking Order Theory, these results also support hypothesis H2.

Firm size was positively associated with leverage, particularly long-term debt, supporting the Trade-Off Theory. Larger firms benefit from greater access to credit markets and economies of scale in borrowing (Lisboa, 2017b; Pacheco, 2016; Pacheco & Carvalho, 2026), providing empirical support for H3. However, the coefficient is smaller in the COVID-19 and post-COVID period, possibly reflecting heightened credit selectivity and risk aversion.

Asset tangibility influenced capital structure as expected: positively related to long-term debt (due to collateral value) and negatively associated with short-term debt. These findings reinforce the view that tangible assets provide borrowing capacity in long-term arrangements but may be ill-suited for short-term collateralization. This result on tangibility aligns with existing literature, particularly studies by Lisboa (2019), Matias & Serrasqueiro (2017), and Neves et al. (2020), and supports hypothesis H4.

The relationship between liquidity and capital structure is ambiguous, so H5 is not fully supported. While no significant link was found between liquidity and total debt – echoing prior studies (Lisboa, 2019; Pacheco & Tavares, 2017) – maturity-level analysis reveals clearer patterns. Firms with greater liquidity tend to reduce short-term borrowing, consistent with conservative cash management, yet exhibit higher long-term debt. This suggests a strategic use of liquidity: avoiding short-term constraints while leveraging strong financial

positions to secure favorable long-term financing. These findings reflect both the Pecking Order theory (internal financing preference) and the Trade-Off theory (balancing debt benefits and costs).

Firm age was negatively associated with all debt lengths, supporting the idea that older firms favor more stable, conservative financial structures and confirming H6. Their longer credit histories and internal funds reduce dependency on short-term borrowing (Serrasqueiro & Nunes, 2012).

Table 5
Fixed Effects Model with robust standard errors

		TD	STD	LTD
Variables	**Period**	Coefficient (s.d.)	Coefficient (s.d.)	Coefficient (s.d.)
Constant	Pre-Pandemic	0.08182 * (0.04562)	-0.27947 *** (0.04626)	0.36129 *** (0.05388)
	COVID-19 and post-COVID	0.30893 *** (0.05780)	-0.03647 (0.05885)	0.34540 *** (0.06424)
	Total	0.62723 *** (0.02908)	0.01073 (0.02522)	0.61650 *** (0.03096)
PRO	Pre-Pandemic	-0.27332 *** (0.05416)	-0.13137 *** (0.02877)	-0.14196 *** (0.02842)
	COVID-19 and post-COVID	-0.29434 *** (0.01098)	-0.16703 *** (0.01030)	-0.12731 (0.01100)
	Total	-0.30598 *** (0.03487)	-0.16506 *** (0.01754)	-0.14092 *** (0.01976)
SIZ	Pre-Pandemic	0.09312 *** (0.00552)	0.05957 *** (0.00564)	0.03355 *** (0.00635)
	COVID-19 and post-COVID	0.08757 *** (0.00608)	0.06671 *** (0.00506)	0.02086 *** (0.00594)
	Total	0.03999 *** (0.00396)	0.04285 *** (0.00355)	-0.00286 (0.00417)
TANG	Pre-Pandemic	0.06527 *** (0.01307)	0.24889 *** (0.01540)	-0.18362 *** (0.01590)
	COVID-19 and post-COVID	0.02318 * (0.01325)	0.19740 *** (0.01522)	-0.17422 *** (0.01912)
	Total	0.07425 *** (0.01191)	0.22199 *** (0.01085)	-0.14774 *** (0.01357)
LIQ	Pre-Pandemic	-0.00096 (0.00079)	0.00197 * (0.00105)	-0.00294 (0.00183)
	COVID-19 and post-COVID	-0.00529 ** (0.00225)	0.00450 * (0.00240)	-0.00979 ** (0.00464)
	Total	-0.00262 (0.00160)	0.00238 ** (0.00119)	-0.00500 * (0.00278)
AGE	Pre-Pandemic	-0.11151 *** (0.00820)	-0.04245 *** (0.00958)	-0.06905 *** (0.01062)
	COVID-19 and post-COVID	-0.12806 *** (0.01581)	-0.10147 *** (0.01667)	-0.02659 (0.01812)
	Total	-0.12294 *** (0.00659)	-0.06639 *** (0.00639)	-0.05655 *** (0.00689)
INF	Pre-Pandemic	0.58539 *** (0.12340)	0.18654 (0.16437)	0.39886 ** (0.17396)
	COVID-19 and post-COVID	-0.12416 *** (0.01946)	-0.18469 *** (0.02334)	0.06053 ** (0.02525)
	Total	-0.11141 *** (0.01977)	-0.21173 *** (0.02293)	0.10031 *** (0.02490)

IR	Pre-Pandemic	3.86055 *** (0.23121)	2.26368 *** (0.24821)	1.59687 *** (0.27814)
	COVID-19 and post-COVID	-0.75010 *** (0.05484)	-1.05833 *** (0.05777)	0.30823 *** (0.06178)
	Total	-0.43189 *** (0.03896)	-0.92583 *** (0.03903)	0.49394 *** (0.04325)
UNE	Pre-Pandemic	-0.02147 ** (0.01072)	-0.00792 (0.01203)	-0.01355 (0.01284)
	COVID-19 and post-COVID	-0.02495 *** (0.00381)	-0.00297 (0.00449)	-0.02198 *** (0.00485)
	Total	-0.03792 *** (0.00414)	-0.00725 * (0.00405)	-0.03067 *** (0.00460)
COV_dum	Pre-Pandemic	—	—	—
	COVID-19 and post-COVID	—	—	—
	Total	-0.00089 (0.00200)	0.02010 *** (0.00197)	-0.02099 *** (0.00216)
	Pre-pandemic	R^2 = 0.1949	R^2 = 0.0960	R^2 = 0.0675
		R^2 adj. = 0.1947	R^2 adj. = 0.0957	R^2 adj. = 0.0672
	COVID-19 and post-COVID	R^2 = 0.1891 R^2 adj. = 0.1889	R^2 = 0.1543 R^2 adj. = 0.1541	R^2 = 0.1012 R^2 adj. = 0.1009
	Total	R^2 = 0.1425 R^2 adj. = 0.1424	R^2 = 0.1047 R^2 adj. = 0.1046	R^2 = 0.0996 R^2 adj. = 0.0995

Notes: ***p < 0.01; **p < 0.05; *p < 0.1. Variables are total debt (TD), long-term debt (LTD), short-term debt (STD), profitability (PRO), size (SIZ), tangibility (TANG), liquidity (LIQ), age (AGE), inflation (INF), interest rate (IR), and the growth in the municipality's unemployment (UNE). Pre-Pandemic, COVID-19 and post-COVID periods correspond, respectively, to 2016-2019 and 2020-2023.
Source: Own elaboration.

Macroeconomic Determinants

Beyond internal characteristics, macroeconomic conditions significantly shape capital structure. A comparison between pre-Pandemic, COVID-19 and post-COVID estimates suggests that the relative importance of capital structure determinants differed across the two periods, consistent with the COVID-19 period being associated with changes in financing behavior. In the pre-pandemic period, leverage decisions were more strongly associated with traditional firm-specific characteristics, particularly size and tangibility, which reflected firms' access to collateral-based financing in a stable credit environment. In contrast, the COVID-19 and post-COVID results reveal a stronger influence of macroeconomic conditions, especially inflation, interest rates, and unemployment. This shift indicates that financing decisions became increasingly conditioned by external economic uncertainty and credit market conditions, reducing the explanatory power of conventional firm-level factors during the crisis period.

The findings reveal a consistent reduction in total debt during periods of high inflation, rising interest rates, and worsening unemployment. Specifically, the negative relationship between inflation and indebtedness leads to the rejection of hypothesis H7, contradicting predictions from the Trade-Off and Pecking Order theories, though consistent with prior studies (Bai &

Ho, 2022; Beck et al., 2008; Jõeveer, 2013; Neves et al., 2020). Inflation showed a mixed effect: reducing short-term borrowing while remaining positively associated with long-term debt, although the positive effect became substantially weaker in the COVID-19 and post-COVID period. Comparing between periods, it is interesting to observe a change in the coefficients' signs for the inflation and interest rate variables. The most notable sign reversal occurs for short-term debt, where the inflation coefficient changes from positive (and statistically insignificant) before the pandemic to significantly negative afterward. By contrast, the coefficient for long-term debt remains positive but declines substantially in magnitude.

Interest rates exhibit a strong negative effect on leverage, supporting hypothesis H8 and aligning with the Trade-Off theory: as borrowing costs increase, firms reduce debt use (Hatzinikolaou et al., 2002; Ramli et al., 2019). That negative relation is particularly relevant in the post-COVID-19 period. Higher unemployment is associated with lower debt levels, confirming hypothesis H9 and reflecting a cautious financial posture in response to labor market uncertainty (Vega-Gutierrez et al., 2021).

Short-term debt declines during inflationary periods, suggesting firms become more cautious about relying on short-term financing as inflation rises and economic uncertainty intensifies. Long-term debt, in contrast, remains positively associated with inflation, although the coefficient becomes substantially smaller in the COVID-19 and post-COVID period, indicating that inflation no longer provides the same incentive for longer-term borrowing observed before the pandemic. This attenuation likely reflects greater uncertainty about investment returns and future financing conditions, even though some studies (e.g., Muthama et al., 2013) suggest that firms may still pursue long-term financing under inflationary conditions. By comparison, rising interest rates and unemployment reduce short-term borrowing, supporting the view that firms avoid high-cost, short-term obligations in volatile environments.

Impact of the COVID-19 Pandemic

The inclusion of the COVID-19 dummy revealed no significant direct effect on overall debt levels. However, the comparison between pre-Pandemic, COVID-19, and post-COVID periods reveals changes in firms' capital structure decisions, providing evidence consistent with H1.

Using separate estimates for the pre-Pandemic (2016–2019) and COVID-19 and post-COVID (2020–2023) periods is intended to capture potential structural shifts in SME financing behavior associated with the COVID-19 shock. Rather than identifying only a direct level effect of the pandemic through the COVID dummy variable, the period-split approach allows the analysis to compare how the magnitude, direction, and statistical significance of the determinants evolved across different economic environments. This approach is particularly relevant in systemic crises, where changes in risk perception, credit

conditions, and financial constraints may alter the relative importance of firm-specific and macroeconomic drivers of capital structure decisions.

The coefficients in models with LTD and STD as dependent variables provide valuable insight into how firms responded to COVID-19. The significantly negative coefficient in the model with STD and the significantly positive coefficient in the model with LTD can be interpreted as an increase in debt maturity, a result in line with Palminha et al., 2027.

Notably, the negative relationship between profitability and indebtedness – particularly long-term debt – became more pronounced during COVID-19 and post-COVID, contrary to previous findings (Jain et al., 2024; Vo et al., 2022). This suggests a stronger preference for internal financing amid heightened uncertainty, aligning with the Pecking Order theory (Alhajjeah & Besim, 2024).

The estimated coefficients for asset tangibility and firm size are smaller in the COVID-19 and post-COVID period, reflecting reduced creditor reliance on physical collateral and possibly tighter lending criteria, especially in the Portuguese SME context (Ahmed et al., 2024; Gao & Tsusaka, 2023). Older firms further distanced themselves from debt, except in short-term financing, highlighting conservative financial behavior tempered by liquidity needs during crises.

A COVID-19 and post-COVID shift also emerged in how firms respond to macroeconomic conditions. Whereas pre-pandemic borrowing sometimes increased despite rising interest rates and inflation (Daskalakis et al., 2017; Mokhova & Zinecker, 2014), the crisis ushered in greater caution, consistent with the Trade-Off theory (Panda & Nanda, 2020). Inflation, once seen as a tool to erode real debt, is now perceived as a source of financial risk (Neves et al., 2020). Similarly, rising unemployment has become a stronger deterrent to short-term debt, indicating greater sensitivity to labor market signals and an effort to avoid workforce reductions (Agrawal & Matsa, 2013; Vega-Gutierrez et al., 2021).

Interestingly, the COVID-19 dummy lacked statistical significance, suggesting the pandemic's impact was not direct but mediated through shifts in firm behavior and risk perception. The different signs of the coefficient in the models with STD and LTD suggest a strategic move to stabilize financing and increase the debt maturity, likely facilitated by public support measures implemented in a scenario of high operational uncertainty (Alhajjeah & Besim, 2024; Palminha et al., 2027; Vo et al., 2022).

CONCLUSIONS

In a context of heightened economic uncertainty, this study examined how the COVID-19 pandemic influenced the determinants of capital structure among Portuguese industrial SMEs (2016–2023). Using panel data for 7,006 firms and a fixed effects model, the analysis incorporated firm-specific (profitability, size, tangibility, liquidity, age) and macroeconomic variables (inflation, interest rates, unemployment).

The results show that profitable, mature, and liquid firms tend to avoid debt, while larger and more asset-heavy firms are more likely to borrow, particularly long-term. However, macroeconomic instability led to overall deleveraging. Comparing the pre-Pandemic, COVID-19, and post-COVID estimates, macroeconomic variables appear more influential in the later period, suggesting a shift toward more risk-averse financing behavior. While the COVID-19 dummy was not statistically significant, segmented analysis revealed changes in capital structure dynamics, namely, a slight rise in long-term and a decline in short-term debt, likely linked to public support measures and precautionary strategies. These findings reaffirm the relevance of Pecking Order and Trade-Off theories, especially when adapted to crisis contexts.

The results highlight the importance of financial flexibility for SMEs operating in bank-based economies, where access to external finance depends heavily on credit conditions. The stronger negative relationship between profitability and leverage in the COVID-19 and post-COVID period suggests that firms with greater internal funding capacity were better able to cope with uncertainty. From a managerial perspective, this underscores the need to prioritize retained earnings, liquidity buffers, and prudent cash-flow management as key elements of financial resilience.

The shift from short-term to long-term debt, despite relatively stable overall leverage, highlights the strategic importance of debt maturity management. In a bank-centered financial system, extending debt maturities can reduce refinancing risk and vulnerability to sudden tightening in credit supply. SME managers should therefore focus not only on the level of indebtedness but also on its maturity structure, aligning financing decisions with investment horizons and expected cash flows.

The weakened role of asset tangibility and firm size during the COVID-19 and post-COVID period suggests that traditional collateral-based lending became less decisive during systemic shocks. This implies that SMEs should not rely exclusively on physical assets to secure bank financing in crisis contexts, but instead strengthen financial transparency, operating performance, and long-term banking relationships as alternative signals of creditworthiness.

From a policy perspective, the heightened influence of macroeconomic variables indicates that inflation, interest rates, and labor market conditions significantly affect SME leverage decisions in bank-based economies. Policy measures implemented during the pandemic appear to have supported financing stability by facilitating longer debt maturities rather than increasing overall indebtedness. Future interventions should continue to focus on maturity extension and risk mitigation mechanisms, such as credit guarantees, to enhance SME resilience during periods of economic stress.

Limitations include the exclusive use of quantitative accounting data and a broad COVID-19 and post-COVID period definition that may overlook temporal nuances. Future research could expand into other sectors and explore the role of public policy in financial resilience. In addition, the balanced-panel structure of the sample implies that only firms continuously observed throughout the 2016–2023 period were retained. This may introduce potential survivorship or selection effects, as SMEs that exited the market during the crisis are not represented in the analysis. Consequently, the findings may better reflect the financing behavior of relatively more resilient firms, limiting the generalizability of the results under severe crisis conditions. In sum, the study provides evidence of SMEs' ability to strategically adjust their capital structures in response to shocks, reflecting not only financial constraints but also deliberate resilience strategies.

Conflict of Interest Statement

The authors declare no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethics Statement

This study did not involve human participants or animals, and therefore ethical approval was not required.

Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

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Customer Satisfaction and Financial Inclusion: The Role of Service Quality in Non-Banking Correspondents

Satisfacción del cliente e inclusión financiera: el papel de la calidad del servicio en los corresponsales no bancarios

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ABSTRACT

This research analyzes the relationship between customer satisfaction with non-banking correspondent services and financial inclusion. This study used the SERVQUAL model to measure customer satisfaction and analyzed its relationship with financial inclusion using partial least squares structural equation modeling (PLS-SEM), based on a stratified sample of 221 users of 24 non-banking correspondents. The results show that customer satisfaction is associated with financial inclusion through the quality of the physical and personal environments, which predominated as the most significant factor, and that all constructs clearly explain the latent variables. Furthermore, it became clear that inclusion is driven not only by financial infrastructure but also by a behavioral process of user perception, measured by satisfaction. Therefore, it is necessary to develop an ecosystem of experiences that ensures staff quality, environment, functional quality, access, product adaptation, and consumer protection, among other aspects that holistically integrate this ecosystem. This will provide a strategic framework for designing inclusive financial policies.

Keywords: Financial inclusion; Service quality; Customer satisfaction; Financial services; SERVQUAL

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RESUMEN

Esta investigación busca analizar la relación entre la satisfacción de los clientes con los servicios de corresponsales no bancarios y la inclusión financiera. Se utilizó el modelo SERVQUAL para medir la satisfacción del cliente y se analizó su relación con la inclusión financiera mediante ecuaciones estructurales de mínimos cuadrados parciales (PLS-SEM) basadas en una encuesta aplicada a 221 usuarios de 24 corresponsales no bancarios, con una muestra estratificada. Los resultados mostraron que la satisfacción del cliente influye en la inclusión financiera a través de la calidad del entorno físico y personal, lo cual se considera el factor más significativo. Todos los constructos explican las variables latentes. Además, se evidenció que no solo la infraestructura financiera articula la inclusión, sino también un proceso conductual de percepción del usuario, medido por la satisfacción, por lo que es necesario desarrollar un ecosistema de experiencias que garantice la calidad del personal y del entorno, la calidad funcional, el acceso, la adaptación del producto y la protección al consumidor. Con ello se podrá establecer un marco estratégico para el diseño de políticas financieras inclusivas.

Palabras clave: Inclusión financiera; Calidad del servicio; Satisfacción del cliente; Servicios financieros; SERVQUAL

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INTRODUCTION

Financial inclusion has become a key factor in economic development and social stability, as it enables individuals and small businesses to better manage risks, save, and participate more actively in the formal economy (Demirgüç et al., 2022; Cipoletta & Matos, 2018). However, recent studies indicate that access to financial services does not guarantee consistent use or that people will remain within the system, especially in countries with high levels of informality and institutional weaknesses (Demirgüç et al., 2022; Carè et al., 2025). For this reason, financial inclusion is no longer understood simply as having a bank account, but as a broader concept that considers access, actual use, and quality of service, making user experience a fundamental element in understanding it (Cipoletta & Matos, 2018).

At the same time, the global financial system is undergoing profound changes driven by digitalization, FinTech, and the advance of open finance models. Empirical evidence shows that allowing accredited intermediaries access to financial data can increase competition, optimize credit conditions, and expand opportunities for traditionally rejected sectors (Babina et al., 2024). Similarly, new systematic explorations indicate that the relationship between the financial technology system and inclusion is a dynamic field of research, highlighting the role of innovation in reducing transaction costs and information asymmetries (Carè et al., 2025). However, these structural advances alone do not ensure sustained adoption or positive integration into the financial system.

Recent evidence on digital finance reinforces the need to analyze financial inclusion beyond channel availability. Dias and Perera (2026), through a systematic review of Scopus-indexed studies, identify mobile banking, e-wallets, electronic banking, agent banking, and online transfers as mechanisms that can expand financial inclusion by improving accessibility, availability, and quality of use. However, their findings also warn that digital financial illiteracy, regulatory constraints, socioeconomic disparities, and infrastructure limitations may restrict the benefits of these channels for vulnerable groups. This perspective strengthens the relevance of analyzing non-banking correspondents as hybrid service points, since they operate at the intersection between digital financial expansion, territorial access, and the user's concrete service experience.

The Ecuadorian context also provides recent empirical support for examining the link between financial inclusion and the transformation of banking services. Proaño and Feria (2026), using panel data from 24 private commercial banks in Ecuador between 2019 and 2022, show that financial inclusion is positively associated with asset profitability, while digital transformation is significantly related to return on equity among lower-performing banks. These results suggest that inclusion-oriented and digitally enabled strategies may act

as stabilization mechanisms in small, dollarized, and institutionally constrained financial systems. Therefore, studying customer satisfaction among users of non-banking correspondents is relevant not only from a service-quality perspective but also for understanding whether inclusive financial channels generate experiences that support sustained participation in the formal system.

From a behavioral perspective, studies on financial services agree that perceived quality and satisfaction are decisive factors in users' continued use of these services. Recent research, supported by structural models, shows that higher service quality directly affects customer satisfaction and that this satisfaction, in turn, influences the intention to remain with and continue using digital financial services (Pokhrel & Anup, 2024; Sharma et al., 2024). Similarly, studies in both traditional and digital banking confirm that the user experience—reflected in the reliability, security, responsiveness, and smooth operation of the service—is a solid indicator of customer satisfaction and loyalty (Silva et al., 2021; Brady & Cronin, 2001).

From a theoretical perspective, customer satisfaction is based on the expectancy-disconfirmation theory, which holds that people evaluate a service by comparing what they expected to receive with the performance they actually observe (Parasuraman et al., 1988; Kotler & Armstrong, 2018). This approach has been developed in the financial sector to incorporate relational and emotional aspects linked to trust, transparency, and transaction security (Yas et al., 2020; Tedja et al., 2024). Thus, satisfaction is not only a final assessment of the service but also a mechanism that links perceived quality to future user behavior, such as frequency of use and acceptance of new products.

Recently, network analysis-based approaches have sought to understand satisfaction as a central element within a complex set of service attributes, especially in multichannel banking environments where digital media, physical branches, and other alternative channels coexist (Moraes & Schaefer, 2026). This general view is particularly important in emerging economies, where digitization coexists with face-to-face schemes, such as non-banking correspondents, creating hybrid financial experiences.

In developing countries, non-banking correspondents have been promoted as key tools for extending coverage and reducing geographical barriers to access to financial services (Cipoletta & Matos, 2018). The non-banking correspondents are third-party agents, usually small shop owners in rural and semi-urban areas, who deliver banking services at locations other than bank branches or ATMs (Uzma & Pratihari, 2019). However, regional literature indicates that their effectiveness depends largely on service efficiency and user perceptions, especially in contexts marked by institutional mistrust or low levels of financial education (Vallejo et al., 2021; Calle & Montenegro, 2020). Thus, financial inclusion cannot be

measured solely by infrastructure indicators but must also consider the subjective dimension of the customer experience.

In Ecuador, although progress has been made in expanding service provision and increasing the number of financial institutions, significant levels of exclusion and restricted use of formal services remain among certain population groups (Demirgüç et al., 2022; Bonilla et al., 2025). This suggests that sustainable financial integration depends not only on service availability but also on users' satisfaction with their interactions with the system. International evidence suggests that when the experience is negative, formal access does not necessarily translate into frequent use or genuine financial consolidation (Carè et al., 2025; Pokhrel & Anup, 2024; Sharma et al., 2024).

As a result, combining organized perspectives on financial inclusion with behavioral guidelines based on customer satisfaction facilitates a more comprehensive understanding of the phenomenon. While studies on open finance and FinTech explain changes in the financial system's structure (Babina et al., 2024; Carè et al., 2025), service efficacy theory provides a framework for examining how user experience influences adoption and retention within the system. From this integrative approach, the present study analyzes the relationship between customer satisfaction and financial inclusion among users of non-banking correspondents in Ecuador, contributing to the current debate through a structural equation model that links experience dimensions to financial inclusion outcomes in an emerging context.

This study makes several contributions. First, it expands the literature on financial inclusion by linking it to customer satisfaction through the SERVQUAL model, arguing that inclusion depends not only on technology and infrastructure but also on the user’s perceived experience. It also provides evidence on non-banking correspondents, a context that has been scarcely studied and which, combined with a structural equation model, offers a level of methodological rigor and thematic depth not previously addressed. Finally, the results offer implications for banking institutions, decision-makers, and public policy legislators by showing that the non-banking correspondent strategy strengthens service quality, personal interaction, accessibility, and product adaptation, which promotes more robust, user-oriented financial inclusion.

CUSTOMER SATISFACTION AND FINANCIAL INCLUSION: THEORETICAL FOUNDATION

Financial inclusion can be understood as a process in which individuals and businesses have access to and can use formal financial services that meet their needs, under the criteria of security, transparency, and sustainability. At the regional level, Cipoletta and Matos (2018) suggest that it should be analyzed based on three essential dimensions: access, use, and quality, emphasizing that having financial infrastructure does not necessarily imply true integration into the system. Similarly, Demirgüç et al. (2022) point out that financial inclusion is a key element of economic development because it helps manage risks, encourage savings, and promote productive participation. Therefore, the literature agrees that opening bank accounts is not enough; users' actual experience within the financial system is also important.

In Latin America, academic debate has been moving toward approaches that combine institutional and behavioral factors to analyze financial inclusion. Vargas et al. (2024) point out that structural determinants—such as regulation, digitization, and infrastructure—should be integrated with variables related to user trust and the user's perception. Thus, studying financial inclusion also involves considering macroeconomic perspectives that reveal not only initial entry into the system but also active permanence and continued use of formal financial services.

In this context, non-banking correspondents have been identified as tools for expanding the financial system's presence in the territory. Cipoletta and Matos (2018) note that these means help minimize operating costs and extend coverage in rural areas or areas with limited banking presence, thereby promoting access to financial services where traditional infrastructure is limited. However, the literature highlights that their effectiveness is largely driven by the quality of service and the user experience at the point of service, which are directly related to customer satisfaction.

In theory, the quality dimension of financial inclusion relates to products being convenient for users, information being clear, costs being reasonable, and trust in the institution (Cipoletta & Matos, 2018). This idea aligns with open finance and financial digitization, in which interoperability, clarity, and data portability foster competition and optimize the user experience (Liu & Li, 2025). However, the literature agrees that technology contributes to inclusion only when it goes hand in hand with positive customer perceptions of the service they receive.

Recent open banking evidence also supports a multidimensional view of financial inclusion. Ryan and Mukherjee (2026) find, using a large cross-country panel, that open banking adoption increases the percentage of adults making or receiving digital payments, with particularly visible effects among less-educated adults. At the same time, the authors report no statistically significant effect on the number of mobile or internet banking transactions per 1.000 adults, suggesting that inclusion gains may emerge through broader payment behavior and non-bank channels rather than through formal banking transactions alone. This distinction is relevant for non-banking correspondents, because it supports the idea that access and use must be interpreted together with the type of channel through which users actually interact with financial services.

From a user experience perspective, El Amri et al. (2026) demonstrate, using structural equation modeling, that access to digital financial services, beliefs about those services, and safety measures positively influence individuals' personal experience of adopting digital payments. Their findings are especially useful for this study because they connect technical access with subjective dimensions such as convenience, security, efficiency, trust, and satisfaction. In this sense, customer satisfaction can be understood not only as a post-service evaluation, but also as the result of a broader interaction among perceived accessibility, security, confidence in the channel, and the usefulness attributed to the financial service.

From a service management perspective, customer satisfaction has been extensively studied as an assessment that arises after service use. Parasuraman, Zeithaml, and Berry (1988) developed the SERVQUAL model, which posits that perceived quality results from comparing what the user expected with what they actually experienced, considering aspects such as reliability, responsiveness, assurance, empathy, and tangibles. Later, the SERVPERF model was proposed, which posits that directly evaluating perceived performance is sufficient to calculate satisfaction. Both approaches agree that the service experience is key to forming the customer's evaluative judgment.

In recent experimental research, Silva et al. (2021) draw a relevant analogy among service quality, satisfaction, and subsequent customer behavior, confirming that perceived quality directly precedes satisfaction. Similarly, Vargas and Aldana (2013) note that service quality functions as an integrated system that combines processes, the physical environment, and human development, highlighting the need to evaluate it across multiple dimensions. These perspectives are particularly relevant in the financial sector, where service extends beyond transactional activity to include relational and trust components.

In the financial sector, customer satisfaction has a particular meaning linked to how customers perceive the security, transparency, and efficiency of operations. The Guide to Direct Measurement of Customer Satisfaction (González et al., 2007) highlights that

methodical evaluation of satisfaction is an important tool for strengthening loyalty and optimizing internal processes. Similarly, research such as that by Silva et al. (2021) shows that satisfaction is not only a final assessment of the service but also a factor influencing the prolongation of the relationship between the user and the institution.

Consumer behavior theory explains the relationship between customer satisfaction and financial inclusion: when the service experience is positive, users are more likely to use it again and recommend it to others. In the financial sphere, this is reflected in increased repeat transactions, the adoption of new products, and continuity within the formal system. Vargas et al. (2024) indicate that sustainable financial inclusion requires a combination of technological and institutional elements with the user's intrinsic experience, underscoring the importance of incorporating behavioral variables into explanatory models.

Furthermore, existing documentation on digital finance indicates that technological reinvention, encompassing open finance models, can extend access to financial services by reducing costs and increasing transparency (Liu & Li, 2025). However, these benefits are strengthened only when users experience efficiency and reliability in service channels, including non-bank correspondents. Thus, satisfaction acts as a springboard between structural innovation in the financial system and effective user inclusion.

Consequently, from an integrative perspective, customer satisfaction and financial inclusion are closely related concepts in financial services. The theory posits that a positive experience reinforces trust, promotes frequent use, and encourages permanence within the formal system, especially through decentralized channels such as non-bank correspondents. With this conceptual support, analyzing both constructs together allows for a better understanding of the mechanisms that drive sustainable financial inclusion in the Ecuadorian context.

METHODOLOGY

Study Area

This study was carried out in the canton of Samborondón, Guayas province, Ecuador. The canton covers 252 square kilometers, including urban areas (parishes of Samborondón) and rural areas (parish of Tarifa). Samborondón has a population of 102.404 inhabitants, with the urban area accounting for the majority, 72.425 inhabitants (70,72%). However, the canton is characterized by rice production. The canton is located near Guayaquil, the country's most populous city (approximately 3.244.750 inhabitants), which is why Samborondón has become urbanized due to the growth of private residences. In other words, Samborondón's economy is divided between residential areas and agricultural activity. The research was

geographically limited to the parish of Samborondón, within an 18-26 kilometer radius of the cantonal capital.

Data Collection

The data were collected from October 28 to November 7, 2024, in two stages: first, all non-banking correspondents in the study area; and then, a representative sample of their users. The data are cross-sectional, meaning they are collected at a single point in time and describe users' perceptions of service quality and satisfaction with non-banking correspondents. The data were collected under strict privacy agreements, as explicitly stated in the informed consent process, which guarantees the protection of respondents' personal information.

Non-banking correspondents

The study included 24 non-banking correspondents in the canton of Samborondón, belonging to Banco de Guayaquil (Banco del Barrio) and Produbanco (Pago Ágil). On average, Banco de Guayaquil and Produbanco accounted for 13% and 7% of customers in Ecuador in 2024, respectively. In addition, both accounted for 12% of the country's balances each. These entities are among the four non-banking correspondent entities in the country (Superintendencia de Bancos, 2025). Banco de Guayaquil has 5,200 non-banking correspondents nationwide. Banco del Barrio covers most establishments (75%) in the study area, as shown in Table 1.

Table 1
Number of non-banking correspondents distributed in Samborondón

Non-banking correspondents	Number of Correspondents	Participation
Banco del Barrio	18	75%
Pago Ágil	6	25%
Total	24	100%

Source: Servicio de Rentas Internas (2024)

Users

Based on surveys of 24 non-banking correspondents, we projected a total of 1.250 daily users for this service. This estimate is based on the average daily number of service users (Table 2). In this context, a representative sample of 221 users was obtained, calculated using simple random sampling with the following equation (1):

$$n = \frac{\frac{z^2 \cdot p(1-p)}{e^2}}{1+\frac{z^2 \cdot p(1-p)}{e^2 N}} \quad (1)$$

Where N is the population size (1,250 users), e is the margin of error (6%), z is the z-score corresponding to a 95% confidence level (z=1.96), and n is the sample size.

Table 2
Projected daily users of non-banking correspondents in the Samborondón canton

Users per day (average)	Banco del Barrio	Pago Ágil	Total number of correspondents	User projection	Participation
20	0	2	2	40	3.20%
40	6	5	11	440	35.20%
70	10	1	11	770	61.60%
Total	16	8	24	1250	100%

Source: own elaboration

In addition, a stratified sample was calculated based on the percentage share of non-banking correspondents in the study area (Table 3). In this case, Banco del Barrio had a 75% share, while Pago Ágil had a 25% share.

Table 3
Stratified sample by non-banking correspondent

Non-Banking Correspondent	Sample
Banco del Barrio	166 users
Pago Ágil	55 users
Total	221 users

Source: own elaboration.

Missing values in responses to certain questionnaire items were imputed using mode imputation, which replaces missing values with the mode of the available data for categorical variables (Mehmetoglu & Venturini, 2021). Of the 4,420 total data points (221 respondents × 20 items), only 5 values were missing (0.113%), appearing randomly distributed across items and respondents with no systematic pattern associated with any particular construct or subgroup. Under these conditions, mode imputation is a conservative and appropriate strategy for Likert-scale data, as it preserves the distributional properties of ordinal responses without introducing artificial variance.

Methods of Analysis

This research is based on a descriptive and correlational study that analyzes the relationship between customer satisfaction with non-banking correspondent services and financial inclusion. To this end, the SERVQUAL model, a validated tool for customer satisfaction studies (Brady & Cronin, 2001), and the concept of financial inclusion, with its dimensions of access, use, and quality (Cipoletta & Matos, 2018), were used.

SERVQUAL Model – Customer Satisfaction

The SERVQUAL model facilitates the evaluation of various aspects of service quality perceived by customers in the banking sector, providing valuable information to improve customer satisfaction (Fida et al., 2020; Alday, 2024; Bhuvaneswari & Maruthamuthu, 2024). Thus, the SERVQUAL model is suitable for studying non-banking correspondent services, as it enables us to assess satisfaction levels with these services. According to Brady

and Cronin (2001), customer satisfaction encompasses three dimensions: physical environment quality, functional quality, and staff quality. In terms of the quality of the physical environment, there are three components: the environmental (v1), which includes factors such as temperature, lighting, and the adequacy of the infrastructure; cleaning (v2), related to the hygiene of the space; and design (v3), which refers to the architecture or infrastructure appropriate to the service (Fida et al., 2020).

Functional quality includes the components of services, products, prices, and access. The service component (v4) is linked to the management of financial services, while the product component (v5) refers to the services offered by non-banking correspondents. The price component (v6) refers to fees charged for services, and the access component (v7) refers to waiting time for financial transactions (Alday, 2024).

Finally, staff quality includes the components of image, technical knowledge, and empathy. Image (v8) relates to staff appearance; the techniques (v9) relate to staff ability; and, finally, the empathy component (v10) relates to staff willingness to help the customer (Bhuvaneswari & Maruthamuthu, 2024; Silva et al., 2021). All components of customer satisfaction were evaluated using a Likert scale, where 1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, and 5 = Strongly agree. Table 4 presents the statistical description of the SERVQUAL model indicators used in the study.

Table 4
Descriptive Statistics of SERVQUAL Model Components in Customer Satisfaction

Constructs	Mean	SD	Min	Max
Physical quality of environment				
Environmental (v1)	3.64	0.998	1	5
Cleaning (v2)	3.47	1.130	1	5
Design (v3)	3.58	1.086	1	5
Functional Quality				
Services (v4)	3.55	1.097	1	5
Products (v5)	3.46	1.046	1	5
Prices (v6)	3.57	1.088	1	5
Access (v7)	3.49	1.098	1	5
Staff quality				
Image (v8)	3.57	1.121	1	5
Techniques (v9)	3.57	1.096	1	5
Empathy (v10)	3.49	1.139	1	5

Note: Customer satisfaction components were evaluated using a Likert scale, where 1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor agree, 4 = Agree, and 5 = Strongly agree
Source: own elaboration.

Financial Inclusion

Financial inclusion encompasses several dimensions: access, use, and quality (Cipoletta & Matos, 2018; López et al., 2023). The dimension of access refers to whether individuals and businesses can access financial services, which depends on physical proximity to these services in a given geographic area, the availability of bank branches, ATMs, and mobile money agents, as well as regulatory environments that facilitate such access (López et al.,

2023; Sharma & Changkakati, 2022). In this study, to determine levels of access, satisfaction with access (v11), possibility of use (v12), and ease of access (v13) to the services and products offered by non-banking correspondents were identified (Alday, 2024).

The usage dimension focuses on the adoption and frequent use of financial services such as savings accounts, digital payments, credit, and insurance (López et al., 2023; Sharma & Changkakati, 2022). This study examined users' use (v14), regularity (v15), and adaptation (v16) of the services offered by financial correspondents (Alday, 2024).

The quality dimension assesses whether financial products are adequate, affordable, and tailored to users' specific needs, ensuring their safe and sustainable provision. Thus, it analyzes how financial services meet users' expectations and needs from perspectives such as consumer protection, supervision, regulation, and variability. This dimension is used to assess the characteristics and depth of the relationship between the customer and the bank and to implement policies for continuous improvement in service delivery (López et al., 2023).

The study considered the components of variety (v17), which refers to the diversity of services offered by non-banking correspondents; regulation (v18), which refers to compliance with security standards; supervision (v19), which relates to regulatory monitoring; and consumer protection (v20), which refers to the protection of consumer rights with regard to the services offered by non-banking correspondents (Alday, 2024). The components of financial inclusion were assessed using a Likert scale, with 1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, and 5 = Strongly agree. Table 5 describes the indicators used to assess the dimensions of financial inclusion.

Table 5
Descriptive statistics for financial inclusion indicators

Constructs	Mean	SD	Min	Max
Access				
Satisfaction with access (v11)	3.51	1.13	1	5
Possibility of use (v12)	3.51	1.13	1	5
Ease of access (v13)	3.72	1.03	1	5
Use				
Use (v14)	3.62	1.14	1	5
Regularity (v15)	3.54	1.12	1	5
Product adaptation (v16)	3.63	1.06	1	5
Quality				
Variety (v17)	3.46	1.18	1	5
Regulation (v18)	3.57	1.16	1	5
Supervision (v19)	3.50	1.23	1	5
Consumer protection (v20)	3.36	1.15	1	5

Source: Own elaboration. Note: The financial inclusion components were evaluated using a Likert scale, where 1 = Strongly disagree, 2 = Disagree, 3 = Neither agree nor disagree, 4 = Agree, and 5 = Strongly agree.

The statistical method used to analyze the relationship between customer satisfaction and financial inclusion was partial least squares structural equation modeling (PLS-SEM), as it allows modeling when data do not meet normality assumptions. Normality was assessed using the Shapiro-Wilk test and the skewness and kurtosis tests. Most variables had p-values < 0.05, indicating deviations from normality (Table A1, Appendix). Mardia's multivariate normality test (mvtest normality) indicated that the data did not follow a multivariate normal distribution ($p < 0.05$). Additionally, the descriptive analysis showed skewness values between -0.65 and -0.23, while kurtosis ranged from 2.13 to 2.90 (Table A1, Appendix), both above the acceptable value of 2. Thus, we chose PLS-SEM, as it is appropriate for this type of scale and distribution (Sarstedt et al., 2022).

Based on the customer satisfaction theory (SERVQUAL model) and financial inclusion, we adopted a second-order reflective model in which customer satisfaction (CS) and financial inclusion (FI) are conceptualized as latent constructs that manifest through their corresponding dimensions (Figure 1). We performed PLS-SEM analyses using SmartPLS 4.0 to evaluate the measurement and structural models (Ringle et al., 2024; Venturini et al., 2023) using an accelerated Bootstrap resampling procedure with bias correction (BCa), with 5000 samples, a significance level of 0.05, and a two-tailed test. The higher-order constructs were estimated using the two-stage approach in SmartPLS 4, whereby latent variable scores obtained for each first-order construct in the first stage were used as single indicators of the higher-order construct in the second stage, accounting for the fixed loadings of 1.000 observed for CS_m and FI_m in the model (Hair et al., 2019).

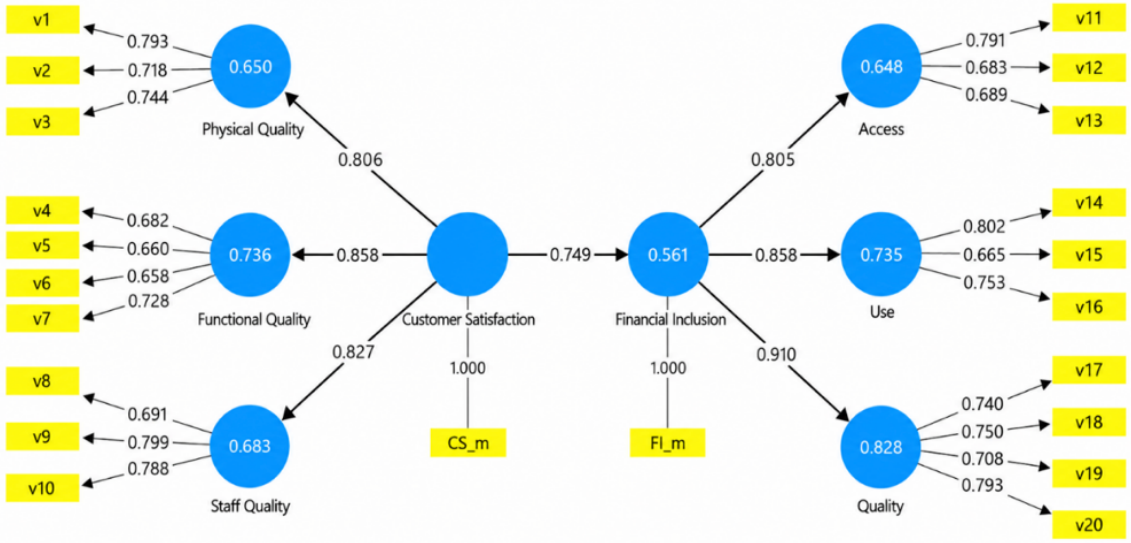
To assess potential common method bias, we employed a collinearity-based approach following the recommendations of Kock (2015). Outer model collinearity statistics (VIF) for all indicators were below 1.416, well under the conservative threshold of 3.3, and inner model collinearity statistics (VIF) for all structural paths were equal to 1.000, providing no statistical evidence of common method bias in the data. At the procedural level, participants were guaranteed full anonymity before completing the survey (no personal data was collected at any stage), and they were explicitly informed that there were no correct or incorrect answers, reducing social desirability bias and acquiescence effects.

RESULTS

Measurement model

The statistical techniques used to evaluate the measurement model were factor loadings, internal consistency, convergent validity, and discriminant validity. Most factor loadings exceeded the 0.70 threshold and were statistically significant ($p<0.01$), indicating satisfactory indicator reliability (Figure 1, Table 6). Only seven variables had loadings slightly below 0.70, indicating that they contribute less to the different dimensions. However, values between 0.6 and 0.7 are acceptable in exploratory research (Hair et al., 2019), as is the case with the proposed integration between customer satisfaction and financial inclusion, which is considered acceptable.

Figure 1
Validation of the customer satisfaction pathway model in financial inclusion (Outer loadings)



Source: Own elaboration. Note: Results obtained in SmartPLS 4 (Ringle et al., 2024); CS = Customer Satisfaction; FI = Financial Inclusion

For internal consistency (Table 6), Cronbach's alpha coefficients and composite reliability (rho_c) were computed; for convergent validity, average variance extracted (AVE) was computed (Gupta & Kiran, 2024). Cronbach's alpha coefficients were acceptable, ranging from 0.6 to 0.74, given the exploratory nature of the research (Hair et al., 2019). However, composite reliability values (rho_c) exceeded the threshold of 0.70 in all constructs. Convergent validity was adequate, with AVE values between 0.52 and 0.58, above the criterion of 0.50, except in the Functional Quality dimension, which had a value of 0.47 (Hair et al., 2019). Discriminant validity was assessed according to the Fornell-Larcker criterion (Table 7). In all cases, the square root of the AVE for each construct was greater than its

correlations with the other constructs (Fornell & Larcker, 1981). These results show adequate discriminant validity.

Table 6
Reliability and convergent validity results

Construct	Variables	Loadings	Cronbach's Alpha	Composite reliability (rho_c)	AVE
Customer satisfaction	Physical Quality of environment	0.806***	0.615***	0.796***	0.566***
	v1	0.793***			
	v2	0.718***			
	v3	0.744***			
	Functional Quality	0.736***	0.617***	0.777***	0.466**
	v4	0.682***			
	v5	0.660***			
	v6	0.658***			
	v7	0.728***			
	Staff Quality	0.827***	0.632***	0.804***	0.579***
	v8	0.691***			
	v9	0.799***			
	v10	0.788***			
Financial inclusion	Access	0.805***	0.540***	0.766***	0.522***
	v11	0.791***			
	v12	0.683***			
	v13	0.689***			
	Use	0.858***	0.587***	0.785***	0.551***
	v14	0.802***			
	v15	0.665***			
	v16	0.753***			
	Quality	0.910***	0.737***	0.836***	0.560***
	v17	0.740***			
	v18	0.750***			
	v19	0.708***			
	v20	0.793***			

Source: Own elaboration. Note: *** p<0.01

Evaluation of the structural model

Table 8 presents the coefficients and t-values for each path. Customer satisfaction had a positive and significant effect on financial inclusion among non-banking correspondents in the canton, with a coefficient of 0.748 ($p < 0.01$). The model explains 56.1% of the variance in financial inclusion ($R2 = 0.561$), indicating moderate predictive power (Hair et al., 2019).

Additionally, Table 7 presents the path coefficients between the higher-order constructs and their first-order dimensions. All path coefficients are significant at the $p < 0.01$ level, consistent with a second-order reflective specification in which the higher-order construct manifests through its dimensions (Hair et al., 2019). Financial inclusion shows significant paths to access (0.805; 95% CI = 0.747, 0.850), quality (0.910; 95% CI = 0.885, 0.928), and use (0.858; 95% CI = 0.812, 0.891). Similarly, customer satisfaction shows significant paths to physical environment quality (0.806; 95% CI = 0.755, 0.844), functional quality (0.858; 95% CI = 0.797, 0.893), and staff quality (0.827; 95% CI = 0.785, 0.859). These coefficients

are higher than those obtained for the relationship between customer satisfaction and financial inclusion (0.748; 95% CI = 0.662, 0.815).

Table 7
Discriminant Validity

Construct	Physical quality	Functional quality	Staff quality	Access	Use	Quality
Physical quality	**0.752**					
Functional quality	0.529	**0.683**				
Staff quality	0.524	0.555	**0.761**			
Access	0.404	0.543	0.509	**0.724**		
Use	0.474	0.544	0.665	0.569	**0.743**	
Quality	0.473	0.566	0.635	0.578	0.682	**0.748**

Note: Bold values are square roots of the AVEs; the values below the diagonal are the correlation coefficients between the variables.
Source: Own elaboration.

As a sensitivity check, the model was re-estimated using the original dataset without imputation, allowing SmartPLS 4 to handle missing values via pairwise deletion. The resulting path coefficient (CS → IF: $\beta = 0.749$, $p < 0.01$) and explained variance ($R^2 = 0.560$) were virtually identical to those reported in the main analysis (Table 8), confirming that the findings are robust to the imputation choice (Table A2 in Appendix).

Table 8
Structural Model Results

Path	Original sample	Sample mean	Standard deviation	T statistics	CI lower	CI upper
FI -> Access	0.805	0.805	0.026	31.023***	0.747	0.850
FI -> Quality	0.910	0.910	0.011	84.577***	0.885	0.928
FI -> Use	0.858	0.857	0.020	42.750***	0.812	0.891
CS -> Physical	0.806	0.806	0.023	35.337***	0.755	0.844
CS -> Functional	0.858	0.858	0.023	36.579***	0.797	0.893
CS -> Staff	0.827	0.827	0.019	44.306***	0.785	0.859
CS -> IF	**0.749**	**0.748**	**0.039**	**19.149*** **	0.662	0.815

Note: FI Financial inclusion, CS Customer satisfaction; *** p<0.01; IF (R2=0.561); SRMR=0.09
Source: Own elaboration.

DISCUSSION

This study analyzed customer satisfaction and its relationship with financial inclusion. The results show a significant association between the variables, explained through dimensions and together describing a unique model that, from the user's perspective, predicts and explains the mechanisms underlying financial inclusion. The proposed model is supported by a substantial explained variance, positioning these results as valid theories for designing public policies and inclusion strategies.

These results align with recent evidence indicating that financial inclusion depends on the interaction among service channels, user perceptions, and institutional conditions. Dias and Perera (2026) argue that digital financial mechanisms can expand inclusion by improving

accessibility and the quality of use, but only under adequate regulatory, technological, and educational conditions. Similarly, Proaño and Feria (2026) show that, in Ecuador, financial inclusion and digital transformation may contribute to the stability of banking institutions, particularly in more vulnerable segments of the financial system. From this perspective, the present findings suggest that customer satisfaction is not an isolated attitudinal outcome but a behavioral and relational mechanism that can help explain why users remain connected to inclusive financial channels such as non-banking correspondents.

Although the model as a whole is robust and holistic, it is necessary to break down its constituent elements, given that the results are not entirely homogeneous. It is important to capture nuances in the different contributions across dimensions. In this sense, the quality of the physical environment is the strongest predictor of the latent variable. This is composed of atmosphere, cleanliness, and design, which predominate due to their significance throughout the model.

This dimension supports the first assertion: trust generated by an orderly and secure environment is associated with greater financial inclusion. The finding reinforces previous studies showing that the tangible aspects of the service build trust, loyalty, and satisfaction toward the bank (Ceseña, 2020; Calle & Montenegro, 2020). Furthermore, it aligns with the findings of Wang et al. (2023), as a negative experience attributed to neglected environments reflects a lack of professionalism and, in turn, mistrust in service use. Therefore, having positive perceptions of the environment in which non-banking correspondents operate is positively associated with financial inclusion.

In contrast, staff quality shows a strong influence in the model. This includes dimensions such as image, techniques, and empathy, with empathy standing out as the most significant. This shows that, for users, the human component transcends efficiency; they value the guidance and personalization provided by the non-banking correspondent more than transaction speed, so good treatment translates into good service.

This finding is consistent with Bastidas et al. (2025), which posits that when staff are satisfied, well-treated, and empathetic, they provide better service. It also aligns with the findings of Espinosa et al. (2022), who state that customer trust prevails over the system's efficiency and effectiveness, since, in practice, shops or businesses should not behave solely as transaction processors but should redefine service around social interaction.

Although the results focus on human treatment, other opposing theories prioritize automation and AI-based services, in which speed and efficiency drive satisfaction (Xu et al., 2020). However, beyond theories, it is important to recognize that, in contexts of financial

vulnerability, empathy serves as a central axis of credibility within the system. Therefore, staff quality is significant and directly influences financial inclusion.

Consequently, the functional quality dimension, comprising services, products, prices, and access, explains the model only moderately, implying that users may attribute functionality to other factors as fully explaining it. This is not a weakness of the construct; on the contrary, it reaffirms the multidimensional approach with staff and environment quality. For this reason, the model's results suggest that the convergence of dimensions explains inclusion. The literature confirms the result that quality is specified by functional attributes (Ozili, 2020) and, furthermore, service quality based on this dimension shows a significant positive association with inclusion, even more so in vulnerable sectors where non-banking correspondents are well placed to contribute to users' financial needs, arguments that are contrasted by the theory of Dua and Dua (2023).

The model's results show that financial inclusion is strongly associated with customer satisfaction, reflecting the relationship between the latent variables. However, its own dimensions also reveal a two-dimensional construct that comprehensively explains its relationship. Its main dimension is quality, comprising variety, regulation, supervision, and consumer protection, an approach that broadly underpins the trust perceived by the user. This is based on the finding that trust is driven by service satisfaction, so there is no satisfaction without trust, supporting Leninkumar's (2017) theory, which argues that greater satisfaction leads to greater trust and vice versa. These results show that the perception of quality, where consumer protection is paramount, is not a negotiable factor in inclusion. Therefore, this result points towards the development of policies that strengthen these indicators to generate satisfaction and, in turn, inclusion.

The dimension of use also has a strong, significant influence on satisfaction and inclusion, indicating that recurrence among non-banking correspondents embodies these approaches. Regularity makes the service a habit, which strongly supports user satisfaction, since a lack of regularity means no satisfaction with the service. In turn, personalization through product adaptation involves searching for tools that meet needs in line with reality, which is why correspondents were created under this premise: they can meet expectations precisely because of their ability to adapt.

This argument supports the theory of Okeke et al. (2024), who indicate that personalization increases satisfaction, trust, and financial inclusion. In this regard, it is important to continue developing strategies that reach users by prioritizing their needs, especially in contexts of vulnerability, given that the results suggest that correspondents are positively associated with financial inclusion. Therefore, an initial needs assessment will allow us to create new ways to personalize services and drive satisfaction.

Similarly, the access dimension connects the initial approach to needs with the actual interaction with the financial system. The results support a positive cognitive-behavioral attitude toward correspondent services, which translates into user satisfaction due to rapid, effective fulfillment of needs and the perception that the service is tailored to them. Although satisfaction with access is an explicit indicator, the set of indicators comprehensively explains satisfaction and, in turn, inclusion. This framework supports Bashir and Muhammad (2023) by proposing that a positive attitude toward the service is based on beliefs of usefulness, which, in turn, translate into an intention to use. For this reason, access perceived as easy and possible, as well as services considered useful, generate overall satisfaction.

The findings on use and access also align with recent studies on digital and alternative financial channels. Ryan and Mukherjee (2026) show that open banking can increase participation in digital payments, especially among less-educated adults, reinforcing the importance of designing channels that reduce barriers and facilitate effective use. Complementarily, El Amri et al. (2026) emphasize that users' experience improves when access, positive beliefs, and safety measures are present simultaneously. Therefore, the positive association observed between satisfaction and financial inclusion in this study may be interpreted as evidence that non-banking correspondents contribute to inclusion when they are perceived as accessible, useful, secure, and adapted to users' everyday financial needs. Finally, the results reveal that the financial inclusion enabled by non-banking correspondent services stems from user satisfaction. In this sense, correspondents should not be seen only as a business but as a strategic experiential achievement for inclusion.

CONCLUSION

The study presents an empirical model that reflects the determinants of customer satisfaction in financial inclusion. It also provides a compendium of indicators that can predict both latent variables as a whole. Therefore, this model provides a holistic, two-dimensional framework for understanding the relationship between inclusion and satisfaction in financial terms.

The findings show that inclusion is associated not only with financial infrastructure but also with a behavioral process of user perception, measured by satisfaction. The study's main contribution is that service quality, across its dimensions, bridges the gap to inclusion. Environmental quality was the most significant factor, considered the primary driver of trust. In turn, staff quality, as measured by a predominant indicator such as empathy, ensures that users have positive experiences with customer service and protection, and variety also showed that users have confidence in the system. Taken together, these dimensions generate

a process of financial adoption achieved mainly through user satisfaction, centered on psychological mechanisms that shape perceptions of financial behaviors.

The study's practical implications are that inclusion strategies should not be based solely on accessible points of service, which, although they have led to effective integration into the financial system, cannot be viewed in isolation. Therefore, it is necessary to develop an ecosystem of experiences that guarantees staff quality, environment, functional quality, access, product adaptation, and consumer protection, among other significant aspects that holistically integrate this ecosystem. Consequently, the contribution to finance is to generate alternative services that build significant user confidence, based on the previously established model, where perception is a key variable to consider when establishing services.

Future lines of research may include a longitudinal design to demonstrate the evolution of this relationship. However, the proposed model offers a valid and empirically proven alternative: non-banking correspondents are not only financial services providers but have also joined forces to advance financial inclusion through approaches based on trust and perceived security for users. Integrated into an ecosystem of experiences, this will generate a strategic framework for designing inclusive financial policies.

Informed consent statement

Informed consent for participation was obtained from respondents who participated in the survey. Before participation, all respondents received comprehensive information about the study's objectives, their rights as research participants (including the right to participate voluntarily and to withdraw at any time without penalty), and the parameters of informed consent. Rigorous confidentiality protocols were implemented throughout the study, including guarantees of complete anonymity, strict limitations on data usage for academic research purposes only, and explicit assurances that no participant information would be shared with third parties**.**

Declaration of generative AI

It is hereby stated that all statements, opinions, and data contained in this article are the sole responsibility of the authors. In particular, they declare that no artificial intelligence (AI) tools were used in the text, figures, tables, or any section of the article; therefore, the text is considered the authors' own work for intellectual property purposes. Consequently, they release the editors and the journal from any ethical or legal liability. DeepL was used to translate from Spanish to English, and Grammarly was used solely to improve the manuscript's readability and language

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Appendix

Table A1. Shapiro–Wilk W test for normal data

				Shapiro–Wilk W test			
Variable	Obs	Skewness	Kurtosis	W	V	z	Prob>z
v1	222	-0.499	2.832	0.984	2.602	2.212	0.013
v2	222	-0.386	2.317	0.990	1.594	1.078	0.140
v3	222	-0.530	2.500	0.982	2.961	2.51	0.006
v4	222	-0.386	2.293	0.988	1.981	1.581	0.057
v5	222	-0.227	2.421	0.994	0.954	-0.109	0.543
v6	222	-0.419	2.440	0.989	1.845	1.417	0.078
v7	222	-0.288	2.221	0.991	1.416	0.805	0.211
v8	222	-0.510	2.520	0.986	2.243	1.868	0.031
v9	222	-0.549	2.593	0.983	2.707	2.303	0.011
v10	222	-0.432	2.374	0.989	1.760	1.307	0.096
v11	222	-0.429	2.308	0.987	2.116	1.734	0.041
v12	222	-0.424	2.395	0.990	1.693	1.218	0.112
v13	222	-0.616	2.898	0.979	3.447	2.862	0.002
v14	222	-0.645	2.622	0.977	3.681	3.014	0.001
v15	222	-0.510	2.481	0.985	2.403	2.028	0.021
v16	222	-0.449	2.393	0.984	2.648	2.252	0.012
v17	222	-0.395	2.251	0.991	1.529	0.981	0.163
v18	222	-0.424	2.198	0.987	2.192	1.816	0.035
v19	222	-0.448	2.133	0.985	2.414	2.038	0.021
v20	222	-0.332	2.305	0.993	1.065	0.145	0.442

Note: Test for multivariate normality Doornik-Hansen chi2(4) = 23.950 Prob>chi2 = 0.0001
Source: Own elaboration.

Table A2. Structural model results with missing values

Path	Original sample	Sample mean	Standard deviation	T statistics	CI lower	CI upper
FI -> Access	0.804	0.804	0.026	30.853***	0.748	0.852
FI -> Quality	0.907	0.908	0.011	80.817***	0.884	0.928
FI -> Use	0.859	0.859	0.020	43.085***	0.815	0.894
CS -> Physical	0.806	0.806	0.023	35.179***	0.758	0.847
CS -> Functional	0.857	0.857	0.023	36.592***	0.806	0.896
CS -> Staff	0.827	0.827	0.019	44.325***	0.789	0.862
CS -> IF	**0.749**	**0.747**	**0.039**	**19.415***	0.664	0.816

Note: FI Financial inclusion, CS Costumer satisfaction; *** p<0.01; IF (R^2=0.560); SRMR=0.09
Source: own elaboration.

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From Employment to Entrepreneurship: Career Adaptation, Entrepreneurial Identity, and the Theory of Adaptive Career Shift

Del empleo al emprendimiento: adaptación profesional, identidad emprendedora y la teoría del cambio de carrera adaptativo

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ABSTRACT

The study explores the lived experiences of individuals who transitioned from employment to entrepreneurship in Southern Leyte, Philippines, and generates a theory rooted in the participants' narratives. To achieve this, the study combined two qualitative approaches: descriptive phenomenology as a methodological perspective and grounded theory as the data analysis technique. Through in-depth interviews with ten entrepreneurs across diverse sectors, four major themes emerged: Disruption Igniting New Path, Strategic Journey of Subtle Transition, Embracing Self-Direction and Control, and Harmony with Values and Inner Purpose. Findings reveal that while external crises, such as job loss and pandemic-related disruptions, acted as initial triggers, internal motivations, including autonomy, personal values, and purpose, significantly influenced participants' decisions. The research concluded with the Theory of Adaptive Career Shift, in which entrepreneurial transition is a dynamic process shaped by external disruptions and internal desires, resulting in personal and professional reinvention. This research contributes a human-centered perspective to career development literature, emphasizing entrepreneurship as both a practical and existential path to self-actualization.

Keywords: entrepreneurial transition; career adaptability; entrepreneurial identity; hybrid entrepreneurship; career transition.

JEL Code: L26; M13; J24; J62.

RESUMEN

El estudio explora las experiencias de personas que pasaron del empleo al emprendimiento en Leyte del Sur, Filipinas, y desarrolla una teoría a partir de las narrativas de los participantes. Para lograrlo, el estudio combinó dos enfoques cualitativos: la fenomenología descriptiva como perspectiva metodológica y la teoría fundamentada como técnica de análisis de datos. A través de entrevistas exhaustivas con diez emprendedores de diversos sectores, surgieron cuatro temas principales: la disrupción abre un nuevo camino, el viaje estratégico de la transición sutil, la adopción de la autodirección y el control, y la armonía con los valores y el propósito interior. Los hallazgos revelan que, si bien las crisis externas, como la pérdida de empleo y las disrupciones relacionadas con la pandemia, actuaron como detonantes iniciales, las motivaciones internas, como la autonomía, los valores personales y el propósito, influyeron de manera significativa en las decisiones de los participantes. La investigación concluyó con la Teoría del Cambio de Carrera Adaptativo, según la cual la transición emprendedora es un proceso no lineal, influido por disrupciones externas y deseos internos, que conduce a la reinvención personal y profesional. Esta investigación aporta una perspectiva centrada en el ser humano a la literatura sobre desarrollo profesional, enfatizando el emprendimiento como una vía práctica y existencial hacia la autorrealización.

Palabras clave: transición emprendedora; adaptabilidad profesional; identidad emprendedora; emprendimiento híbrido; transición profesional.

Código JEL: G210, M100.

INTRODUCTION

In recent years, more individuals have considered becoming entrepreneurs in response to changing industry requirements, work preferences, and technological advancements, or simply to increase household income. As such, some engage in entrepreneurial ventures while working—entrepreneurs often work for other organizations before starting entrepreneurial activity—while others leave their regular jobs to start their own businesses. The transition from employment to entrepreneurship is seen not only in cities but in rural areas as well. According to Barber et al. (2021), rural regions offer unique economic and structural opportunities for prospective entrepreneurs, including those who have left or plan to leave paid employment. The province of Southern Leyte in the Philippines is one rural area that has seen growth in entrepreneurial activities. In 2023, the province's economy grew by 7.3%, driven by growth in industries such as construction, agriculture, and wholesale and retail trade (Philippine Statistics Authority [PSA], 2024).

Although entrepreneurship offers potential benefits, the decision to transition from employee to full-time entrepreneur can significantly affect individuals' finances, careers, and personal well-being. Individuals who choose to embark on an entrepreneurial career enter an often solitary, 'sink or swim' environment laden with risk and uncertainty (Liguori et al., 2020). Because entrepreneurship is dynamic and uncertain, it is necessary to evaluate and understand entrepreneurial transition through the lens of individuals who have personally experienced the process.

Recent studies emphasized that entrepreneurial transition is not merely a change in occupation but a complex career process influenced by personal aspirations, identity development, and changing work conditions. As careers become increasingly dynamic and less linear, individuals are more likely to reassess traditional employment pathways and explore entrepreneurship as an alternative way to achieve professional growth, autonomy, and personal fulfillment (Marshall & Gigliotti, 2020; Fossen & Sorgner, 2021). This suggests that entrepreneurial transition should be understood not only as an economic decision but also as an important career development process.

Another area that has received growing attention is entrepreneurial identity. Existing research suggests that entrepreneurial identity aspirations, particularly when combined with significant work-related events, can influence individuals' decisions to pursue entrepreneurship (Seibert et al., 2021). Entrepreneurial transition extends beyond opportunity recognition and financial considerations, often involving self-discovery, personal reflection, and identity reconstruction. Such findings highlight the importance of examining

entrepreneurial transition through the lived experiences of those who have personally undergone the process (Murnieks et al., 2020).

Moreover, recent literature has also strengthened the understanding of hybrid entrepreneurship as a pathway toward full-time entrepreneurial engagement. While some individuals leave employment immediately to pursue entrepreneurial opportunities, others gradually transition by simultaneously maintaining employment while operating a business venture (Raffiee & Feng, 2014). This approach allows aspiring entrepreneurs to gain experience, test opportunities, and reduce financial risks before fully committing to entrepreneurship (Block & Landgraf, 2016a; Ferreira, 2020). These findings suggest that entrepreneurial transition may occur through different pathways and adaptive strategies rather than a single, uniform process.

While previous studies have identified the factors and motivations that may prompt an individual to shift from paid employment to entrepreneurship, scant literature has explored the lived experiences of individuals who have undergone the transition, especially in rural areas. While entrepreneurial transition has received growing scholarly attention, relatively fewer studies have examined the phenomenon within rural contexts. Existing research suggests that entrepreneurial experiences in rural settings may differ from those observed in urban environments due to variations in employment opportunities, economic structures, community networks, and access to entrepreneurial resources (Barber et al., 2021). Consequently, findings derived from rural contexts contribute important insights that may not be fully captured in studies conducted primarily in urban or highly industrialized settings.

Moreover, most studies to date have relied on large-scale numerical analyses through surveys, with little attention to narratives and lived experiences, indicating a methodological gap. The literature also offers few theories that describe the phenomenon of entrepreneurial transition.

This paper addressed these gaps by uncovering the experiences of those who have undergone the transition process and developing a new theoretical perspective grounded in participants' lived experiences. It contributes to the growing body of knowledge on entrepreneurial transition by providing a contextually grounded understanding of how individuals navigate the shift from traditional employment to entrepreneurship. The insights generated may inform educators, policymakers, entrepreneurship support institutions, and future researchers seeking to better understand and support entrepreneurial transition within similar contexts.

Atheoretical Stance

This study employs an atheoretical approach to investigating the experiences of individuals who transitioned from traditional employment to entrepreneurship. Rather than relying on

preconceived notions or established theoretical frameworks, this approach lets the data guide the discovery process. Three primary methodologies—open discovery, as it explored the phenomenon with no preconceived assumptions; data-driven strategy, as results are based on the lived experiences and viewpoints of the participants and evidence rather than preconceived notions; and inductive reasoning, as the study utilized gathered data and information to create new theories or models that offer novel insights into the field.

Philosophical Stance

This study explores the experiences of individuals in Southern Leyte, Philippines who have transitioned from traditional employment to entrepreneurship. It is anchored in constructivist epistemology, relativist ontology, axiology, and pragmatism. Taken as a whole, these components outline the fundamental beliefs and assumptions that guide the study strategy.

Domain of inquiry

The study explores and describes the lived experiences of individuals who have transitioned from traditional employment to entrepreneurship, and generates theoretical insights from these experiences that contribute to the field of entrepreneurship studies.

RESEARCH METHODOLOGY

Design

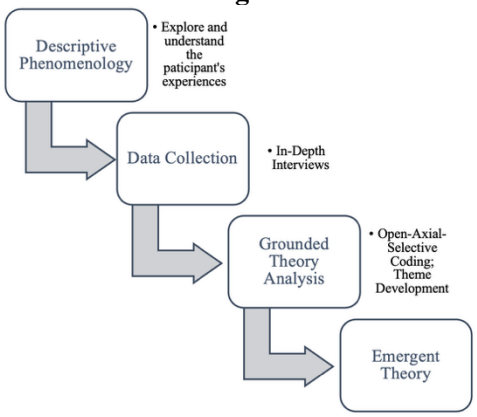
This study adopted a qualitative research design, utilizing a descriptive phenomenology approach. Descriptive phenomenology investigates the essence of how phenomena are consciously experienced (Giorgi, 2006). It is designed to explore and understand people's experiences of a particular phenomenon. Because this study aimed to explore the experiences of individuals who transitioned from traditional employment to entrepreneurship, this research design allowed the researcher to deeply understand respondents' journeys and the meanings they attached to the phenomenon they experienced.

Descriptive phenomenology serves as the overarching methodological orientation for accessing lived experience, while selected grounded-theory coding procedures are used as an analytical strategy for conceptual integration and theory generation. Thus, phenomenology guided the study in understanding and describing the meanings participants attached to their transition experiences, while grounded-theory procedures supported the systematic organization, comparison, and integration of these experiences into categories, themes, and an emergent theoretical explanation.

Figure 1 below illustrates the study design framework, beginning with a descriptive phenomenological understanding of participants' experiences, followed by data collection

and grounded-theory procedures for analysis and theory generation. The combined use of these approaches offered an extensive and well-founded investigation of the phenomenon.

Figure 1
Research Design Framework



Source: Own elaboration.

Environment

This study was conducted in the province of Southern Leyte, Philippines. Such a location was chosen based on the following criteria: (1) rural area; (2) developing economy; and (3) observed rise of entrepreneurship. By focusing on this location, the study captures the unique experiences of entrepreneurs in the rural setting, contributing to a more localized understanding of the entrepreneurial transition process. The face-to-face interviews were conducted in a place favored by the participants where they felt most comfortable sharing their experiences. Virtual interviews were conducted through Google Meet and MS Teams.

Key Informants and Sampling

A purposive sampling technique was used, as the study included only individuals who have transitioned from employees to full-time entrepreneurs. Purposive sampling was used because respondents must have direct experience relevant to the study's objectives. Participant selection was guided by the following Inclusion and Exclusion criteria.

Inclusion Criteria: (1) of legal age and residents of Southern Leyte; (2) currently operating their own business; (3) have at least 5 years of entrepreneurial experience after leaving traditional employment; (4) willing to participate and give informed consent; and (5) able to articulate their transition experience.

Exclusion Criteria: (1) below 18 years old and non-residents of Southern Leyte; (2) operating their own business but still working; (3) less than 5 years of entrepreneurial experience after leaving traditional employment; (4) unwilling to participate and give informed consent; and (5) unable to articulate their transition experience.

The study initially targeted 8-12 participants; however, saturation was achieved with the tenth participant. After interviewing the 10th participant, no new themes or insights emerged. This indicated that the data was sufficient to capture the phenomenon. The participants, who had left their jobs and managed their entrepreneurial ventures for five years or more, are in their 30s to late 40s. They formerly worked in different jobs across various industries, such as academia, engineering, architecture, nursing, hospitality, and IT.

Qualitative Data Analysis

This study used grounded theory procedures to analyze the data. Grounded theory is a systematic qualitative approach that generates theory inductively from empirical data (Glaser & Strauss, 1967). While the study adopted descriptive phenomenology to explore and describe the lived experiences of individuals who transitioned from employment to entrepreneurship, grounded theory procedures were used during the analytical phase to facilitate theme development and theory emergence.

The analysis began with repeated reading of the interview transcripts to gain a comprehensive understanding of the participants' experiences. Consistent with descriptive phenomenology, the researcher bracketed personal assumptions and biases to focus on the meanings participants conveyed (Giorgi, 2009). The analytical process subsequently followed grounded theory coding procedures to organize, interpret, and synthesize the data into meaningful categories and theoretical insights. The study likewise adhered to Lincoln and Guba's (1985) criteria of trustworthiness to ensure credibility, dependability, confirmability, and transferability. The study maintained an audit trail throughout to document the progression of the analysis from significant statements to formulated meanings, subthemes, themes, and theory development. A structured codebook and iterative theme refinement provided transparency in analytical decisions and facilitated traceability from raw data to the emergent theory.

Coding and Theory Development Process

The analysis followed a systematic coding process that supported theme development and theory generation. After transcription, the interview data were reviewed repeatedly to become familiar with the participants' narratives and gain a holistic understanding of their entrepreneurial transition experiences. Significant statements related to the phenomenon were identified and extracted from the transcripts.

During the open coding stage, significant statements were assigned formulated meanings that captured the essence of the participants' experiences. These formulated meanings served as the initial conceptual labels derived directly from the participants' narratives. Examples included forced exit due to job instability, entrepreneurial interest even before employment, autonomy and flexibility, and making a difference by helping others. The coding process

remained closely grounded in the participants' own accounts to preserve the meanings embedded in their experiences.

During axial coding, conceptually related formulated meanings were grouped into subthemes. This process allowed the researcher to identify recurring patterns and relationships across participants' experiences. Subthemes such as job loss and employment instability, freedom over time and decision-making, finding purpose through impact, and early entrepreneurial exposure or interest emerged during this stage. In the selective coding stage, related subthemes were integrated into broader thematic categories. The table 1 illustrates the coding process.

Table 1
Illustration of the Coding Process

Significant Statement	Formulated Meaning	Subtheme	Themes
"They started laying people off..."	Forced Exit due to Job Instability	Job Loss and Employment Instability	Disruption and Opportunity During the Pandemic
"There's no boss, no reports..."	Control Over Work Environment	Freedom over Time and Decision-Making	Increased Autonomy and Control
"I had a dream and a clear vision..."	Entrepreneurial Interest Even Before Work	Early Entrepreneurial Exposure or Interest	Alignment with Personal Values and Fulfillment
"You get to help others..."	Making a Difference by Helping Others	Finding Purpose Through Impact	Strategic Transition and Gradual Shift

Source: Own elaboration.

Through iterative comparison and abstraction, preliminary themes were refined to better capture the underlying entrepreneurial transition process reflected in the participants' narratives, as shown in Table 2. This process ultimately led to the final thematic structure and the emergence of the Theory of Adaptive Career Shift. The theory was generated inductively from the data and reflects the interconnected experiences, meanings, and adaptive responses described by the participants. Through iterative comparison and integration of the themes, the study identified broader theoretical elements to explain how entrepreneurial transition unfolds as a process.

Table 2
Refinement of Preliminary Themes into Final Themes

Preliminary Themes	Final Themes	Rationale for Refinement
Disruption and Opportunity During the Pandemic	Disruption Igniting New Path	Expanded beyond pandemic-specific experiences to capture broader forms of disruption and career redirection described by participants.
Increased Autonomy and Control	Embracing Self-Direction and Control	Better reflected participants' emphasis on empowerment, autonomy, and decision-making authority.
Alignment with Personal Values and Fulfillment	Harmony with Values and Inner Purpose	Captured the deeper meaning-making, purpose, and value alignment expressed in participants' narratives.
Strategic Transition and Gradual Shift	Strategic Journey of Subtle Transition	Emphasized the process-oriented and evolving nature of entrepreneurial transition.

Source: Developed from the study codebook and theme refinement process.

These theoretical elements synthesized the themes' underlying relationships into a coherent explanatory framework. Consequently, the Theory of Adaptive Career Shift emerged as an interpretation of how the themes interacted to shape the participants' transition from employment to entrepreneurship.

Ethical Consideration

This study strictly adhered to established ethical standards and guidelines to protect participants' rights and dignity. Ethical clearance was obtained from the institutional review board before the data collection commenced. Participation was voluntary, and participants signed the consent form before the interview process began. An orientation session was conducted to demonstrate the study's purpose, risks, benefits, interview guidelines, and other relevant information to the participants. To maintain confidentiality, participants were assigned unique identification numbers, and any identifying information such as names and addresses was omitted from transcripts. Interview data, including recordings, were securely stored on a password-protected device to prevent unauthorized access. All recordings were permanently deleted and destroyed after data/thematic analysis. In addition, the researcher practiced reflexivity to avoid personal biases throughout the study.

RESULTS AND DISCUSSION

This study explored the lived experiences of individuals transitioning from employment to entrepreneurship. Analysis of the interview data revealed four overarching themes, each capturing the participant's transition journey. Each theme was developed through subthemes highlighting specific motivations, supported by participants' verbatim accounts.

Theme 1: Disruption Igniting New Path

The first central theme of this study reveals that, despite being a disruptive force, the COVID-19 pandemic catalyzed career transformation. Initially, participants turned to entrepreneurship out of necessity, as some faced job loss and instability due to the lockdowns. However, the lockdowns also gave them the time and space to recast their career aspirations and discover something more profound and meaningful.

These findings corroborate recent research. Donthu and Gustafsson (2020) noted that the pandemic brought not only disruption but also innovation, particularly in the way people work, consume, and engage in business. They emphasized that many people, faced with economic instability, turned to entrepreneurship to adapt and survive. Similarly, Kuckertz et al. (2020) stated that crises also tend to trigger this kind of entrepreneurial thinking, forcing entrepreneurs to reassess their risks, priorities, and long-term goals. The first theme is broken down into three sub-themes.

Sub-theme 1.1: Job Loss and Employment Instability

Others experienced job loss or work-related challenges and risks during the pandemic. Some participants had a tough time traveling for work during the lockdowns because of restrictions. These trials forced them to become entrepreneurs as a secondary livelihood, so they could earn even from home. Participant 1 expressed:

"If not for the pandemic, I would have stayed. They started laying people off… That is when I decided to go full-time as an entrepreneur."

This subtheme shows that the pandemic's abrupt economic crisis reorganized many people's lives by producing mass unemployment and insecurity. But for most, losing the security of a fixed income or missing out on hefty race contracts forced them to reconsider and rethink their career path. In this case, becoming an entrepreneur wasn't something these participants had planned; rather, it was a move born out of necessity. Their stories show that while the disruption was tough, it also created space — even if unplanned — for new beginnings and self-employment opportunities.

Sub-theme 1.2: Reallocation of Time and Priorities

The restrictions during the pandemic allowed participants more time at home, which they used to explore income-generating hobbies and small-scale businesses. Participant 3 shared:

"Since going abroad didn't push through and I wanted to spend more time with my family, I started the business… I believe it was a blessing from God."

The extended lockdowns and work stoppages gave participants the time to reflect, something that they rarely had before as employees. Since traveling and other usual recreational or social activities were restricted, many found themselves reconnecting with family, focusing on self-care, or diving into hobbies that had long been set aside. This sub-theme shows how that unanticipated extra time became a crucial moment that sparked self-assessment, creativity, and the pursuit of endeavors that felt more personally satisfying.

Sub-theme 1.3: The Pandemic as a Catalyst for Reflection

Participants reassessed their professional priorities because the pandemic forced a pause, prompting them to reconsider their life goals and career pathways. Participant 6 conveyed:

"Eventually, I realized I needed to focus on the business… I knew I had to choose what I wanted in life."

For the participants, the pandemic was not just an interruption. It was a pause so rare it sparked intense personal reflection. Away from daily routines and suddenly living at a slower pace, many had room to think about what actually mattered to them — among other things, their job satisfaction, personal goals, and well-being. Others found out that the work they had

been doing didn't match their values or ambitions. This pushed them to pursue things that felt more meaningful.

Theme 2: Strategic Journey of Subtle Transition

While it was argued at the beginning that individual participants were sometimes forced into opportunities by external triggers, the second theme suggests that entrepreneurial transition is often organized and multistage. It's not always crisis-driven but often a result of foresight, planning ahead, and life falling into place. Several participants explained how they "transitioned incrementally," focusing on their side business while they still worked, so they could minimize risk and prepare for the leap to full-time. This suggests a deliberate and considered form of entrepreneurship.

Some studies support this perspective. Block and Landgraf (2016b) note that "hybrid entrepreneurs" — those who start a business while still employed — benefit from valuable learning experiences and reduced risks, leading to smoother transitions. Similarly, Chlosta et al. (2012) highlight that entrepreneurship often forms part of a broader life strategy, one that takes into account timing, family responsibilities, and long-term security.

Sub-theme 2.1: Early Entrepreneurial Exposure or Interest

Some participants had an entrepreneurial inclination even while employed, seeing business as a long-term goal. Participant 2 shared:

"I had a dream and a clear vision. I knew I wasn't meant to work abroad or for someone else. … I'd rather do business."

This sub-theme captures the participants' inclination and aspiration to have their own business even before they started their respective jobs. They carried this entrepreneurial inclination even while working, hoping for the perfect timing to pursue their dream business ventures. Their stories reflect a strong internal pull toward business, not as a backup plan, but as something they had always envisioned for themselves.

Sub-theme 2.2: Hybrid or Parallel Setup before Transition

Before leaving employment entirely, many ran their businesses part-time, minimizing financial risk while building experience. Participant 8 mentioned:

"Since I was doing business while working, I didn't prepare for the transition… shifting to full-time business was easier."

This sub-theme suggests that many participants transitioned through a hybrid entrepreneurship model, managing their business alongside their jobs. Though it was difficult, especially in terms of time management, this approach provided a safety net, enabling them to manage financial obligations while gradually learning business operations.

It also enabled them to test the market, refine their offerings, and gain confidence without the immediate pressures of full-time entrepreneurship.

Sub-theme 2.3: Realization through Life Events or Milestones

Life events and milestones, such as family responsibilities and successful endeavors, were turning points in subtly pursuing entrepreneurship, as Participants 7 and 8 narrated:

"I did not leave the job immediately. I stepped away for personal reasons—specifically when I got pregnant with my first child."

"Eventually, I decided to leave when my events business started taking off, especially with bigger national and international projects…so I focused on the business."

For some participants, significant life events acted as catalysts for entrepreneurial transition. Participants perceived these moments as creating a sense of urgency or prompting a reevaluation of life goals, leading to a move toward full-time entrepreneurship. The shift was not necessarily planned in these cases, but the timing felt appropriate due to changes in personal priorities or circumstances.

Theme 3: Embracing Self-Direction and Control

The third theme of the study reveals how entrepreneurship gave participants not just monetary rewards, but also empowerment. It was not just about earning money, but about being in charge of their time, decisions, and boundaries. Many expressed having the gift of living more intentionally because of this newfound independence.

Stephan (2018) points out that entrepreneurship is likely associated with higher subjective well-being because it provides more control, more purposeful work, and better work-life reconciliation. Similarly, another study by Shir et al. (2019a) confirmed the extent to which autonomy and control over money can substantially improve psychological well-being and life satisfaction in entrepreneurs. This theme is likewise broken down into three sub-themes.

Sub-theme 3.1: Freedom over Time and Decision-Making

Respondents appreciated being their own boss for the freedom and independence it gave them to implement ideas without external limitations, as expressed by Participant 5:

"There is no boss, no reports, no fixed deadlines… That is the freedom I have now."

This sub-theme suggests that, unlike more typical employment that might entail a set schedule and a hierarchy of decision-making, owning a business gave them the freedom to manage their time and make decisions. With the flexibility to shape their workday, their work environment increased their sense of ownership, job satisfaction, and productivity.

Sub-theme 3.2: Income Control and Financial Independence

Having a business allowed participants to set their earnings, unlike paid work with fixed rates of pay. Participant 1 explained:

"Being an entrepreneur feels very different — and much better… You also get to control your income, and that feels empowering."

This sub-theme explains that another significant shift participants experienced was control over income. Unlike being an employee, wherein they earn a fixed income, having their own business allowed them to earn based on their effort, strategy, and performance, thus removing income limitations. Though they acknowledged the unpredictability of earnings, the potential for higher income and financial freedom outweighed the risks. This highlights how entrepreneurship served not only as a financial alternative but as a path to empowerment and self-reliance.

Sub-theme 3.3: Better Work-Life Balance

Entrepreneurship enabled participants to balance their professional and personal lives better, contributing to overall well-being, as reflected in Participant 8's statement:

"As an entrepreneur, you have more time for yourself, your family, and your friends. That kind of work-life balance is something I truly value and would not trade."

Participants' stories revealed that one of the most important benefits of not being employed by anyone was the capacity to be more balanced in work and in life. Entrepreneurship was the entryway to that flexibility to build work around not only their families, but on their own terms and even in their leisure time. This independence was not simply about time; it was also about retaking control of their lives.

Theme 4: Harmony with Values and Inner Purpose

This fourth and final theme emphasizes that transitioning from a job to being your own boss was more than a career change; it was a deeply personal quest driven by value alignment. This alignment provided a degree of meaning that many had lacked in their professional lives. For them, entrepreneurship is not just about getting rich. It's more about doing something that you love that can make an impact on others and on yourself.

Recent literature supports this idea. Shepherd and Patzelt (2018) label it "meaningful entrepreneurship"—the type of business venture that truly expresses one's values and identity. Today's entrepreneur is increasingly conceptualized as a purpose-driven individual, seeking to align their work with what meaningfully matters to them (Cardon et al., 2020). Additionally, scholars such as Fatoki (2020) highlight the significance of internal readiness in relation to the entrepreneurial process.

Sub-theme 4.1: Pursuit of Passion and Self-Fulfillment

Participants pointed to the joy and genuine, passionate motivation of working in jobs they loved, a characteristic absent from more traditional jobs. Participant 10 revealed:

"I'm much happier now… It's harder because all the responsibility is on me, but the fulfillment and growth make it worth it.

Participants described becoming an entrepreneur as, for many, the first value-creating work they would really enjoy—work that aligned with their skills, passions, and personal interests. This emotional connection made all the difference. It was a difference that felt like all the difference in the world - emotional connection. Their businesses were not just economic endeavors, but sources of pleasure, pride and personal expression.

Sub-theme 4.2: Finding Purpose through Impact

Some mentioned that their enterprises allowed them to do good in their community or in other people's lives, making them feel like they're contributing to something greater than themselves. Participant 3 disclosed:

"In business, the impact is much deeper. You get to help others. You create jobs… that is what changed my perspective… knowing I can make a difference in their lives."

This sub-theme shows that, for some, entering entrepreneurship became more than a personal affair; it became a chance to contribute to society at large. As these individuals developed as entrepreneurs, their perspectives broadened. They provided jobs, met the needs of their surrounding communities, and served as symbols of achievable success. They found tremendous satisfaction in making a difference in their own communities.

Sub-theme 4.3: Faith, Mindset, and Internal Readiness

Participants spoke of the inner transformation needed to leap—developing faith, mindset, and self-belief. Participant 2 highlighted:

"The transition was not easy… Life was not easy, but I always believed that if you are willing, you can earn."

Participants emphasized the inner transformation required to embrace entrepreneurship. It involved more than just business planning—it was a test of resilience, faith, and mental preparedness. They pointed to the importance of spiritual grounding, positive thinking, and determination in facing uncertainties. This mindset shift enabled them to navigate risks and setbacks with confidence. In this context, entrepreneurship became as much a spiritual and personal growth journey as a professional one, highlighting the power of internal resources in driving external success. Table 3 below summarizes the four overarching themes (Disruption Igniting New Path, Strategic Journey of Subtle Transition, Embracing Self-

Direction and Control, Harmony with Values and Inner Purpose) capturing the nuanced experiences of individuals transitioning from traditional employment to entrepreneurship.

Table 3
Summary of Themes and Sub-themes

Theme	Subthemes	Description
Theme 1. Disruption Igniting New Path	Subtheme 1.1: Job Loss and Employment Instability	Job displacements and unstable work situations
	Subtheme 1.2: Reallocation of Time and Priorities	Shift in focus to family, health, and self.
	Subtheme 1.3: The Pandemic as a Catalyst for Reflection	Triggered personal and career reflection
Theme 2. Strategic Journey of Subtle Transition	Subtheme 2.1: Early Entrepreneurial Exposure or Interest	Sparked interest in business early in life or career
	Subtheme 2.2: Hybrid or Parallel Setup before Transition	Started a business while still employed
	Subtheme 2.3: Realization through Life Events or Milestones	Shift inspired by personal events or significant changes
Theme 3. Embracing Self-Direction and Control	Subtheme 3.1: Freedom over Time and Decision-making	Having control over one's time and choices
	Subtheme 3.2: Income Control and Financial Independence	Managing earnings and becoming self-reliant
	Subtheme 3.3: Better Work-Life Balance	Achieving a healthier mix of work and personal life
Theme 4. Harmony with Values and Inner Purpose	Subtheme 4.1: Pursuit of Passion and Self-Fulfillment	Engaging in work that aligns with personal interests and brings joy
	Subtheme 4.2: Finding Purpose through Impact	Feeling fulfilled by making a difference in others' lives
	Subtheme 4.3: Faith, Mindset, and Internal Readiness	Drawing strength from faith and a positive mindset to embrace change

Source: Own elaboration.

The findings of the present study share similarities with entrepreneurial transition research conducted in other settings. Studies in South Africa (Rugpath & Mamabolo, 2022), Europe (de Klerk et al., 2025), and the United States (Seibert et al., 2021) likewise emphasize the roles of career disruption, identity development, adaptability, and gradual entrepreneurial engagement. While contextual conditions differ, these parallels suggest that some aspects of entrepreneurial transition may transcend specific geographical settings.

Moreover, these findings suggest that entrepreneurial transition is shaped not only by individual motivations but also by the broader social, economic, and institutional contexts in which it occurs. Recent rural entrepreneurship research likewise suggests that local ecosystems, institutional conditions, and community resources often shape entrepreneurial opportunities and transition experiences (Candelario et al., 2024). Participants in this study were situated in a rural Philippine setting where employment opportunities, community networks, family responsibilities, and local economic conditions may have influenced how they experienced and navigated the transition from employment to entrepreneurship. Consistent with previous research, entrepreneurial transition does not occur in isolation; contextual factors may facilitate or constrain entrepreneurial action (Marshall & Gigliotti,

2020; Stephan, 2018). Consequently, the pathways described by the participants should be understood within the setting in which they emerged.

While similar patterns have been reported in studies of entrepreneurial transition, the present findings do not suggest that all transitions follow identical pathways. Rather, entrepreneurial transition is a dynamic process that may vary across geographical, cultural, and economic contexts. Therefore, the themes identified in this study should be viewed as contextually grounded insights that contribute to understanding entrepreneurial transition and provide a basis for future research in other settings (Lincoln & Guba, 1985). Although the findings are contextually situated, their value lies in providing theoretical insights into how participants experienced and interpreted entrepreneurial transition, which may be transferable to contexts with similar social and economic conditions.

Emergent Theory: The Theory of Adaptive Career Shift

The four themes identified in the study served as the empirical foundation for theory development. Through theoretical integration and abstraction, the study identified broader theoretical elements to explain how entrepreneurial transition unfolds as a process. These elements represent the underlying mechanisms that connect participants' experiences and collectively explain the movement from traditional employment to entrepreneurship. Thus, the Theory of Adaptive Career Shift emerged as a process-oriented explanation grounded in the relationships among the themes.

"The Theory of Adaptive Career Shift posits that the transition from conventional employment to entrepreneurship emerges from external disruption and internal drive, culminating in a profound personal and professional reinvention."

Rooted in individuals' real-life experiences and narratives, and based on emerging themes and sub-themes, this theory argues that entrepreneurial transitions are not merely responses to external, unexpected disruptions but also life-reinventing decisions shaped by changing priorities, personal aspirations, and adaptive strategies.

Four Interrelated Elements of the Theory of Adaptive Career Shift

1. Disruption as the Initial Spark

The process starts with an unexpected external event or disruption that affects an individual's employment stability. Consistent with the findings, disruption functioned as the triggering condition that prompted participants to reassess existing career trajectories and consider entrepreneurship as an alternative pathway. Rather than viewing uncertainty and instability as barriers, participants described entrepreneurship as a viable alternative career path through which they could respond to changing circumstances. As Donthu and Gustafsson (2020) and

Kuckertz et al. (2020) explain, people often become more innovative, flexible, and resilient in times of crises, often resulting in increased entrepreneurial activities.

2. Pull of Autonomy and Self-Governance

The desire and drive for self-governance grow stronger after the initial disruption. Individuals begin to want control over their environment, time, and the decisions they make. Walking away from work, all at once, is not simply a matter of leaving a job. Instead, it is about reclaiming one's person and life rhythm. This desire aligns with research from Stephan (2018), who found that entrepreneurial autonomy enhances overall well-being, and Shir et al. (2019b), who link it to psychological empowerment and increased motivation.

3. Strategic Entry through Gradual Transition

The third element reflects a measured, planned, and strategic approach to entrepreneurial transition. Many have started and managed their business while still working. They build their businesses while their jobs pay their bills. This hybrid setup allowed them to experience and learn the intricacies of business before fully committing, reducing risk and uncertainty before the full-time transition. This approach supports Block and Landgraf's (2016b) concept of hybrid entrepreneurship and Chlosta et al.'s (2012) emphasis on proper planning and early entrepreneurial exposure before leaving a job permanently to fully engage in business.

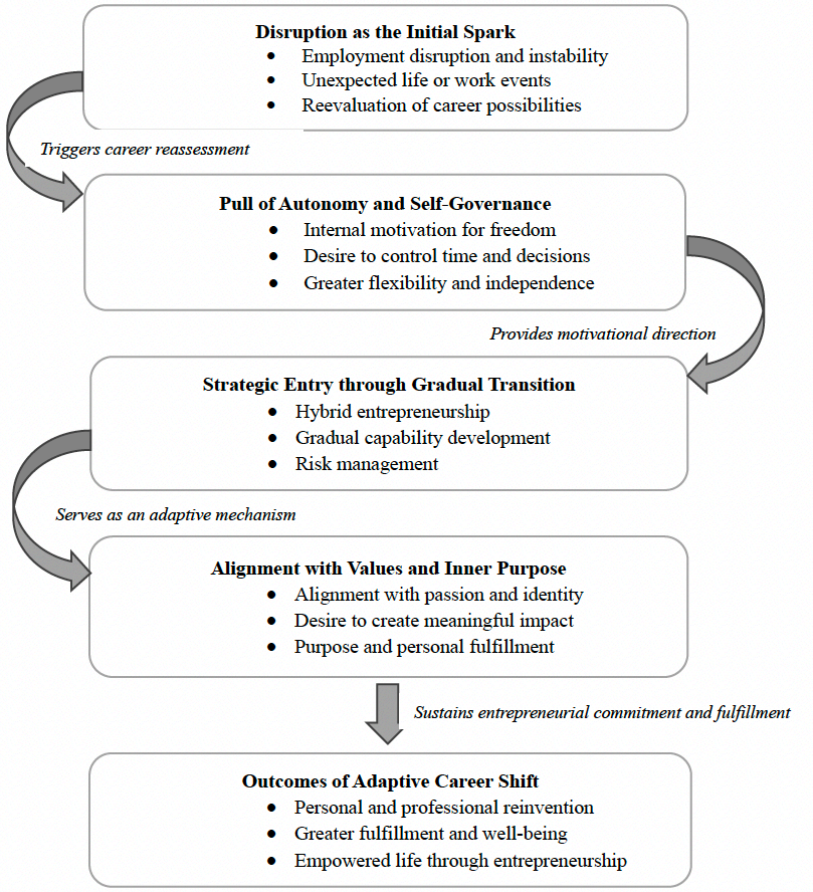
4. Alignment with Values and Inner Purpose

Once individuals begin their entrepreneurial journey, they often realize their business aligns with their identity, passion, and deeply held values. This contributes to a greater sense of fulfillment and purpose. At this point, entrepreneurship is not just a job but a calling—a meaningful endeavor that enhances personal and professional well-being, sense of purpose, and one's significance and contribution to society. This reflects the concept of purpose-driven entrepreneurship described by Shepherd and Patzelt (2018), and the importance of self-concept in business noted by Cardon et al. (2020).

Theoretical Integration of the Four Elements

As illustrated in Figure 2, the four elements of the Theory of Adaptive Career Shift represent interconnected processes that collectively explain how entrepreneurial transition unfolds. The theory suggests that external disruptions often create conditions that prompt individuals to reassess their existing career paths and future possibilities. As individuals reflect on these changing circumstances, a growing desire for autonomy and self-governance emerges, motivating them to seek greater control over their work and personal lives.

Figure 2
Schematic Diagram of the Theory of Adaptive Career Shift



Source: Own elaboration

Rather than immediately abandoning traditional employment, individuals often adopt gradual, strategic approaches that let them explore entrepreneurial opportunities while managing uncertainty and risk. Through this adaptive transition process, individuals increasingly align their entrepreneurial activities with their personal values, aspirations, and sense of purpose. In this process, disruption creates the need for reassessment, autonomy provides motivational direction, gradual transition serves as the adaptive mechanism for managing uncertainty, and value alignment reinforces long-term commitment to entrepreneurship. The interaction of these elements ultimately results in personal and professional reinvention, wherein entrepreneurship becomes not merely an alternative source of income but a meaningful expression of identity, purpose, and self-direction.

Theoretical Contribution and Positioning of the Theory of Adaptive Career Shift

The Theory of Adaptive Career Shift emerged from the lived experiences of individuals who transitioned from traditional employment to entrepreneurship. Although it shares ideas with existing career and entrepreneurship perspectives, it offers a distinct explanation of

entrepreneurial transition as an adaptive, evolving process. The theory brings together external disruption, the desire for autonomy, gradual entry into entrepreneurship, and alignment with personal values to explain how the transition may culminate in personal and professional reinvention.

The Theory of Planned Behavior explains entrepreneurial action mainly through intentions shaped by attitudes, subjective norms, and perceived behavioral control (Ajzen, 1991). This perspective remains useful in explaining planned entrepreneurial decisions. However, participants' experiences suggest that entrepreneurial transition is not always the outcome of a previously formed intention. It may also develop when unexpected work or life circumstances cause individuals to reassess their careers. Recent research likewise describes the movement from employment to entrepreneurship as a significant career transition involving barriers, adjustments, the use of career and social capital, and changes in career identity rather than a single decision to establish a business (de Klerk et al., 2025).

The findings also relate to the entrepreneurial identity perspective. Seibert et al. (2021) explained how entrepreneurial identity aspirations may interact with displacing work events in encouraging entrepreneurial entry. More recent longitudinal evidence indicates that entrepreneurial identity aspirations may persist over time and develop through entrepreneurial experiences (Belchior & Castro, 2023). Other recent research has shown that entrepreneurial identity is also shaped by the social and cultural contexts in which entrepreneurs construct and negotiate who they are (Ozasir et al., 2023). The Theory of Adaptive Career Shift extends this discussion by explaining how identity-related aspirations may become connected with disruption, autonomy seeking, gradual transition, and value alignment throughout the movement from employment to entrepreneurship.

The gradual pathway identified in the study is consistent with the hybrid entrepreneurship perspective. Existing research explains hybrid entrepreneurship as the simultaneous management of paid employment and entrepreneurial activity, which can reduce uncertainty while individuals test opportunities and prepare for full-time entrepreneurship (Raffiee & Feng, 2014; Block & Landgraf, 2016b; Ferreira, 2020).

Rugpath and Mamabolo (2022) further found that the hybrid phase serves as a learning ground in which entrepreneurs develop meaning, purpose, competencies, and self-leadership as they move toward full-time entrepreneurship. Their findings also recognize that this transition is not necessarily linear. The Theory of Adaptive Career Shift supports these insights but extends beyond the transition strategy itself by explaining how the gradual pathway interacts with external circumstances and deeper personal motivations.

Recent scholarship further supports the view of entrepreneurial transition as a gradual and evolving process. Cestino et al. (2026), in their study of hybrid founder entrepreneurs, identified transition capacity as an important process through which individuals develop the knowledge, competencies, and self-efficacy needed to consider movement toward full-time entrepreneurship. This finding complements the present study's identification of gradual transition as a strategic mechanism for managing uncertainty before full entrepreneurial commitment. Similarly, Bousfiha and Berglund (2025) found that entrepreneurial identity may develop through repeated micro-transitions between professional roles, suggesting that entrepreneurial identity is shaped through ongoing experiences rather than a single decisive career change. These findings reinforce the present study's interpretation of entrepreneurial transition as an evolving process involving both behavioral movement and identity-related change.

The theory likewise relates to career adaptability, which concerns how individuals prepare for and respond to changing career conditions. Career adaptability perspectives emphasize the personal resources used to manage career tasks, transitions, and disruptions. Recent career research, however, cautions against viewing adaptability and resilience only as individual qualities because careers are also influenced by social, economic, political, and educational systems (McMahon & Abkhezr, 2025).

The present theory reflects this interaction by recognizing that entrepreneurial transition is shaped by both personal agency and the conditions surrounding the individual. This is particularly important because the participants operated within a rural setting where networks, infrastructure, institutions, markets, and local economic resources may affect entrepreneurial opportunities. Recent rural entrepreneurship research similarly identifies both actor-related and environmental components as important parts of rural entrepreneurial ecosystems (Asmit et al., 2024).

Recent evidence from a low-income context further indicates that economic insecurity can shape engagement in hybrid entrepreneurship, with side-hustle activity functioning as a potential means of buffering economic vulnerability (Shahriar et al., 2026). This finding complements the present study's observation that employment instability and changing economic circumstances can influence how individuals navigate entrepreneurial transition.

The findings also resonate with broader career transition perspectives such as Career Construction Theory (Savickas, 2013), which views careers as actively constructed through meaning-making and adaptation, and Protean Career Theory (Hall, 2004), which emphasizes self-directed and values-driven career choices. The participants' experiences reflected elements of both perspectives, particularly in their efforts to redefine career success according to personal values and life goals. However, the Theory of Adaptive Career Shift

extends these perspectives by explaining how entrepreneurial transition may emerge from the interaction of external disruption, adaptive responses, and entrepreneurial engagement.

The Theory of Adaptive Career Shift, therefore, does not seek to replace existing perspectives. Instead, it complements and extends them by providing a process-oriented explanation that connects circumstances, motivations, transition strategies, and personal meaning. Recent scholarship has also described entrepreneurship as potentially involving career, personal, and existential transformation rather than only business formation (Oluwafemi & Duff, 2024).

Table 4
Comparison of the Theory of Adaptive Career Shift with Selected Theories and Perspectives Related to Entrepreneurial Transition

Theory or perspective	Primary focus	Explanation of entrepreneurial transition	Distinct contribution of the Theory of Adaptive Career Shift
Theory of Planned Behavior (Ajzen, 1991)	Intentions shaped by attitudes, subjective norms, and perceived behavioral control	Individuals pursue entrepreneurship when they develop the intention and perceive the behavior as desirable and feasible.	Explains how entrepreneurial transition may arise from the interaction of external circumstances and internal motivations, even when entrepreneurship was not originally intended as an immediate career choice.
Entrepreneurial Identity Perspective (Seibert et al., 2021; Belchior & Castro-Silva, 2023)	Entrepreneurial identity aspirations, self-concept, and entrepreneurial experience	Individuals may move toward entrepreneurship when the entrepreneurial role becomes consistent with who they wish to become; identity may also develop through experience.	Connects identity and value alignment with disruptive experiences, autonomy seeking, adaptive decision-making, and the transition from employment to full-time entrepreneurship.
Hybrid Entrepreneurship Perspective (Raffiee & Feng, 2014; Block & Landgraf, 2016b; Ferreira, 2020; Rugpath & Mamabolo, 2022)	Simultaneous engagement in employment and entrepreneurial activity	Individuals retain paid employment while testing the business, developing competencies, learning, and reducing the risks of full-time entry.	Explains gradual transition as one element within a broader adaptive process shaped by disruption, autonomy, changing priorities, and alignment with values and purpose.
Career Adaptability Perspective (Savickas, 2013; McMahon & Abkhezr, 2025)	Resources and responses used to manage career change, uncertainty, and career-related tasks	Individuals adjust goals, strategies, and behavior to respond to changing work and career conditions.	Shows how adaptive responses to career disruption may develop into entrepreneurial transition through autonomy seeking, strategic experimentation, and value-driven commitment.
Theory of Adaptive Career Shift (present study)	Entrepreneurial transition as a nonlinear and contextually influenced adaptive process	Transition develops through the interaction of external disruption and internal drive, expressed through autonomy seeking, gradual or strategic entry, and alignment with values and purpose, culminating in personal and professional reinvention.	Integrates environmental, psychological, strategic, and meaning-related dimensions into a unified, process-oriented explanation grounded in participants' lived experiences.

Source: Own elaboration.

Recent research on entrepreneurial identity and professional transitions likewise emphasizes that entrepreneurial identity may evolve through repeated role transitions and practical experiences rather than through a single career decision (Bousfiha & Berglund, 2025), further supporting the process-oriented character of the Theory of Adaptive Career Shift. Nevertheless, because the theory was developed from a specific rural Philippine context, it should be viewed as a contextually grounded theoretical explanation whose relevance and transferability require further examination in other geographical, cultural, and economic settings (Table 4).

CONCLUSION

Drawing on the lived experiences of individuals who transitioned from traditional employment to entrepreneurship, this study suggests that entrepreneurial transition is a dynamic and adaptive process shaped by the interaction of external circumstances and internal motivations. The Theory of Adaptive Career Shift explains how disruption, autonomy seeking, gradual transition strategies, and alignment with personal values may collectively influence the movement from employment to entrepreneurship. The findings further suggest that entrepreneurial transition extends beyond occupational change and may involve broader processes of personal and professional reinvention. By providing a contextually grounded explanation of entrepreneurial transition, the study contributes to the growing body of literature on entrepreneurship, career development, and career change.

Practical Implications

The findings may provide insights for entrepreneurship educators, career counselors, and entrepreneurship support institutions seeking to better understand the experiences associated with entrepreneurial transition. The participants' narratives suggest that entrepreneurship may serve as a meaningful career pathway for individuals seeking greater autonomy, flexibility, and alignment with personal goals and values.

The study also highlights the potential relevance of gradual or hybrid transition strategies, wherein individuals explore entrepreneurial opportunities while maintaining employment. In contexts similar to those represented in this study, these insights may inform entrepreneurship education, mentoring initiatives, and entrepreneurial support programs that help aspiring entrepreneurs navigate the uncertainties of career transition.

Theoretical Implications

The study contributes to the entrepreneurship and career transition literature by generating the Theory of Adaptive Career Shift, a process-oriented explanation of entrepreneurial

transition grounded in lived experience. Rather than viewing entrepreneurial transition solely as the outcome of intentions, identity aspirations, or strategic career decisions, the theory highlights how external disruptions, autonomy seeking, gradual transition strategies, and value alignment may interact throughout the transition process.

The theory does not seek to replace existing perspectives such as the Theory of Planned Behavior (Ajzen, 1991), entrepreneurial identity perspectives (Seibert et al., 2021), hybrid entrepreneurship perspectives (Raffiee & Feng, 2014; Block & Landgraf, 2016b; Ferreira, 2020), or career adaptability perspectives (Savickas, 2013). Instead, it complements these perspectives by providing a contextually grounded, process-oriented explanation of how entrepreneurial transition may unfold within individuals' lived experiences. The theory therefore offers a foundation for future research seeking to further examine, refine, or extend understanding of entrepreneurial transition across different contexts.

Limitations and directions for future research

The findings of this study should be interpreted within the context in which they were generated. Participants were drawn from a specific rural setting in Southern Leyte, Philippines, and their experiences were shaped by the social, economic, cultural, and institutional conditions present in that environment. Consequently, the Theory of Adaptive Career Shift should be viewed as a contextually grounded theoretical interpretation derived from participants' lived experiences.

While the theory provides insights into how entrepreneurial transition may unfold through the interaction of disruption, autonomy seeking, gradual transition, and value alignment, other factors not extensively explored in this study may likewise influence entrepreneurial transition. These may include industry characteristics, access to capital, government support mechanisms, entrepreneurial ecosystems, educational background, family dynamics, and broader economic conditions. Future studies may therefore examine how these factors interact with the processes identified in the present study.

Furthermore, the study focused on individuals who successfully transitioned from employment to entrepreneurship. Future research may explore the experiences of individuals who attempted but did not complete the transition, those who returned to employment after entrepreneurial engagement, or entrepreneurs operating in different geographical, cultural, and economic contexts. Such investigations may help refine, extend, or challenge the Theory of Adaptive Career Shift and contribute to a broader understanding of entrepreneurial transition.

Consistent with the principles of qualitative inquiry, the purpose of the study was not statistical generalization but the development of theoretical insights grounded in lived

experience (Lincoln & Guba, 1985). Future qualitative and quantitative studies may further examine the theory's transferability and applicability across diverse contexts and populations.

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