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DAFTAR ISI:

ANTESEDEN DARI NIAT PEMBELIAN PADA GENERASI Z DI INDONESIA

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Abstract: *This study aims to analyze the impact of social media influencer endorsements on TikTok on the purchase intentions of Generation Z in Indonesia, with brand awareness and perceived value serving as organism variables. The research is grounded in the Stimulus-Organism-Response (SOR) theory, wherein influencer endorsements act as the stimulus, brand awareness and perceived value function as the organism, and purchase intention represents the response. Primary data were collected via questionnaires from 267 respondents—Generation Z individuals who actively use TikTok and have been exposed to endorsement content—using a purposive sampling technique. The data were analyzed using Structural Equation Modeling (SEM) via the AMOS program. The results indicate that social media influencer endorsements do not have a direct effect on purchase intention; the findings suggest that such endorsements are insufficient to drive purchase intention directly without mediating or moderating variables, such as brand trust or brand attitude. This study contributes theoretically to the development of SOR theory within the context of digital marketing and offers practical implications for marketing managers in designing more effective influencer marketing strategies.*

Keywords: *Brand Awareness, Generasi Z, Perceived Value, Purchase Intention, Social Media Influencer Endorsement, Tiktok*

PENDAHULUAN

Dalam era digital yang semakin berkembang, media sosial tidak lagi sekedar alat komunikasi, melainkan telah menjadi wadah komunikasi pemasaran dan interaksi konsumen dengan merek. Kemajuan teknologi dan tingginya tingkat penggunaan internet membuat masyarakat, terutama generasi muda, semakin aktif menggunakan berbagai platform media sosial, salah satunya TikTok yang penggunaannya sedang marak (Ansherina, 2025). Pengguna media sosial secara global diperkirakan mencapai 5,41 miliar pada awal Juli 2025 atau setara 65,7% dari total populasi dunia (Data Reportal, 2025). Media sosial kini menjadi arena strategis bagi merek untuk membangun kesadaran dan loyalitas konsumen melalui pemasaran digital yang inovatif, salah satunya melalui penggunaan influencer media sosial (Taqatqa, 2023).

Di Indonesia, lebih dari 70% populasi aktif menggunakan media sosial, dengan Tiktok sebagai platform yang tumbuh pesat dalam tiga tahun terakhir, terutama di kalangan Generasi Z (Kominfo, 2024). Generasi Z dikenal sebagai digital native dengan pola konsumsi media yang berbeda dari generasi sebelumnya dan sangat responsif terhadap rekomendasi influencer (Nugroho et al., 2022). Di tengah maraknya penggunaan media sosial, influencer marketing muncul sebagai strategi utama untuk membangun kesadaran merek, membentuk persepsi nilai, dan mendorong niat pembelian. Studi terdahulu menegaskan bahwa endorsement melalui influencer dapat memengaruhi persepsi konsumen terhadap merek, terutama dalam meningkatkan kesadaran merek dan nilai yang dirasakan (Patmawati & Miswanto, 2022; Dehghani et al., 2016).

Meskipun banyak penelitian telah mengkaji dampak social media influencer terhadap niat pembelian secara umum, masih kesenjangan pemahaman mengenai mekanisme spesifik yang memengaruhi niat pembelian Generasi Z, khususnya pada platform TikTok. Penelitian sebelumnya kurang mendalami peran mediasi kesadaran merek dan nilai yang dirasakan (AIFarraj et al., 2021). Lukito dan Yustini (2019) menemukan hubungan positif antara endorsement influencer dan nilai yang dirasakan, tetapi konteks platform dan demografi spesifik masih kurang dieksplorasi. Rahman dan Rahayu (2025) menemukan bahwa kredibilitas influencer secara signifikan memengaruhi sikap konsumen sehingga mendorong peningkatan kesadaran merek di kalangan Generasi Z di Indonesia. Andreani et al. (2021) mengkaji influencer media sosial, kesadaran merek, dan keputusan pembelian Generasi Z di Surabaya, namun masih memerlukan eksplorasi lebih dalam pada konteks TikTok.

Penelitian ini bertujuan mengisi kesenjangan tersebut yang secara spesifik menargetkan Generasi Z sebagai audiens dan TikTok sebagai platform utama. Pemahaman yang lebih baik mengenai hubungan antara influencer, kesadaran merek, nilai yang dirasakan, dan niat pembelian diharapkan dapat membantu manajer pemasaran mengambil keputusan yang lebih tepat dalam pemilihan influencer, alokasi anggaran pemasaran, serta peningkatan efektivitas kampanye digital. Berdasarkan latar belakang tersebut, penelitian ini merumuskan lima pertanyaan: apakah influencer media sosial di TikTok berpengaruh langsung terhadap niat pembelian, terhadap kesadaran merek, dan terhadap nilai yang dirasakan; serta apakah kesadaran merek dan nilai yang dirasakan memengaruhi niat pembelian pada Generasi Z.

METODOLOGI

Penelitian ini menggunakan pendekatan kuantitatif dengan rancangan uji hipotesis. Data primer dikumpulkan melalui penyebaran kuesioner daring menggunakan *Google Form*. Dimensi waktu yang digunakan adalah *cross sectional*, yaitu pengumpulan data dari responden yang berbeda pada satu waktu. Teknik pengambilan sampel adalah *non-probability sampling* dengan metode *purposive sampling* (Sekaran & Bougie, 2016). Kriteria responden meliputi: berusia 13-28 tahun (Generasi Z), aktif menggunakan TikTok minimal tiga kali dalam seminggu, pernah terpapar konten promosi *influencer* TikTok dalam enam bulan terakhir, serta memiliki akun TikTok aktif.

Mengacu pada Kline (2016) dan Sekaran & Bougie (2016), ukuran sampel ideal untuk analisis SEM berkisar 200-500 responden. Penelitian ini menetapkan target 200 responden dan memperoleh 267 responden valid. Variabel diukur menggunakan instrumen yang telah teruji dari peneliti terdahulu, yaitu *Social Media Influencer Endorsement* (Yaacob et al., 2021) yang mencakup aspek kredibilitas dan daya tarik influencer sebagaimana ditegaskan Maghfiroh, Yuningsih, dan Rahayu (2022) bahwa daya tarik influencer merupakan atribut penting dalam mempengaruhi respons konsumen; *Brand Awareness* (Molinillo et al., 2017), *Perceived Value* (Bushara et al., 2023), dan *Purchase Intention* (Alwan & Alshurideh, 2022). Seluruh indikator diukur menggunakan skala Likert lima poin dari Sangat Tidak Setuju (1) hingga Sangat Setuju (5) (Sugiyono, 2013).

Uji validitas menggunakan kriteria *factor loading* minimal 0,35 sesuai jumlah sampel 267 responden (Hair et al., 2019), sedangkan uji reliabilitas menggunakan Cronbach's Alpha. Analisis data dilakukan dengan Structural Equation Modeling (SEM) yang dioperasikan melalui program AMOS, karena model melibatkan beberapa variabel dengan hubungan yang saling terkait. Sebelum pengujian hipotesis, dilakukan uji kesesuaian model (goodness of fit). Penelitian ini mengembangkan lima hipotesis: (H1) S*ocial Media Influencer* berpengaruh positif langsung terhadap *Purchase Intention*; (H2) terhadap *Brand Awareness*; (H3) terhadap *Perceived Value*; (H4) *Brand Awareness* berpengaruh positif terhadap *Purchase Intention*; serta (H5) *Perceived Value* berpengaruh positif terhadap *Purchase Intention*.

HASIL DAN PEMBAHASAN

Profil Responden dan Uji Instrumen

Mayoritas responden adalah perempuan (62,2%) dan sisanya adalah laki-laki (37,8%) dari total 267 responden. Hasil uji validitas menunjukkan seluruh item memiliki factor loading di atas 0,35, kecuali item pertama Brand Awareness (BA1) sebesar 0,305 yang dinyatakan tidak valid dan dikeluarkan dari analisis. Hasil uji reliabilitas menunjukkan nilai Cronbach's Alpha berada pada kategori moderat hingga reliabel.

Tabel 1. Hasil Uji Reliabilitas

Variabel	Cronbach's Alpha	Keterangan
Social Media Influencer Endorsement	0,546	Reliabilitas Moderat
Brand Awareness	0,522	Reliabilitas Moderat
Perceived Value	0,670	Reliabel
Purchase Intention	0,570	Reliabilitas Moderat

Sumber: Pengolahan data menggunakan SPSS

Uji Goodness of Fit

Hasil uji goodness of fit menunjukkan empat indikator memenuhi kriteria, yaitu RMSEA (0,062), IFI (0,900), GFI (0,913), dan CMIN/DF (2,020). Menurut Hair et al. (2019), suatu model tetap dinyatakan layak apabila terdapat minimal satu indikator yang memenuhi satu kriteria Goodness of Fit. Oleh karena itu, model penelitian dinyatakan layak dilanjutkan ke pengujian hipotesis.

Tabel 2. Hasil Uji Goodness of Fit

Pengukuran	Nilai	Batas yang Disarankan	Kesim-pulan

CHI Square (CMIN)	230,249	Diharapkan kecil	Poor Fit
Probability	0,000	≥ 0,05	Good Fit
RMSEA	0,062	≤ 0,08	Poor Fit
CFI	0,898	≥ 0,90	Poor Fit
NFI	0,819	≥ 0,90	Poor Fit
TLI	0,878	≥ 0,90	Poor Fit
IFI	0,900	≥ 0,90	Good Fit
GFI	0,913	≥ 0,90	Good Fit
CMIN/DF	2,020	1-5	Good Fit

Sumber: Pengolahan data menggunakan AMOS

Statistik Deskriptif

Hasil analisis deskriptif menunjukkan seluruh variabel memiliki nilai rata-rata pada kategori tinggi. *Purchase Intention* memiliki *mean* tertinggi (3,8071), diikuti *Brand Awareness* (3,7547), *Social Media Influencer Endorsement* (3,6517), dan *Perceived Value* (3,6457). Hal ini mengindikasikan bahwa Generasi Z memiliki niat beli yang kuat serta tingkat kesadaran merek dan persepsi nilai yang positif terhadap produk yang dipromosikan influencer di TikTok.

Tabel 3. Ringkasan Statistik Deskriptif Antarvariabel

Variabel	Mean	Std. Deviasi
Social Media Influencer Endorsement	3,65	0,737
Brand Awareness	3,75	0,701
Perceived Value	3,64	0,731
Purchase Intention	3,80	0,899

Sumber: Pengolahan data menggunakan SPSS

Pengujian Hipotesis

Hasil pengujian kelima hipotesis menggunakan SEM AMOS disajikan pada Tabel 4. Hipotesis dinyatakan didukung apabila nilai *P-value* lebih kecil dari 0,05.

Tabel 4. Hasil Pengujian Hipotesis

Hipotesis	Jalur Hubungan	Estimate	P-Value
H1	SMIE -> Purchase Intention	0,639	0,274
H2	SMIE -> Brand Awareness	0,632	0,000
H3	SMIE -> Perceived Value	1,250	0,000
H4	Brand Awareness -> Purchase Intention	0,300	0,420
H5	Perceived Value -> Purchase Intention	0,138	0,423

Sumber: Pengolahan data menggunakan AMOS

PEMBAHASAN

Hasil pengujian H1 menunjukkan bahwa *Social Media Influencer Endorsement* tidak berpengaruh langsung terhadap *Purchase Intention* (*P-value* 0,274). Temuan ini berbeda dengan Munir & Watts (2025), namun konsisten dengan Al-Mu'ani et al. (2023) yang menemukan bahwa pengaruh endorsement terhadap niat beli memerlukan mediasi *brand attitude*, serta Dewitasari & Hidayah (2024) yang menekankan peran *trust* sebagai *mediator*. Hal ini mengindikasikan bahwa paparan *endorsement* saja belum cukup untuk membangkitkan niat beli tanpa adanya sikap atau kepercayaan positif terhadap merek.

Sebaliknya, H2 dan H3 didukung. *Social Media Influencer Endorsement* berpengaruh positif terhadap *Brand Awareness* (P-value 0,000; estimate 0,632) dan terhadap *Perceived Value* (P-value 0,000; estimate 1,250). Konten endorsement dari *influencer* TikTok terbukti mampu meningkatkan kemampuan Generasi Z mengenali dan mengingat merek, sekaligus membentuk persepsi nilai produk. Temuan ini sejalan dengan Munir & Watts (2025) serta Safitri et al. (2025), dan diperkuat oleh Rahman dan Rahayu (2025) yang menemukan bahwa kredibilitas *influencer* secara signifikan mempengaruhi sikap konsumen sehingga mendorong peningkatan kesadaran merek di kalangan Generasi Z dan Milenial.

Hasil H4 dan H5 menunjukkan bahwa *Brand Awareness* (*P-value* 0,420) dan *Perceived Value* (*P-value* 0,423) tidak berpengaruh signifikan terhadap *Purchase Intention*. Temuan ini sejalan dengan Mauretta et al. (2024) dan Putriana & Abdurrahman (2024) yang menunjukkan bahwa pengaruh kesadaran merek terhadap niat beli memerlukan mediasi *brand trust*, serta Latifah & Fikriah (2024) dan Wijaya & Keni (2022) yang menekankan peran *brand preference* dan *brand attitude*. Robian dan Rahayu (2025) juga menegaskan bahwa persepsi konsumen yang positif terhadap suatu merek dapat meningkatkan daya saing sekaligus niat beli konsumen, sehingga nilai yang dirasakan menjadi pertimbangan penting yang umumnya tetap memerlukan variabel penghubung. Secara keseluruhan, temuan ini memperkuat kerangka SOR bahwa stimulus efektif membentuk proses internal (organisme), tetapi transformasi organisme menjadi respons perilaku pada Generasi Z yang kritis dan selektif memerlukan variabel penghubung tambahan.

KESIMPULAN

Penelitian ini menyimpulkan bahwa *Social Media Influencer Endorsement* di TikTok berpengaruh positif terhadap *Brand Awareness* dan *Perceived Value* pada Generasi Z di Indonesia. Namun, *endorsement* tidak berpengaruh langsung terhadap *Purchase Intention*, demikian pula *Brand Awareness* dan *Perceived Value* tidak berpengaruh signifikan terhadap niat pembelian. Temuan ini mengindikasikan bahwa *endorsement influencer* efektif dalam membangun kesadaran merek dan persepsi nilai, tetapi belum cukup untuk mendorong niat pembelian secara langsung pada Generasi Z yang selektif dan kritis.

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MAPPING DIGITAL AND OMNICHANNEL STRATEGY MODELS THROUGH CUSTOMER ENGAGEMENT AND TECHNOLOGY: AN EMPIRICAL STUDY ON THE EAST JAVA RETAIL INDUSTRY

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Abstract: *This study examines the influence of digital transformation and omnichannel strategies on retail sales performance in East Java, considering customer engagement as a mediating variable and technological competence as a moderating variable. The background of this study was driven by the disruption following the COVID-19 pandemic, which led many large retailers to close because they failed to adapt. At the same time, e-commerce transactions increased rapidly, and consumer shopping patterns shifted. This study aims to develop an integrative model that explains how digitalization and omnichannel strategies increase sales through customer engagement and organizational technological capabilities. The method used is a quantitative explanatory approach employing SEM-PLS, involving approximately 100 respondents from East Java retail MSMEs that have adopted both digital and physical channels. The novelty of this study lies in its use of a moderated mediation model, which is rarely used in the context of Indonesian retail MSMEs, and in its focus on the local context of East Java. We expect to deliver a digital-omnichannel strategy model grounded in engagement and technological competence, publish reputable international articles (Scopus-indexed), produce a policy brief for policymakers, and create a practical guide for MSMEs. This research is also part of a five-year research roadmap that aims to develop a sustainable digital retail ecosystem based on AI and consumer behavior prediction.*

Keywords: *Transformasi Digital; Strategi Omnichannel; Customer Engagement; Kompetensi Teknologi; Kinerja Penjualan.*

PENDAHULUAN

Transformasi digital telah menyebabkan banyak perubahan perilaku konsumen dan menciptakan disrupsi besar dalam industri ritel di Indonesia setelah pandemi Covid-19. Fenomena ini tidak hanya dirasakan oleh usaha kecil dan menengah, tetapi juga oleh ritel-ritel besar yang sebelumnya mendominasi pasar. Sejumlah ritel modern dengan jaringan luas terpaksa menutup gerai, merugi, bahkan mengalami kebangkrutan karena gagal beradaptasi dengan perubahan lanskap bisnis digital (Klein & Todesco, 2021).

Sejak tahun 2020 hingga 2023, beberapa jaringan ritel besar di Indonesia mengalami penurunan kinerja drastis. PT Matahari Department Store Tbk menutup lebih dari 20 gerai dalam dua tahun terakhir akibat rendahnya kunjungan konsumen dan tingginya biaya operasional fisik. Giant, salah satu merek ritel dari Hero Group, secara resmi menutup seluruh gerainya di Indonesia pada pertengahan 2021 karena tidak mampu bersaing dalam ekosistem digital dan berubahnya pola belanja masyarakat.

Laporan dari Asosiasi Pengusaha Ritel Indonesia (APRINDO) menunjukkan bahwa sejak pandemi COVID-19, lebih dari 25% gerai ritel besar mengalami penurunan omset lebih dari 50%. Sementara itu, data dari Goodstats tahun 2022 mencatat bahwa transaksi e-commerce meningkat signifikan hingga mencapai 46,72 Milliar US Dollar per tahun, yang menggeser pola konsumsi dari offline ke online.

Fenomena ini mengindikasikan bahwa hanya ritel yang mampu beradaptasi secara strategis dengan mengadopsi transformasi digital dan pengembangan strategi omnichannel yang dapat bertahan dan tumbuh (Jocevski et al., 2019). Transformasi digital tidak hanya mencakup penggunaan teknologi, tetapi juga menyentuh aspek strategis seperti otomatisasi layanan, integrasi data pelanggan, hingga pengalaman belanja digital yang seamless (Reinartz et al., 2019). Di sisi lain, strategi omnichannel memungkinkan perusahaan mengintegrasikan berbagai kanal (*offline, online, mobile,* sosial media) agar pelanggan bisa berinteraksi dengan *brand* secara konsisten dan personal (Neslin, 2022).

Namun, implementasi strategi omnichannel memerlukan kompetensi teknologi yang memadai dari organisasi. Tanpa kapabilitas teknologi yang kuat, transformasi digital dan strategi omnichannel mungkin tidak mencapai hasil yang diharapkan. Studi dari penelitian menyoroti bahwa transisi ke omnichannel membutuhkan pemahaman mendalam tentang proses transformasi dan tantangan yang terkait (Davis-Sramek et al., 2020).

Di Indonesia, khususnya di Jawa Timur, banyak peritel lokal menghadapi kesulitan dalam mengadopsi strategi digital dan omnichannel karena keterbatasan sumber daya dan pengetahuan teknologi. Oleh karena itu, diperlukan penelitian empiris untuk memahami bagaimana transformasi digital dan strategi omnichannel, yang dimediasi oleh keterlibatan pelanggan dan dimoderasi oleh kompetensi teknologi, mempengaruhi kinerja penjualan di sektor ritel Jawa Timur.

Penelitian ini bertujuan untuk mengembangkan model strategis yang mengintegrasikan faktor- faktor tersebut, sehingga dapat memberikan panduan praktis bagi peritel lokal dalam meningkatkan kinerja penjualan di era digital (Isharyani et al., 2024).

Rumusan Masalah Penelitian

1. Bagaimana pengaruh transformasi digital (X1) terhadap kinerja penjualan (Y)?
2. Bagaimana pengaruh strategi omnichannel (X2) terhadap kinerja penjualan (Y)?
3. Bagaimana pengaruh transformasi digital (X1) terhadap *customer engagement* (M)?
4. Bagaimana pengaruh strategi omnichannel (X2) terhadap *customer engagemen*t (M)?
5. Bagaimana pengaruh *customer engagement* (M) terhadap kinerja penjualan (Y)?
6. Bagaimana pengaruh kompetensi teknologi (Z) dalam memoderasi hubungan antara strategi omnichannel (X2) terhadap kinerja penjualan (Y)?
7. Bagaimana pengaruh kompetensi teknologi (Z) dalam memoderasi hubungan antara *customer*

engagement (M) terhadap kinerja penjualan (Y)?

8. Apakah *customer engagement* (M) memediasi hubungan antara transformasi digital (X1) terhadap kinerja penjualan (Y)?
9. Apakah *customer engagement* (M) memediasi hubungan antara strategi omnichannel (X2) terhadap kinerja penjualan (Y)?

Penelitian ini menggunakan pendekatan kuantitatif eksplanatori dengan model analisis struktural (SEM-PLS) untuk menguji hubungan kausal antar variabel (Taguchi, 2018). Pendekatan ini dipilih karena mampu menangkap hubungan langsung, tidak langsung (mediasi), serta interaksi (moderasi) secara simultan dalam model yang kompleks.

Data dikumpulkan melalui survei kepada pelaku usaha ritel di wilayah Jawa Timur yang telah menerapkan kanal penjualan digital dan konvensional. Analisis dilakukan dengan menggunakan Partial Least Square untuk menguji signifikansi jalur pengaruh (path coefficient) serta moderated mediation model guna melihat peran ganda customer engagement dan kompetensi teknologi dalam mempengaruhi kinerja penjualan

Penelitian mengenai transformasi digital dan strategi omnichannel telah banyak dilakukan dalam konteks global. Pentingnya integrasi saluran digital dalam menciptakan pengalaman pelanggan yang kohesif (Mishra et al., 2024). Sementara itu, customer engagement menjadi elemen kunci dalam menciptakan nilai jangka panjang bagi perusahaan (Abo ElHamd et al., 2022).

Namun, sebagian besar penelitian masih bersifat parsial hanya mengkaji hubungan langsung antara digitalisasi dan performa penjualan tanpa mempertimbangkan peran mediasi dari engagement dan peran moderasi dari kompetensi teknologi. Di Indonesia sendiri, studi yang menguji model komprehensif berbasis pendekatan mediasi dan moderasi dalam konteks ritel lokal terutama di Jawa Timur masih sangat terbatas.

METODOLOGI

Penelitian ini dirancang untuk mencapai tujuan utama yaitu membangun dan menguji model strategi digital dan omnichannel melalui *customer engagement* dan kompetensi teknologi dalam meningkatkan kinerja penjualan sektor ritel di Jawa Timur. Metode yang digunakan adalah pendekatan kuantitatif eksplanatori berbasis model struktural (*Structural Equation Modeling–SEM*), dengan menggunakan teknik *Partial Least Square* (PLS-SEM) karena kemampuannya dalam menguji hubungan langsung, tidak langsung (mediasi), serta interaksi (moderasi) secara simultan.

Penelitian ini mengusulkan *moderated mediation model*, di mana *customer engagement* bertindak sebagai variabel mediasi antara transformasi digital dan strategi omnichannel terhadap sales performance, sementara technology competence bertindak sebagai variabel moderasi dalam hubungan engagement terhadap kinerja penjualan.

Tahapan prosedural penelitian terdiri atas:

1. Studi Literatur dan Penyusunan Hipotesis
   a. Mengkaji hasil penelitian sebelumnya dari jurnal bereputasi (Scopus dan

Sinta) untuk membangun landasan teori dan 9 hipotesis dalam kerangka konseptual.
   b. Hasil: kerangka pemikiran konseptual dan daftar indikator variabel.
2. Penyusunan dan Validasi Instrumen
   a. Menyusun kuesioner berbasis skala Likert dengan indikator variabel dari literatur terpilih.
   b. Validasi isi oleh ahli (expert judgement) dan uji coba skala kecil untuk validitas dan reliabilitas awal.
   c. Hasil: instrumen yang valid dan reliabel untuk pengumpulan data utama.
3. Pengumpulan Data Primer
   a. Survei kepada minimal 100 pelaku usaha ritel (khususnya UMKM) di Jawa Timur yang telah mengadopsi kanal digital dan fisik.
   b. Teknik sampling: purposive sampling, dengan kriteria: pelaku ritel aktif, memiliki kanal penjualan digital (marketplace, media sosial, atau website), serta bersedia menjadi responden.
   c. Hasil: data primer siap olah.
4. Analisis Data dan Pengujian Model
   a. Analisis dilakukan menggunakan software SmartPLS untuk menguji direct effect, indirect effect (mediasi), dan interaction effect (moderasi).
   b. Uji kualitas data: outer loading, AVE, composite reliability, dan discriminant validity.
   c. Uji hipotesis: bootstrapping dan pengujian jalur (path coefficient).
   d. Hasil: model empiris dan signifikansi hubungan antar variabel.
5. Pengembangan Model Strategi
   a. Menginterpretasi hasil untuk menyusun model strategi digital dan omnichannel yang paling efektif diimplementasikan pada pelaku ritel lokal.
   b. Model dikemas dalam bentuk infografis dan dokumen naratif untuk UMKM.
6. Populasi dalam penelitian ini adalah seluruh pelaku UMKM ritel di Provinsi Jawa Timur yang telah menerapkan kanal digital (e-commerce, media sosial, website) dan kanal fisik (toko offline). Fokus diarahkan pada wilayah perkotaan dengan aktivitas ritel padat seperti Surabaya, Sidoarjo, Gresik, Malang dan Madiun.

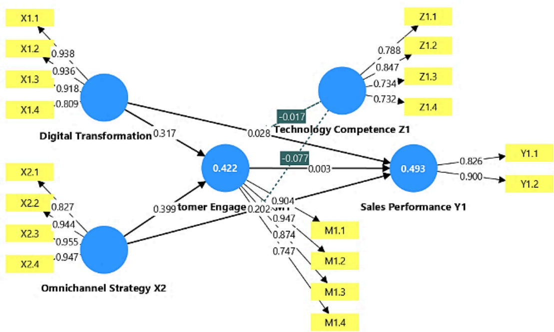
Teknik pengambilan sampel menggunakan purposive sampling, dengan kriteria inklusi:

1. UMKM ritel aktif minimal 2 tahun terakhir,
2. Menggunakan minimal satu kanal penjualan digital,
3. Pemilik atau manajer bersedia menjadi responden dan memahami aktivitas bisnisnya,
4. Berlokasi di Jawa Timur.

Penentuan Ukuran Sampel menggunakan Rule of Thumb SEM (Hair et al., 2019), Jika model memiliki 6 latent variables dan total indikator 30, maka: 5–10 × jumlah indikator → 100 responden

HASIL DAN PEMBAHASAN

Hasil Penelitian



Gambar 1. PLS-SEM *Algorithm*

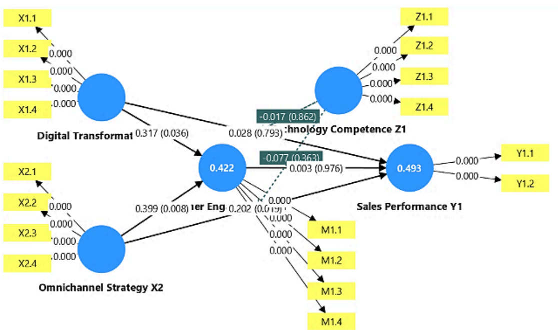
Seluruh indikator memiliki nilai outer loading di atas 0.70, yang menunjukkan bahwa semua indikator mampu menjelaskan konstruknya dengan baik. Nilai AVE juga seluruhnya di atas 0.50, artinya variabel laten mampu menjelaskan lebih dari 50% varians indikator-indikatornya. Dengan demikian, semua konstruk dinyatakan memenuhi kriteria convergent validity.

Tabel 1. Hasil Uji Reliabilitas Konstruk

Variabel	Cronbach's Alpha	Composite Reliability
Customer Engagement (M1)	0.894	0.926
Digital Transformation (X1)	0.923	0.946
Omnichannel Strategy (X2)	0.938	0.956
Sales Performance (Y1)	0.666	0.855
Technology Competence (Z1)	0.781	0.858

Semua konstruk memiliki nilai *Composite Reliability* (CR) > 0.70, sehingga reliabilitas konstruk dapat diterima.

Variabel *Sales Performance* (Y1) memiliki nilai *Cronbach's Alpha* sebesar 0.666, sedikit di bawah ambang batas 0.70, namun masih dapat diterima karena nilai CR = 0.855 (lebih dari 0.70) dan AVE = 0.747 yang menunjukkan konsistensi internal yang cukup baik (Hair et al., 2019).



Gambar 2. *Bootstrapping*

Pengaruh *Digital Transformation* (X1) terhadap *Customer Engagement* (M1)

Hasil menunjukkan pengaruh positif dan signifikan (β = 0.317; p = 0.036 < 0.05). Ini berarti semakin tinggi tingkat transformasi digital yang diadopsi oleh pelaku ritel, semakin besar pula keterlibatan pelanggan (*customer engagement*) yang tercipta. Hal ini konsisten dengan teori Reinartz et al. (2019) yang menyatakan digitalisasi meningkatkan pengalaman pelanggan melalui otomatisasi layanan dan interaksi real-time

Pengaruh *Omnichannel Strategy* (X2) terhadap *Customer Engagement* (M1)

Koefisien jalur sebesar 0.399 dengan p = 0.008 menunjukkan pengaruh yang positif dan signifikan. Artinya, semakin baik integrasi kanal penjualan (*offline–online*), semakin tinggi pula tingkat keterlibatan pelanggan. Hasil ini mendukung temuan Gao et al. (2021) yang menyatakan bahwa integrasi kanal mampu memperkuat *customer journey* dan loyalitas pelanggan.

Pengaruh *Omnichannel Strategy* (X2) terhadap *Sales Performance* (Y1)

Ditemukan pengaruh langsung yang signifikan (β = 0.202; p = 0.019). Hal ini menandakan bahwa strategi omnichannel memiliki kontribusi nyata terhadap peningkatan kinerja penjualan ritel. Artinya, pelanggan yang dapat berinteraksi secara fleksibel di berbagai kanal cenderung meningkatkan volume pembelian.

Pengaruh *Digital Transformation* (X1) terhadap *Sales Performance* (Y1)

Nilai koefisien sebesar 0.028 dengan p = 0.793 (> 0.05) menunjukkan bahwa transformasi digital tidak berpengaruh langsung signifikan terhadap kinerja penjualan. Hal ini mengindikasikan bahwa dampak transformasi digital lebih bersifat tidak langsung melalui customer engagement atau variabel lain.

Pengaruh *Customer Engagement* (M1) terhadap *Sales Performance* (Y1)

Jalur ini tidak signifikan (β = 0.003; p = 0.976), yang berarti keterlibatan pelanggan tidak secara langsung meningkatkan kinerja penjualan. Hal ini dapat disebabkan oleh tingkat loyalitas pelanggan yang belum konsisten meskipun interaksi digital meningkat.

Pengaruh *Technology Competence* (Z1) terhadap *Sales Performance* (Y1)

Koefisien sebesar 0.666 dengan p = 0.000 (< 0.001) menunjukkan pengaruh positif dan sangat signifikan. Artinya, kompetensi teknologi organisasi memainkan peran penting dalam meningkatkan efektivitas digitalisasi dan strategi omnichannel terhadap hasil penjualan. Hasil ini memperkuat pandangan Dwivedi et al. (2021) bahwa kesiapan teknologi merupakan fondasi keberhasilan transformasi digital ritel.

Efek Moderasi *Technology Competence* (Z1)

Moderasi Z1 × X1 → Y1: Tidak signifikan (p = 0.862), menunjukkan kompetensi teknologi belum memperkuat hubungan antara transformasi digital dan kinerja penjualan.

Moderasi Z1 × X2 → Y1: Tidak signifikan (p = 0.363), mengindikasikan bahwa kompetensi teknologi tidak secara langsung memperkuat dampak strategi omnichannel terhadap penjualan.

Hal ini mungkin disebabkan oleh variasi adopsi teknologi antar pelaku UMKM yang masih beragam.

Tabel 6. Nilai R-Square (R^2)

Konstruk Endogen	R^2	Keterangan
Customer Engagement (M1)	0.422	Moderat
Sales Performance (Y1)	0.493	Moderat

Nilai R^2 untuk variabel *Customer Engagement* sebesar 0.422 menunjukkan bahwa 42,2% variasi *engagement* pelanggan dapat dijelaskan oleh transformasi digital dan strategi omnichannel. Sementara nilai R^2 sebesar 0.493 menunjukkan bahwa 49,3% variasi kinerja penjualan dapat dijelaskan oleh seluruh konstruk prediktor dalam model (X1, X2, M1, dan Z1). Berdasarkan klasifikasi Hair et al. (2019), nilai tersebut termasuk kategori moderat, yang berarti model memiliki kemampuan prediktif yang cukup baik.

PEMBAHASAN

1. Pengaruh Transformasi Digital terhadap *Customer Engagement*

Hasil penelitian menunjukkan bahwa transformasi digital berpengaruh positif dan signifikan terhadap *customer engagement* (β = 0.317; p = 0.036). Temuan ini mendukung teori Reinartz et al. (2019) yang menyatakan bahwa digitalisasi mampu memperkaya interaksi pelanggan melalui otomatisasi layanan, sistem personalisasi, dan integrasi kanal daring. Dalam konteks UMKM ritel di Jawa Timur, hasil ini mengindikasikan bahwa penggunaan teknologi seperti aplikasi kasir digital, sistem pelanggan berbasis CRM, atau pemanfaatan platform media sosial telah membantu meningkatkan kedekatan interaksi dengan konsumen. Pelanggan merasa lebih terlibat karena komunikasi menjadi dua arah, cepat, dan berbasis data. Secara teoritis, temuan ini memperkuat konsep *Technology-to-Performance Chain* (Goodhue & Thompson, 1995), di mana kemampuan organisasi dalam menggunakan teknologi secara efektif berdampak langsung pada kualitas hubungan dan interaksi dengan pelanggan.

2. Pengaruh Strategi Omnichannel terhadap *Customer Engagement*

Strategi omnichannel terbukti memiliki pengaruh yang signifikan terhadap customer engagement (β = 0.399; p = 0.008). Hasil ini sejalan dengan temuan Gao et al.

(2021) yang menyebutkan bahwa integrasi kanal online dan offline dapat meningkatkan pengalaman pelanggan dan memperkuat hubungan jangka panjang dengan brand. Bagi UMKM ritel di Jawa Timur, hasil ini menegaskan bahwa pelaku usaha yang menggabungkan toko fisik dengan platform digital (seperti marketplace dan media sosial) mampu menciptakan pengalaman belanja yang lebih fleksibel. Misalnya, pelanggan dapat melakukan online browsing namun memilih untuk melakukan pembayaran atau pengambilan barang langsung di toko (click and collect). Implikasi praktisnya, UMKM perlu berinvestasi dalam sinkronisasi data antara kanal *offline* dan *online* agar pelanggan memperoleh pengalaman yang konsisten, misalnya melalui integrasi stok produk, sistem loyalitas pelanggan, atau layanan purna jual lintas kanal.

3. Pengaruh Strategi Omnichannel terhadap Kinerja Penjualan

Pengaruh positif dan signifikan (β = 0.202; p = 0.019) menunjukkan bahwa penerapan strategi omnichannel secara efektif meningkatkan kinerja penjualan. Hal ini mendukung penelitian Vhatkar et al. (2024) yang menegaskan bahwa digitalisasi saluran penjualan memperluas jangkauan pasar dan efisiensi transaksi, sehingga mampu mendorong peningkatan volume penjualan dan profitabilitas. Dalam konteks lokal, UMKM yang memanfaatkan lebih dari satu kanal penjualan (misalnya kombinasi antara toko fisik, Shopee, Tokopedia, dan WhatsApp Business) menunjukkan peningkatan omset yang lebih stabil. Hal ini memperlihatkan kemampuan omnichannel untuk mengurangi risiko penurunan penjualan akibat fluktuasi permintaan di satu kanal tertentu. Secara teoritis, temuan ini memperkuat konsep multi-channel customer management (Neslin, 2022), bahwa sinergi antar kanal penjualan menciptakan nilai tambah dan keunggulan kompetitif bagi pelaku bisnis ritel.

4. Pengaruh Transformasi Digital terhadap Kinerja Penjualan

Meskipun koefisien menunjukkan arah positif (β = 0.028), pengaruh transformasi digital terhadap kinerja penjualan tidak signifikan (p = 0.793). Hasil ini mengindikasikan bahwa digitalisasi pada tahap awal belum serta merta memberikan peningkatan pendapatan. Kondisi ini umum terjadi pada UMKM ritel di Jawa Timur yang masih berada dalam fase adopsi digital parsial — misalnya, baru menggunakan media sosial sebagai etalase promosi tanpa mengoptimalkan fitur transaksi daring atau sistem manajemen pelanggan. Temuan ini menegaskan pandangan Li (2023) bahwa transformasi digital memerlukan waktu dan kesiapan sumber daya manusia untuk dapat menghasilkan dampak finansial. Digitalisasi yang tidak diimbangi dengan strategi pengelolaan data pelanggan, analitik penjualan, dan infrastruktur digital dapat menyebabkan hasil yang tidak signifikan terhadap kinerja keuangan.

5. Peran *Customer Engagement* terhadap Kinerja Penjualan

Hasil analisis menunjukkan bahwa pengaruh *customer engagement* terhadap kinerja penjualan tidak signifikan (β = 0.003; p = 0.976). Hal ini menunjukkan bahwa tingkat keterlibatan pelanggan belum secara langsung berkontribusi pada peningkatan omset penjualan. Fenomena ini dapat dijelaskan karena sebagian besar pelanggan UMKM ritel di Jawa Timur masih berinteraksi secara transaksional, belum terbentuk loyalitas jangka panjang. *Engagement* pelanggan mungkin tinggi di media sosial (seperti likes, komentar, atau interaksi online), tetapi belum terkonversi menjadi pembelian berulang. Temuan ini memperkuat hasil Abo ElHamd et al. (2022) bahwa engagement hanya berdampak nyata pada kinerja penjualan apabila diikuti dengan strategi retensi pelanggan yang efektif seperti program loyalitas atau personalisasi produk.

6. Pengaruh Kompetensi Teknologi terhadap Kinerja Penjualan

Kompetensi teknologi terbukti memiliki pengaruh paling kuat terhadap kinerja penjualan ($\beta = 0.666$; $p = 0.000$). Hasil ini sangat signifikan dan mendukung teori Dwivedi et al. (2021) yang menegaskan bahwa kapabilitas teknologi menjadi faktor kunci keberhasilan dalam ekosistem ritel digital. UMKM dengan kemampuan teknologi tinggi seperti penguasaan sistem kasir digital, analitik data penjualan, atau integrasi inventori online cenderung lebih efisien dalam operasional dan cepat merespons permintaan pasar. Implikasi praktisnya, pelaku UMKM di Jawa Timur perlu meningkatkan literasi digital dan pelatihan teknologi, baik melalui program pendampingan pemerintah maupun kolaborasi dengan platform digital. Kompetensi teknologi terbukti tidak hanya sebagai penunjang efisiensi, tetapi juga sebagai sumber keunggulan bersaing yang berkelanjutan.

7. Peran Moderasi Kompetensi Teknologi

Hasil penelitian menunjukkan bahwa kompetensi teknologi tidak memoderasi hubungan antara transformasi digital dan strategi omnichannel terhadap kinerja penjualan. Hal ini menandakan bahwa efek teknologi lebih kuat secara langsung daripada sebagai variabel interaksi. Dalam konteks UMKM Jawa Timur, banyak pelaku usaha yang sudah mulai mengadopsi teknologi dasar (misalnya pembayaran QRIS atau media sosial) namun belum mengintegrasikannya secara sistematis ke dalam seluruh proses bisnis. Akibatnya, kemampuan teknologi belum mampu memperkuat hubungan antar variabel strategis. Temuan ini menunjukkan adanya kesenjangan antara adoption dan integration phase pada proses transformasi digital UMKM (Isharyani et al., 2024).

Secara keseluruhan, model penelitian menunjukkan bahwa Omnichannel *Strategy* merupakan variabel paling dominan yang memengaruhi baik *Customer Engagement* maupun *Sales Performance*. Sedangkan *Technology Competence* menjadi faktor kunci yang berperan langsung terhadap peningkatan kinerja penjualan, bukan sebagai moderator. Model empiris ini mengindikasikan bahwa UMKM ritel di Jawa Timur cenderung memperoleh manfaat nyata dari kemampuan teknologi yang tinggi dan penerapan strategi penjualan lintas kanal. Namun, engagement pelanggan masih belum mampu menjadi jembatan signifikan untuk peningkatan penjualan, menandakan perlunya optimalisasi strategi personalisasi dan interaksi pasca pembelian.

KESIMPULAN

Berdasarkan hasil analisis data menggunakan pendekatan SEM-PLS serta pembahasan pada bab sebelumnya, maka penelitian ini menghasilkan beberapa kesimpulan penting sebagai berikut:

1. Transformasi Digital Meningkatkan *Customer Engagement*, namun Tidak Berpengaruh Langsung pada Kinerja Penjualan

Transformasi digital terbukti berpengaruh positif dan signifikan terhadap *customer engagement*, menunjukkan bahwa adopsi teknologi mampu meningkatkan kualitas interaksi dengan pelanggan. Namun, digitalisasi belum secara langsung meningkatkan kinerja penjualan. Hal ini menunjukkan bahwa UMKM ritel di Jawa Timur masih pada tahap awal pemanfaatan teknologi sehingga dampaknya belum terlihat secara finansial.

2. Strategi Omnichannel Berpengaruh Signifikan terhadap *Customer Engagement* dan Kinerja Penjualan

Omnichannel menjadi variabel yang paling konsisten memberikan dampak signifikan baik terhadap keterlibatan pelanggan maupun terhadap kinerja penjualan. Integrasi kanal online–offline terbukti efektif dalam memperluas jangkauan pasar dan mendukung fleksibilitas perilaku belanja konsumen.

3. *Customer Engagement* Belum Berpengaruh Signifikan terhadap Kinerja Penjualan

Keterlibatan pelanggan belum mampu meningkatkan kinerja penjualan secara langsung. Hal ini mengindikasikan bahwa interaksi pelanggan yang terjadi belum sepenuhnya terkonversi menjadi transaksi pembelian maupun loyalitas pelanggan.

4. Kompetensi Teknologi Memiliki Pengaruh Paling Kuat terhadap Kinerja Penjualan

Kompetensi teknologi merupakan variabel dengan pengaruh terbesar terhadap peningkatan kinerja penjualan. UMKM yang memiliki kemampuan teknologi tinggi mampu merespon permintaan secara lebih cepat, efisien, dan terukur sehingga berdampak signifikan terhadap performa penjualan.

5. Peran Moderasi Kompetensi Teknologi Tidak Signifikan

Kompetensi teknologi tidak memperkuat hubungan antara transformasi digital maupun strategi omnichannel terhadap kinerja penjualan. Hal ini menunjukkan bahwa pengaruh teknologi lebih dominan secara langsung, sementara pengaruh interaksi antar variabel strategis belum cukup kuat dalam konteks UMKM.

6. Model Memiliki Kemampuan Prediktif Moderat

Nilai R^2 untuk customer engagement (0.422) dan sales performance (0.493) menunjukkan model penelitian mampu menjelaskan variabilitas konstruk secara moderat. Model empiris ini telah memberikan gambaran menyeluruh mengenai faktor-faktor yang memengaruhi keberhasilan ritel digital di Jawa Timur.

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PENGARUH *CURRENT RATIO, TOTAL ASSET TURN OVER* DAN *NET PROFIT MARGIN* TERHADAP *RETURN ON ASSET*

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Abstract: *In general, most companies focus primarily on maximizing profits. They often overlook corporate obligations and fail to consider whether their assets are being effectively utilized for the company's benefit, even though these obligations and assets play a crucial role in achieving profitability. This study examines the factors influencing the return on assets of PT Nippon Indosari Corpindo Tbk, using the current ratio, total asset turnover, and net profit margin as independent variables. The objective of this research is to calculate and analyze the impact of the current ratio, total asset turnover, and net profit margin on the return on assets at PT Nippon Indosari Corpindo Tbk. Multiple regression analysis was employed as the data analysis method. The study utilized secondary data, specifically the financial statements of PT Nippon Indosari Corpindo Tbk—a company listed on the Indonesia Stock Exchange—covering the period from 2020 to 2025. These financial statements were subsequently analyzed using financial ratio analysis. The results indicate that the current ratio, total asset turnover, and net profit margin collectively (simultaneously) have a significant effect on the return on assets, with a significance value of 0.000. Individually (partially), the analysis reveals that the current ratio has a negative and insignificant effect on the return on assets (significance value of 0.892), whereas total asset turnover and net profit margin have a significant effect, with significance values of 0.008 and 0.002, respectively.*

Keywords: *Return on Assets, Current Ratio, Total Asset Turnover, Net Profit Margin*

PENDAHULUAN

Perkembangan industri makanan dan minuman di Indonesia yang terus mengalami pertumbuhan menunjukkan semakin tingginya tingkat persaingan antarperusahaan. Kondisi tersebut menuntut setiap perusahaan untuk mampu mengelola sumber daya secara efektif dan efisien agar dapat mempertahankan daya saing serta meningkatkan kinerja perusahaan. Keberhasilan perusahaan dalam menghadapi persaingan tidak hanya ditentukan oleh kemampuan menghasilkan produk yang berkualitas, tetapi juga oleh kemampuan mengelola kondisi keuangan secara optimal sehingga mampu menciptakan keuntungan yang berkelanjutan.

Kinerja keuangan merupakan salah satu indikator yang digunakan untuk menilai tingkat keberhasilan perusahaan dalam mengelola sumber daya yang dimiliki. Menurut Halim dan Hanafi (2014), kinerja keuangan dapat dianalisis melalui laporan keuangan dengan menggunakan berbagai rasio keuangan yang menggambarkan hubungan antarpos dalam laporan keuangan. Analisis rasio keuangan memberikan informasi mengenai kondisi likuiditas, aktivitas, solvabilitas, dan profitabilitas perusahaan yang menjadi dasar dalam pengambilan keputusan bagi manajemen maupun pihak eksternal.

Salah satu rasio yang sering digunakan untuk mengukur kinerja keuangan adalah *Return on Asset* (ROA).

ROA merupakan rasio profitabilitas yang menunjukkan kemampuan perusahaan dalam menghasilkan laba berdasarkan seluruh aset yang dimiliki. Semakin tinggi nilai ROA, semakin efektif perusahaan dalam memanfaatkan asetnya untuk menghasilkan keuntungan. Oleh karena itu, ROA menjadi salah satu indikator penting dalam mengevaluasi efisiensi pengelolaan aset perusahaan.

Dalam upaya meningkatkan profitabilitas, perusahaan tidak hanya dituntut untuk meningkatkan penjualan, tetapi juga harus mampu mengelola likuiditas dan efektivitas penggunaan aset. Perusahaan yang hanya berorientasi pada peningkatan penjualan tanpa memperhatikan kondisi aset lancar dan pemanfaatan aset tetap berpotensi mengalami penurunan efisiensi yang pada akhirnya berdampak terhadap penurunan profitabilitas. Oleh karena itu, faktor-faktor seperti *Current Ratio* (CR), *Total Assets Turn Over* (TATO), dan *Net Profit Margin* (NPM) menjadi variabel yang penting untuk dianalisis karena memiliki keterkaitan dengan kemampuan perusahaan dalam menghasilkan laba.

Current Ratio (CR) merupakan rasio likuiditas yang digunakan untuk mengukur kemampuan perusahaan dalam memenuhi kewajiban jangka pendeknya menggunakan aset lancar yang dimiliki. Menurut Halim dan Hanafi (2014:75), current ratio yang terlalu tinggi tidak selalu menunjukkan kondisi perusahaan yang baik, karena dapat mengindikasikan adanya aset lancar yang menganggur *(idle assets)* sehingga dana yang tersedia tidak dimanfaatkan secara produktif. Kondisi tersebut berpotensi menurunkan tingkat profitabilitas perusahaan yang diukur melalui *Return on Asset.*

Selain likuiditas, efektivitas penggunaan aset juga mempengaruhi tingkat profitabilitas perusahaan. *Total Assets Turn Over* (TATO) merupakan rasio aktivitas yang mengukur kemampuan perusahaan dalam memanfaatkan seluruh aset untuk menghasilkan penjualan. Menurut Halim dan Hanafi (2014:79), semakin tinggi nilai TATO menunjukkan bahwa perusahaan semakin efisien dalam menggunakan aset yang dimiliki untuk menghasilkan pendapatan. Efisiensi tersebut pada akhirnya akan meningkatkan laba perusahaan sehingga berdampak positif terhadap Return on Asset.

Faktor lain yang berpengaruh terhadap profitabilitas adalah *Net Profit Margin* (NPM). Rasio ini menunjukkan kemampuan perusahaan menghasilkan laba bersih dari setiap rupiah penjualan. Menurut Halim dan Hanafi (2014:79), semakin tinggi nilai *Net Profit Margin* maka semakin besar kemampuan perusahaan memperoleh laba bersih pada tingkat penjualan tertentu. Dengan demikian, peningkatan NPM mencerminkan efisiensi operasional perusahaan yang pada akhirnya dapat meningkatkan *Return on Asset*.

Objek penelitian ini adalah PT Nippon Indosari Corpindo Tbk, salah satu perusahaan manufaktur yang bergerak di subsektor makanan dan minuman dengan produk utama bermerek Sari Roti.

Perusahaan ini dipilih karena merupakan salah satu perusahaan yang memiliki kinerja dan perkembangan yang menarik untuk dianalisis, terutama dalam kaitannya dengan pengaruh likuiditas, aktivitas, dan profitabilitas terhadap kemampuan perusahaan menghasilkan laba melalui pemanfaatan aset yang dimiliki.

Berdasarkan data keuangan perusahaan yang disajikan pada Tabel 1.1, terlihat bahwa perubahan nilai *Return on Asset* tidak selalu sejalan dengan perubahan *Current Ratio, Total Assets Turn Over,* maupun *Net Profit Margin*. Pada beberapa periode, peningkatan *Current Ratio* tidak diikuti oleh peningkatan *Return on Asset*, demikian pula peningkatan *Total Assets Turn Over* dan *Net Profit Margin* belum tentu diikuti oleh peningkatan *Return on Asset*. Fenomena tersebut menunjukkan adanya ketidakkonsistenan hubungan antara variabel-variabel tersebut sehingga menarik untuk dikaji lebih lanjut melalui penelitian empiris.

Berdasarkan uraian tersebut, masih terdapat perbedaan antara teori yang menyatakan bahwa *Current Ratio, Total Assets Turn Over,* dan *Net Profit Margin* memengaruhi Return on Asset dengan fenomena yang terjadi pada PT Nippon Indosari Corpindo Tbk. Oleh karena itu, penelitian ini dilakukan untuk menganalisis pengaruh *Current Ratio, Total Assets Turn Over*, dan *Net Profit Margin* terhadap *Return on Asset* pada PT Nippon Indosari Corpindo Tbk. Hasil penelitian diharapkan dapat memberikan kontribusi bagi pengembangan ilmu pengetahuan di bidang manajemen keuangan serta menjadi bahan pertimbangan bagi perusahaan dalam meningkatkan kinerja keuangan melalui pengelolaan likuiditas, aktivitas, dan profitabilitas secara lebih efektif.

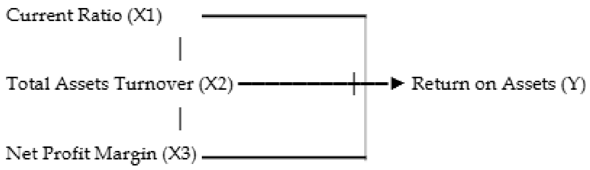
Rumusan Masalah

Berdasarkan latar belakang penelitian, maka rumusan masalah

METODOLOGI

Current ratio yang terlalu tinggi setidak baik bagi profitabilitas yang diukur dengan return on asset. Hal ini karena current ratio yang terlalu tinggi menunjukkan kelebihan aktiva lancar yang menganggur dan berarti bahwa aktiva lancar menghasilkan return yang lebih rendah dibandingkan dengan aktiva tetap. Total asset turn over merupakan rasio yang digunakan untuk mengukur sejauh mana kemampuan perusahaan menghasilkan penjualan berdasarkan seluruh aktiva yang dimiliki perusahaan. Semakin tinggi rasio ini menunjukkan manajemen mampu memanfaatkan seluruh total aktiva dengan baik untuk

menghasilkan penjualan. Apabila penjualan perusahaan tinggi maka keuntungan yang diperoleh perusahaan semakin tinggi. Tetapi jika rasio ini rendah manajamen belum mampu memaksimalkan seluruh total aktiva yang dimiliki perusahaan untuk menghasilkan penjualan. Jika penjualan perusahaan menurun maka keuntungan yang dihasilkan perusahaan semakin rendah. Semakin tinggi net profit margin maka semakin baik kemampuan perusahaan untuk mendapatkan keuntungan yang lebih tinggi. Berdasarkan penjelasan diatas, maka disusun kerangka pemikiran sebagai berikut:



Gambar 1.1 Kerangka Pemikiran

Hipotesis Penelitian

Hipotesis dalam penelitian ini merupakan jawaban sementara terhadap masalah penelitian. Berdasarkan latar belakang masalah dan batasan masalah maka hipotesis yang diambil adalah:

Pengaruh *Current Ratio* terhadap *Return on Assets*

Menurut Halim dan Hanafi (2014), *Current Ratio* (CR) merupakan rasio likuiditas yang digunakan untuk mengukur kemampuan perusahaan dalam memenuhi kewajiban jangka pendeknya menggunakan aset lancar. *Current Ratio* yang terlalu tinggi menunjukkan adanya kelebihan aset lancar yang menganggur (*idle assets*), sehingga pemanfaatan aset menjadi kurang efisien dan dapat menurunkan tingkat profitabilitas perusahaan. Sebaliknya, *Current Ratio* yang berada pada tingkat optimal menunjukkan bahwa perusahaan mampu mengelola modal kerja secara efektif tanpa mengurangi kemampuan menghasilkan laba. Dengan demikian, pengelolaan *Current Ratio* yang baik diperkirakan akan mempengaruhi *Return on Assets* (ROA). Berdasarkan teori tersebut, hipotesis penelitian dirumuskan sebagai berikut.

H1: *Current Ratio* (CR) berpengaruh terhadap *Return on Assets* (ROA) pada PT Nippon Indosari Corpindo Tbk yang terdaftar di Bursa Efek Indonesia.

Pengaruh Total Assets Turnover terhadap Return on Assets

Menurut Halim dan Hanafi (2014), *Total Assets Turnover* (TATO) merupakan rasio aktivitas yang menunjukkan kemampuan perusahaan dalam memanfaatkan seluruh aset untuk menghasilkan penjualan. Semakin tinggi nilai *Total Assets Turnover*, semakin efisien penggunaan aset perusahaan dalam menciptakan penjualan. Efisiensi penggunaan aset tersebut akan meningkatkan peluang perusahaan memperoleh laba yang lebih besar, sehingga berdampak pada meningkatnya *Return on Assets* (ROA). Berdasarkan teori tersebut, hipotesis penelitian dirumuskan sebagai berikut.

H2: *Total Assets Turnover* (TATO) berpengaruh positif terhadap *Return on Assets* (ROA) pada PT Nippon Indosari Corpindo Tbk yang terdaftar di Bursa Efek Indonesia.

Pengaruh Net Profit Margin terhadap Return on Assets

Menurut Halim dan Hanafi (2014), *Net Profit Margin* (NPM) merupakan rasio profitabilitas yang menunjukkan kemampuan perusahaan menghasilkan laba bersih dari setiap rupiah penjualan. Semakin tinggi *Net Profit Margin*, semakin besar laba bersih yang diperoleh perusahaan, sehingga semakin tinggi pula kemampuan perusahaan dalam menghasilkan keuntungan dari aset yang dimiliki. Oleh karena itu, peningkatan *Net Profit Margin* diperkirakan akan meningkatkan *Return on Assets* (ROA). Berdasarkan teori tersebut, hipotesis penelitian dirumuskan sebagai berikut.

H3: *Net Profit Margin* (NPM) berpengaruh positif terhadap *Return on Assets* (ROA) pada PT Nippon Indosari Corpindo Tbk yang terdaftar di Bursa Efek Indonesia.

Pengaruh *Current Ratio, Total Assets Turnover,* dan *Net Profit Margin* terhadap *Return on Assets*

Berdasarkan teori rasio keuangan yang dikemukakan oleh Halim dan Hanafi (2014), tingkat profitabilitas perusahaan dipengaruhi oleh kemampuan perusahaan dalam mengelola likuiditas, memanfaatkan aset secara efisien, dan menghasilkan laba dari aktivitas penjualan. *Current Ratio* mencerminkan kemampuan perusahaan mengelola kewajiban jangka pendek, *Total Assets Turnover* menggambarkan efektivitas penggunaan aset, sedangkan *Net Profit Margin* menunjukkan kemampuan perusahaan menghasilkan laba bersih. Ketiga rasio tersebut secara bersama-sama diperkirakan mempengaruhi tingkat *Return on Assets* sebagai indikator profitabilitas perusahaan. Berdasarkan uraian tersebut, hipotesis penelitian dirumuskan sebagai berikut.

H4: *Current Ratio* (CR), *Total Assets Turnover* (TATO), dan *Net Profit Margin* (NPM) secara simultan berpengaruh terhadap *Return on Assets* (ROA) pada PT Nippon Indosari Corpindo Tbk yang terdaftar di Bursa Efek Indonesia.

HASIL DAN PEMBAHASAN

Sebelum melakukan pengujian hipotesis, terlebih dahulu akan dijelaskan data yang akan diolah yaitu mengenai *current ratio, total asset turnover, net profit margin* dan *return on asset* pada PT Nippon Indosari Corpindo Tbk yang dihitung berdasarkan laporan keuangan PT Nippon Indosari Corpindo Tbk dari tahun 2009-2017. current ratio tertinggi pada PT Nippon Indosari Corpindo Tbk terdapat pada tahun 2010 yaitu sebesar 306,69%, sedangkan *current ratio* terendah pada PT Nippon Indosari Corpindo Tbk terdapat pada tahun 2012 yaitu sebesar 112,46%. Sementara itu *total asset turn over* tertinggi pada PT Nippon Indosari Corpindo Tbk terdapat pada tahun 2009 yaitu sebesar 109,88%, sedangkan *total asset turnover* terendah pada PT Nippon Indosari Corpindo Tbk terdapat pada tahun 2017 yaitu sebesar 54,63%.

Sementara untuk *net profit margin* tertinggi pada PT Nippon Indosari Corpindo Tbk terdapat pada tahun 2010 yaitu sebesar 14,74%, sedangkan *net profit margin* terendah pada PT Nippon Indosari Corpindo Tbk terdapat pada tahun 2017 yaitu sebesar 5,43%. Sedangkan untuk return on asset tertinggi pada PT Nippon Indosari Corpindo Tbk terdapat pada tahun 2011 yaitu sebesar 15,27%, sedangkan *return on asset* terendah pada PT Nippon Indosari Corpindo Tbk terdapat pada tahun 2017 yaitu sebesar 2,97%.

Statistik Deskriptif

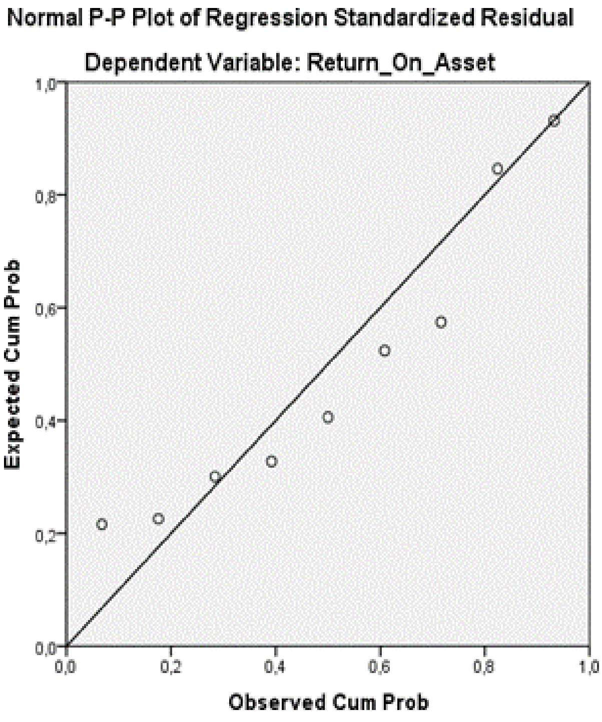
Statistik deskriptif digunakan untuk memberikan gambaran mengenai data setiap variabel penelitian. Statistik deskriptif meliputi nilai minimum, nilai maximum, mean dan standar deviasi. Hasil perhitungan analisis statistik deskriptif Variabel *current ratio* menunjukkan bahwa nilai minimum sebesar 112,46 yang diperoleh pada tahun 2012. Sedangkan nilai maksimum current ratio sebesar 306,69 yang diperoleh pada tahun 2010. Sementara nilai rata-rata (*mean*) untuk variabel *current ratio* dari tahun 2009-2017 sebesar 181,9700 dan Standar deviasi (simpangan baku) *variabel current ratio* sebesar 79,32348.

Variabel total asset turn over menunjukkan bahwa nilai minimum sebesar 54,63 yang diperoleh pada tahun 2017. Sedangkan nilai maksimum *total asset turn over* sebesar 109,88 yang diperoleh pada tahun yang diperoleh pada tahun 2009. Sementara nilai rata-rata (*mean*) untuk variabel *total asset turnover* dari tahun 2009-2017 sebesar 87,9767 dan Standar deviasi (simpangan baku) variabel *total asset turnover* sebesar 16,50919.

Variabel *net profit margin* menunjukkan bahwa nilai minimum sebesar 5,43 yang diperoleh pada tahun 2017. Sedangkan nilai maksimum *net profit margin* sebesar 14,74 yang diperoleh pada tahun 2010. Sementara nilai rata-rata (*mean*) untuk variabel net profit margin dari tahun 2009-2017 sebesar 11,3356 dan Standar deviasi (simpangan baku) variabel *net profit margin* sebesar 2,74192.

Variabel *return on asset* menunjukkan bahwa nilai minimum sebesar 2,97 yang diperoleh pada tahun 2017. Sedangkan nilai maksimum *return on asset* sebesar 15,27 yang diperoleh pada tahun 2011. Sementara nilai rata-rata (mean) untuk variabel *return on asset* dari tahun 2009-2017 sebesar 10,2444 dan Standar deviasi (simpanan baku) variabel *return on asset* sebesar 3,46436.

Uji Asumsi Klasik Uji Normalitas Data



Gambar 1.2 Hasil Uji Normal P-P Plot

Berdasarkan gambar grafik 2.1 P-P Plot standardized reseduall diatas menunjukkan bahwa titik-titik data menyebar disekitar garis normal dan mengikuti arah diagonal. Oleh karena itu dapat disimpulkan bahwa data tersebut terdistribusi secara normal dan layak untuk digunakan.

Berdasarkan pada tabel dimana dalam Uji Kolmogorov Smirnov bahwa nilai Kolmogorov Smirnov lebih besar dari 0,05, dapat dilihat pada tabel 4.3 bahwa nilai sig sebesar 0,919. Maka data dalam penelitian ini terdistribusi secara normal.

Uji Multikolinieritas

Hasil Uji Multikolinearitas

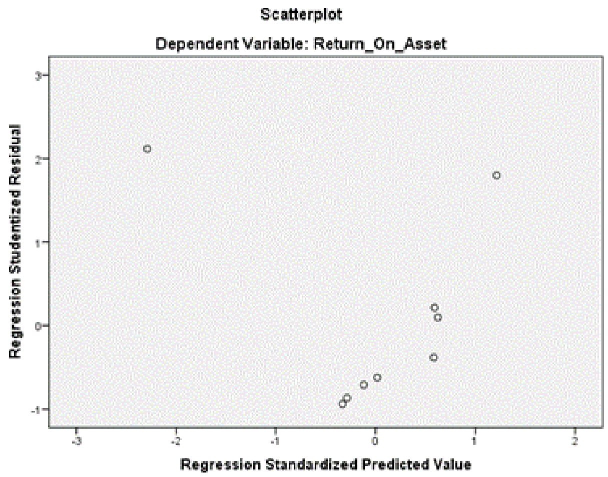
Coefficients

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Current_ratio	,504	1,985
	Total_Asset_Turn_Over	,278	3,601
	Net_Profit_Margin	,369	2,712

a. Dependent Variable: Return_On_Asset Sumber: Data Sekunder

Berdasarkan hasil uji multikolinieritas pada tabel 4.4 menunjukkan bahwa besarnya nilai tolerance yang diperoleh untuk current ratio sebesar 0,504, total asset turn over sebesar 0,278 dan net profit margin sebesar 0,369. Nilai VIF (Variance Inflation Factor) yang diperoleh current ratio sebesar 1,985, total asset turn over sebesar 3,601 dan net profit margin sebesar 2,712. Karena nilai tolerance yang diperoleh untuk setiap variabel lebih besar dari 0,10 dan nilai VIF yang diperoleh untuk setiap variabel lebih kecil dari 10, sehingga dapat disimpulkan bahwa model regresi pada penelitian ini tidak terjadi gejala multikolinearitas.

Uji Heteroskedastisitas



Uji Grafik Scatterplot

Berdasarkan gambar dapat diketahui bahwa data menyebar secara acak diatas maupun dibawah angka 0 pada sumbu Regression Studentized Residual. Oleh karena itu berdasarkan uji heteroskedastisitas yang menggunakan metode analisis grafik, pada model regresi yang terbentuk dinyatakan tidak terjadi gejala heteroskedastisitas.

Berdasarkan tabel 4.5 diatas dapat diketahui bahwa nilai signifikansi untuk variabel current ratio 0,466 > 0,05, nilai signifikan untuk variabel total asset turn over 0,674 > 0,05 dan nilai signifikan untuk variabel net profit margin 0,992 > 0,05. Maka dapat disimpulkan bahwa pada model regresi tidak terjadi gejala heteroskedastisitas.

Uji Autokorelasi

Hasil Uji Runs Test

Runs Test

	Unstandardized Residual
Test Value[a]	-,13776
Cases < Test Value	4
Cases >= Test Value	5
Total Cases	9
Number of Runs	3
Z	-1,406
Asymp. Sig. (2-tailed)	,160

a. Median

Sumber: Data Sekunder

Berdasarkan hasil dari pengujian runs test menunjukkan bahwa besarnya nilai signifikansi yang diperoleh sebesar 0,160 lebih besar dari 0,05, sehingga dapat disimpulkan bahwa model regresi pada penelitian ini tidak terjadi gejala autokorelasi.

Analisis Regresi

Koefisien Determinasi (R-Squares)

Tabel 4.8 Hasil Koefisien Determinasi R-squares

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,991[a]	,983	,972	,57664

a. Predictors: (Constant), Net_Profit_Margin, Current_ratio, Total_Asset_Turn_Over

b. Dependent Variable: Return_On_Asset

Sumber: Data Sekunder Diolah, 2018

Berdasarkan tabel 4.8 dapat diketahui bahwa nilai koefisien determinasi (R-Squares) adalah 0,983, menunjukkan bahwa model kuat, dan berarti bahwa variabel current ratio, total asset *turnover*, dan net profit margin memberikan kontribusi sebesar 98,3% terhadap return on asset di PT Nippon Indosari Corpindo, sementara 1,7% *return on asset* dipengaruhi oleh variabel lain yang tidak ada dalam penelitian ini.

Uji Signifikasi F (Uji F)

Tabel 4.9 Hasil Uji Signifikasi F (Uji F)

ANOVA[a]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	94,352	3	31,451	94,584	,000[b]
	Residual	1,663	5	,333		
	Total	96,014	8			

a. Dependent Variable: Return_On_Asset

b. Predictors: (Constant), Net_Profit_Margin, Current_ratio, Total_Asset_Turn_Over

Sumber: Data Sekunder Diolah, 2018

Berdasarkan tabel 4.9 dapat diketahui bahwa nilai F sebesar 94,584 sementara nilai F tabel sebesar 5,409. Hasil regresi berganda juga menunjukkan bahwa nilai signifikansi sebesar 0,000 lebih kecil dari alpha (0,05). Hasil tersebut menunjukkan bahwa F hitung > F tabel dan nilai signifikansinya lebih kecil dari nilai alpha (0,05). Sehingga dapat disimpulkan bahwa variabel current ratio, total asset turn over dan net profit margin secara simultan berpengaruh positif terhadap return on asset di PT Nippon Indosari Corpindo Tbk.

Uji Signifikansi Parameter t (Uji t)

Tabel 4.10 Hasil Uji Signifikansi Parameter t (Uji t)

Coefficients[a]

Model		Unstandardized Coefficients		t	Sig.
		B	Std. Error		
1	(Constant)	-7,123	1,722	-4,137	,009
	Current_ratio	-,001	,004	-,143	,892
	Total_Asset_ Turn_Over	,101	,023	4,299	,008
	Net_Profit_M argin	,759	,122	6,195	,002

a. Dependent Variable: Return_On_Asset Sumber: Data Sekunder Diolah

Berdasarkan tabel 4.10 maka analisis regresi linear berganda dapat disimpulkan sebagai berikut:

Pengaruh *current ratio* terhadap *return on asset* di PT Nippon Indosari Corpindo Tbk Berdasarkan tabel 4.10 diperoleh t hitung sebesar -0,143 dan nilai t tabel sebesar 2,015 (t hitung < t tabel) dan nilai signifikansi t hitung sebesar 0,892 dan nilai signifikansi t tabel sebesar 0,05 (Sig. t hitung > Sig. t tabel) maka dapat dikatakan bahwa H0 diterima dan HA ditolak, artinya dan HA diterima, artinya total asset *turnover* secara parsial berpengaruh positif dan signifikansi terhadap return on asset.

Pengaruh net profit margin terhadap return on asset di PT Nippon Indosari Corpindo Tbk Berdasarkan tabel 4.10 diperoleh t hitung sebesar 6,195 dan nilai t tabel sebesar 2,015 (t hitung > t tabel) dan nilai signifikansi t hitung sebesar 0,002 dan nilai signifikansi t tabel sebesar 0,05 (Sig. t hitung < Sig. t tabel) maka dapat dikatakan bahwa H0 ditolak dan HA diterima, artinya net profit margin secara parsial berpengaruh positif dan signifikansi terhadap return on asset.

Analisis Regresi Berganda

Berdasarkan hasil persamaan regresi linear berganda yang dibaca adalah nilai dalam kolom β, baris pertama menunjukkan konstanta (α) dan baris selanjutnya menunjukkan koefisien variabel independen. Berdasarkan dari tabel 10 model regresi yang digunakan sebagai berikut:

Y = -7,123 - 0,001X1 + 0,101X2 + 0,759X3 + ε

Nilai konstanta dengan koefisien regresi pada tabel 4.9 dapat dijelaskan sebagai berikut:

1. Konstanta sebesar -7,123 menunjukkan bahwa jika variabel-variabel independen (current ratio, total asset turn over dan net profit margin) diasumsikan tidak mengalami perubahan (tetap atau konstan) maka nilai Y (return on asset) adalah sebesar -7,123
2. Koefisien variabel current ratio (X1) sebesar -0,001. Hal ini menunjukkan bahwa setiap kenaikan current ratio sebesar 1% akan menurunkan return on asset sebesar 0,001% dengan asumsi variabel yang lain tetap atau konstan.

Koefisien variabel total asset turnover (X2) sebesar 0,101. Hal ini menunjukkan bahwa setiap kenaikan total asset turnover sebesar 1% akan menaikkan return on asset sebesar 0,101%.

Koefisien variabel net profit margin (X3) sebesar 0,759. Hal ini menunjukkan bahwa setiap kenaikan net profit margin sebesar 1% akan menaikan return on asset sebesar 0,759%.

KESIMPULAN

Berdasarkan hasil analisis data dan pengujian hipotesis mengenai pengaruh *Current Ratio* (CR), *Total Asset Turnover* (TATO), dan *Net Profit Margin* (NPM) terhadap *Return on Assets* (ROA) pada PT Nippon Indosari Corpindo Tbk, dapat disimpulkan bahwa profitabilitas perusahaan lebih dipengaruhi oleh efektivitas pemanfaatan aset dan kemampuan menghasilkan laba bersih dibandingkan oleh tingkat likuiditas perusahaan.

Secara parsial, *Current Ratio* (CR) menunjukkan pengaruh negatif namun tidak signifikan terhadap *Return on Assets* (ROA). Hasil ini mengindikasikan bahwa perubahan tingkat likuiditas perusahaan tidak secara langsung mempengaruhi kemampuan perusahaan dalam menghasilkan laba dari keseluruhan aset yang dimiliki. Kondisi tersebut menunjukkan bahwa tingginya aset lancar relatif terhadap kewajiban lancar belum tentu mencerminkan penggunaan sumber daya yang produktif. Aset lancar yang terlalu besar bahkan berpotensi menjadi dana menganggur (idle assets) sehingga kurang memberikan kontribusi terhadap peningkatan profitabilitas perusahaan.

Sebaliknya, *Total Asset Turnover* (TATO) terbukti berpengaruh positif dan signifikan terhadap *Return on Assets* (ROA). Temuan ini menunjukkan bahwa semakin tinggi efektivitas perusahaan dalam memanfaatkan seluruh aset untuk menghasilkan penjualan, semakin tinggi pula tingkat pengembalian aset yang diperoleh. Hasil tersebut mendukung teori manajemen keuangan yang menyatakan bahwa efisiensi pemanfaatan aset merupakan salah satu faktor utama dalam meningkatkan profitabilitas perusahaan. Dengan demikian, peningkatan produktivitas aset menjadi strategi penting untuk menciptakan nilai tambah dan meningkatkan kinerja keuangan perusahaan.

Selanjutnya, *Net Profit Margin* (NPM) juga terbukti berpengaruh positif dan signifikan terhadap *Return on Assets* (ROA). Temuan ini mengindikasikan bahwa kemampuan perusahaan dalam menghasilkan laba bersih dari setiap rupiah penjualan memberikan kontribusi yang nyata terhadap peningkatan pengembalian atas aset. Semakin tinggi margin laba bersih yang diperoleh perusahaan, semakin besar kemampuan perusahaan dalam mengoptimalkan aset yang dimiliki untuk menghasilkan keuntungan. Hasil ini memperlihatkan bahwa efisiensi operasional dan pengendalian biaya merupakan faktor penting dalam meningkatkan profitabilitas perusahaan.

Secara keseluruhan, hasil penelitian menunjukkan bahwa *Return on Assets* pada PT Nippon Indosari Corpindo Tbk lebih dipengaruhi oleh rasio aktivitas dan rasio profitabilitas dibandingkan rasio likuiditas. Dengan demikian, perusahaan perlu memfokuskan strategi pengelolaan keuangan pada peningkatan efisiensi penggunaan aset dan optimalisasi laba bersih tanpa mengabaikan kemampuan memenuhi kewajiban jangka pendek. Temuan ini juga memperkuat pandangan bahwa keberhasilan perusahaan dalam meningkatkan profitabilitas tidak hanya ditentukan oleh besarnya sumber daya yang dimiliki, tetapi juga oleh efektivitas dan efisiensi perusahaan dalam mengelola sumber daya tersebut untuk menghasilkan keuntungan.

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FRAUD AS A MODERATING FACTOR IN THE RELATIONSHIP BETWEEN GOOD CORPORATE GOVERNANCE AND FIRM VALUE: EVIDENCE FROM INDONESIAN BANKING

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Abstract: *This study examines the effect of Good Corporate Governance (GCG) mechanisms, profitability, and dividend policy on firm value in Indonesian conventional commercial banks listed on the Indonesia Stock Exchange during 2021–2024, with fraud tested as a potential moderating variable. Two OLS regression models are estimated: Model 1 tests the direct effects of board independence, audit committee, managerial ownership, dividend payout ratio (DPR), and return on assets (ROA) on firm value (PBV) using 168 firm-year observations with logarithmic transformation, while Model 2 introduces fraud as a moderator using 105 observations after IQR-based outlier removal. The results are consistent across both specifications: board independence and ROA positively and significantly influence firm value, while the audit committee exerts a significant negative effect. Managerial ownership is insignificant in Model 1 and excluded from Model 2 due to collinearity, and DPR is insignificant in both models. Fraud, whether included as a direct predictor or through interaction terms, does not significantly moderate the governance–firm value relationship. These findings support agency theory, resource dependence theory, and signaling theory, confirming that profitability and board independence are the dominant determinants of firm value in emerging-market banking. The results carry practical implications for banking regulators and practitioners seeking to enhance firm value through governance enforcement and profitability management.*

Keywords*: Corporate Governance, Fraud, Profitability, Dividend Policy, Firm Value, Emerging Market.*

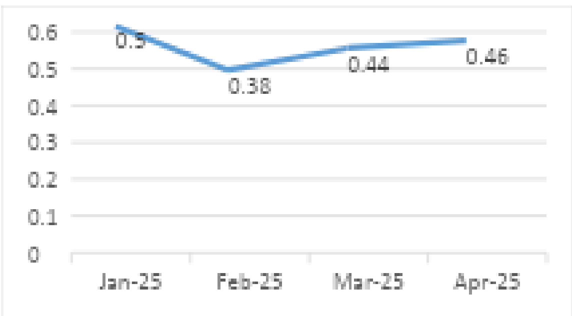
BACKGROUND

Background of The Study

Firm value remains one of the central themes in corporate finance and governance research, as it reflects both the tangible performance of a firm and the intangible perceptions of investors regarding sustainability, profitability, and ethical practices. In emerging markets such as Indonesia, the valuation of commercial banks is particularly crucial given their role as financial intermediaries, mobilizing deposits and allocating credit to productive sectors. The banking industry not only drives financial inclusion but also acts as a barometer of macroeconomic stability. However, the challenge of preserving firm value has become increasingly complex in the face of fraudulent practices, governance weaknesses, and heightened regulatory scrutiny.

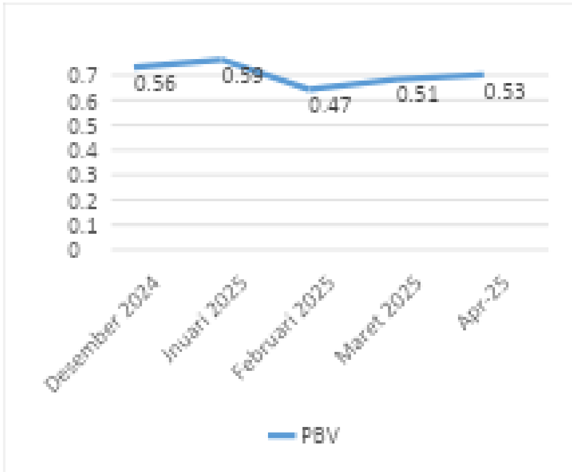
Fraud cases in the Indonesian banking sector—such as embezzlement, fictitious lending, and manipulation of financial statements—have highlighted the vulnerability of governance structures and internal control systems. Various fraud cases within the Indonesian banking sector highlight the vulnerability of corporate governance and internal control systems. For example, a fraudulent fictitious loan case amounting to IDR 569.4 billion occurred in February 2025 at Bank Jatim. The perpetrator's modus operandi involved breaking down the loan into several smaller ones to circumvent strict supervision and evade approval from the board of directors. Even though Bank Jatim had an anti-fraud strategy in place, this case underscores weaknesses in its implementation (Infobanknews, 2025, Kompas, 2025). A similar phenomenon was observed at Bank BJB, where a corruption case involving the markup of advertising funds, allegedly causing state losses of up to IDR 222 billion, drew public attention in March 2025 (Tempo, 2025, n.d.) This incident reinforces the need to strengthen internal control and management oversight as a fundamental component of Good Corporate Governance (GCG) principles. Collectively, these cases emphasize the urgency of re-evaluating and reinforcing banking systems to prevent future financial and reputational losses.

These incidents not only erode profitability but also undermine stakeholder trust, leading to declines in market valuation. At the same time, firm value is influenced by dividend policy and profitability, which are closely monitored by investors as signals of corporate health (Gordon, 1963; Lintner, 1962). Dividend policy demonstrates management's confidence in future earnings, while profitability—often measured by Return on Assets (ROA)—reflects operational efficiency and financial resilience (Alfianita & Santosa, 2022).



Graph 1. PBV of Bank Jabar Banten in Q1 2025

In January 2025, the Price-to-Book Value (PBV) was recorded at 0.50, but it experienced a sharp decline to 0.38 in February 2025. This significant decrease likely reflects market concerns regarding the credibility and corporate governance of the institution. Although a modest recovery was observed in March and April, with PBV rising to 0.44 and 0.46 respectively, the value did not return to its initial level. This trend suggests that investors' negative perception of poor Good Corporate Governance (GCG) can directly impact market valuation and firm value within the banking sector.



Graph 2. PBV of Bank Jatim in Q1 2025

The role of Good Corporate Governance (GCG) is particularly significant in the Indonesian context. Regulatory bodies such as the Financial Services Authority (OJK) emphasize the implementation of GCG principles—including transparency, accountability, responsibility, independence, and fairness—as mechanisms to prevent fraud and safeguard stakeholders' interests (OECD, 2023; Putri & Putri, 2022). Prior studies suggest that board independence, audit committees, and managerial ownership positively contribute to firm value by enhancing monitoring and reducing agency conflicts (Hadisurya et al., 2025; Tumewang et al., 2025) Studies from (Darmawan et al., 2020; Putri & Putri, 2022) emphasize that board independence and audit committees strengthen monitoring effectiveness, thereby contributing positively to firm value in Indonesian banks. Yet, despite regulatory emphasis, the persistence of fraud scandals reveals gaps in enforcement and effectiveness.

This study, therefore, examines the nexus between fraudulent practices, dividend policy, profitability, and GCG in determining firm value among Indonesian commercial banks listed on the Indonesia Stock Exchange (IDX) from 2021–2023. By focusing on this critical sector, the study provides empirical evidence relevant to both academic debates and practical policymaking. It contributes to the literature by addressing how the interaction of governance and financial performance in shaping firm value.

LITERATURE REVIEW

Agency Theory

Jensen & Meckling, (1979) describe agency relationships as contracts where shareholders (principals) delegate decision-making authority to managers (agents). In banking, this often leads to conflicts of interest due to information asymmetry. Fraudulent practices emerge when monitoring is weak and managers exploit resources for personal benefit. Strong governance mechanisms reduce agency costs by aligning managerial incentives with shareholder wealth (Irhamni, 2024). Institutional theory underlines the impact of regulatory and cultural environments on governance outcomes. In Indonesia, GCG adoption is often more symbolic than substantive (Patricia Sumar & Dwi Ratmono, 2024). Meanwhile, asymmetric information theory highlights how fraud exploits informational imbalances, reducing the credibility of financial signals (Njoku & Lee, 2024).

Fraud represents the most extreme manifestation of the agency problem. When monitoring is weak, managers may exploit resources for personal benefit, fabricate financial results, or conceal risk exposures—all of which erode shareholder value (Patricia Sumar & Dwi Ratmono, 2024). From this perspective, fraud is not merely a control variable but a contingency that may alter how governance mechanisms affect firm value. In a fraud-free environment, independent directors and audit committees function as preventive monitors; their presence reassures investors and reduces the cost of equity. In a fraud-exposed environment, however, two competing dynamics arise. On one hand, governance mechanisms may prove resilient—detecting and containing fraud before it destroys value. On the other hand, fraud may undermine investor confidence in the governance apparatus itself, rendering board independence or audit oversight less credible as signals of quality. This theoretical ambiguity motivates the inclusion of fraud as a moderating variable rather than a direct predictor: the question is not simply whether fraud reduces firm value, but whether fraud changes the channel through which governance mechanisms influence value.

Signaling Theory

Spence, 1978 argues that firms use financial policies to signal private information to the market. Dividend payments, for instance, serve as signals of profitability and future earnings stability. Profitability indicators such as ROA similarly function as market signals, reassuring investors about operational efficiency. Governance disclosures can also reduce uncertainty by signaling compliance and transparency (Bergh et al., 2018). Fraud disrupts this signaling equilibrium. When a bank is exposed to fraud, the credibility of its financial signals deteriorates: reported profitability may be overstated, dividend payments may mask underlying weaknesses, and governance disclosures may reflect symbolic rather than substantive practices. Investors who learn of fraud exposure may discount all signals emanating from the firm, regardless of their actual accuracy.

Njoku and Lee (2024) note that asymmetric information theory highlights how fraud exploits informational imbalances, reducing the credibility of financial signals. This mechanism suggests that fraud could moderate the relationship between profitability (or dividend policy) and firm value: high ROA or stable dividends may boost valuation under normal conditions but lose their signaling power when the bank's integrity is questioned.

Resource Dependence Theory

While agency theory emphasizes the monitoring function of independent directors, resource dependence theory (Pfeffer & Salancik, 1978) offers a complementary perspective: boards serve not only as monitors but as conduits of valuable resources. Independent commissioners bring external expertise, professional networks, industry knowledge, and institutional legitimacy to bank governance. These resources improve the quality of strategic decision-making, facilitate access to capital markets, and strengthen the bank's relationships with regulators and external stakeholders.

In the Indonesian banking context, where regulatory complexity is high and institutional trust is still developing, the resource provision function of independent directors may be particularly important. A board composed of genuinely independent commissioners can bridge the gap between bank management and the external environment, providing advice on risk management, regulatory compliance, and strategic positioning that executives with internal perspectives alone may lack. Resource dependence theory thus predicts that board independence enhances firm value not only by reducing agency costs (the agency theory channel) but also by enriching the bank's resource base and adaptive capacity.

Good Corporate Governance (GCG)

GCG serves as a safeguard against managerial opportunism and fraudulent behavior. The Board Independence is expected to provide unbiased oversight, while audit committees strengthen the reliability of financial statements. Managerial ownership aligns the interests of managers and shareholders, potentially discouraging opportunistic fraud (Putri & Putri, 2022). However, the effectiveness of these mechanisms varies across institutional settings. Studies highlight that in Indonesian banks, governance structures are often symbolic rather than substantive, with audit committees lacking sufficient enforcement capacity (Darmawan et al., 2020; Hadisurya et al., 2025; Tumewang et al., 2025).

Dividend Policy

Dividend policy remains contested in the finance literature. The Miller & Modigliani, 1961 irrelevance theory suggests that dividends do not affect firm value under perfect market assumptions, while the bird-in-hand theory Gordon, (1963); Lintner, (1962) argues that investors prefer certain dividends over uncertain capital gains. Empirical research also supports this link, where stable dividend payouts were found to positively influence valuation in Indonesian listed firms (Wardhana & Tandelilin, 2018).

Profitability

Profitability is a fundamental determinant of firm value. In the banking sector, ROA is widely used to assess management's ability to generate income from assets. Higher profitability generally correlates with higher market valuations, as investors interpret it as a sign of sustainable growth (Yoda et al., 2023). Nonetheless, profitability's impact can be mitigated by external shocks or governance failures, as seen in several Indonesian fraud cases where strong financial results failed to maintain investor trust. In this research, GCG is measured using three indicators:

a. Board Independence: A proportion of the board of commissioners who have no affiliation with company owners or management. They play a crucial role in objective supervision to prevent the abuse of authority and improve governance quality.

$$\text{Board Independence (KI)} = \frac{\textit{The number of independent commissioners}}{\textit{Total number of commissioners}} \quad (1)$$

b. Audit Committee: A committee formed by the board of commissioners to oversee financial reporting, audits, and internal controls. The number of members is used as the indicator. An effective audit committee enhances financial report quality and reduces information asymmetry.

Audit committee = the number of audit committee members (2)

c. Managerial Ownership: The percentage of shares held by company management. A higher proportion is expected to align the interests of managers with shareholders, thereby reducing agency conflicts and increasing firm value.

d. Managerial Ownership =

$$\frac{\textit{the percentage of shares owned by managers}}{\textit{total outstanding shares}} \quad (3)$$

Dividend Policy refers to a company's decision on distributing profits to shareholders or retaining them for future investment. Classical theories suggest irrelevance (Modigliani & Miller, 1958), while the bird-in-the-hand argument (Gordon, 1963; Lintner, 1962), views dividends as reducing uncertainty. According to Brigham & Houston, (2021), it involves the decision on the percentage of net profit paid out, known as the Dividend Payout Ratio (DPR), a consistent dividend policy is often seen as a signal of a company's stable finances and good management, which can influence stock prices and investor perception. A high DPR indicates a strategy of distributing profits to shareholders, which can lead to a rise in stock price. While a high DPR benefits investors, a low DPR strengthens the company's finances. This research uses DPR as the sole proxy for dividend policy. Key theories underpinning dividend policy include:

a. Dividend Irrelevance Theory: Developed by Merton Miller & Franco Modigliani (1961) this theory argues that a company's value is determined only by its earnings and business risk.
b. Bird-In-The-Hand Theory: Myro Gordon, 1963; John Lintner, 1962 argued that investors prefer high dividends because they are more certain and less risky than potential capital gains.
c. Tax Preference Theory: Brigham & Houston (2021) explain that investors may prefer low dividends to avoid higher tax burdens, as capital gains from

profit growth are often taxed at a lower rate.

Empirical studies in Indonesia, including Wardhana & Tandelilin (2018); Yoda et al. (2023); Yuwono & Aurelia (2021) confirm that stable dividends enhance firm valuation. Nonetheless, international evidence suggests contextual variations: in highly regulated banking sectors, excessive payouts may undermine capital adequacy (H. N. Dang et al., 2021)

Profitability is a company's ability to generate profit over a specific period from its sales, assets, or equity. It is a critical indicator of management's effectiveness in utilizing resources to generate revenue and profit. This study uses Return on Assets (ROA) as the primary proxy for profitability. ROA measures how much net income is generated per dollar of total assets, reflecting the company's efficiency in using its assets to generate profit. Studies in Indonesia, Silfia et al. (2022); Yoda et al.,(2023) affirm this relationship. Yet, profitability as a signal is vulnerable to manipulation: fraud cases where banks overstated earnings reveal that investors may discount reported profitability when governance credibility. According to Maulani & Riani (2021), a higher ROA indicates greater net profit from total assets, while a negative ROA signifies a loss. ROA is calculated as follows:

$$\text{ROA} = \frac{\textit{Profit before tax}}{\textit{Average of total asset}} \times 100\% \quad (4)$$

Firm Value represents investors' perception of a company's success and is often reflected in its stock price. A high stock price indicates high firm value, attracting more investors and building confidence in the company's management and future prospects. Fraud introduces a disruptive force into the governance–performance–value nexus. Research demonstrates that fraud incidents significantly undermine investor confidence and diminish firm valuation (Park, 2022; Seifzadeh et al., 2021; Ye & Hu, 2025). While agency theory anticipates opportunistic behavior, few empirical studies systematically explore fraud's moderating effect. This gap is particularly evident in Indonesian scholarship, where most research focuses on GCG or profitability in isolation rather than their interaction with fraud.

Sustained growth in firm value is considered a significant achievement as it enhances shareholder wealth. This study uses the Price to Book Value (PBV) ratio as a proxy for firm value, which is a comparison between the market price per share and the book value per share. A higher PBV indicates that a company effectively manages investor funds to generate high returns. PBV is calculated as follows:

$$\text{PBV} = \frac{\textit{Market price per share}}{\textit{Book value per share}} \quad (5)$$

The reviewed literature reveals several insights: (1) profitability and dividends are key drivers of firm value, but their effectiveness depends on credibility; (2) GCG mechanisms provide oversight yet are often symbolic in practice; (3) fraud undermines both signaling and governance functions, but remains underexplored as a moderating factor. Previous research on the relationship between Good Corporate Governance (GCG), dividend policy, profitability, and firm value has yielded varied results, often influenced by the specific market and industry context. A study by Giang Tra Thi Dang et al., n.d. (2023) in Vietnam, for instance, found a positive impact of GCG on firm value, which aligns with Agency Theory. Similarly, multiple studies focusing on the Indonesian market, such as those by (Yoda et al., 2023) and Alfianita & Perdana

Wahyu Santosa (2022), consistently identified a significant positive effect of profitability on firm value. These findings provide a robust theoretical foundation for the present study, underscoring the importance of profitability as a signal of financial health and GCG as a governance mechanism.

However, several studies have reported different findings that are particularly relevant to this research. Njoku & Lee (2024) for example, found that cash dividends positively affect firm value in the Korean market, while Thauziad & Kholmi (2021) and Putri & Putri (2022) found that certain GCG proxies, like managerial ownership and the audit committee, did not have a significant impact on firm value. These contradictory results highlight a gap in the literature and the need for further investigation within the specific context of the Indonesian banking sector, given its unique characteristics and regulatory framework. Therefore, this study aims to bridge this gap by comprehensively analyzing how GCG, dividend policy, and profitability collectively and individually influence the firm value of Indonesian commercial banks.

Research Hypotheses

This study addresses that gap by pursuing two objectives. The first objective is to determine the direct effects of GCG mechanisms (board independence, audit committee, managerial ownership, and dividend payout ratio) and financial performance (return on assets) on firm value (price-to-book value) in Indonesian conventional commercial banks over the 2021–2024 period. The second objective is to examine whether fraud moderates the relationship between these governance mechanisms and firm value.

Based on the theoretical foundation and previous empirical research, the following hypotheses are proposed:

1. Good Corporate Governance on Firm Value

According to agency theory, effective corporate governance mechanisms are essential in mitigating conflicts of interest between management and shareholders, thereby enhancing investor confidence and increasing firm value as reflected in stock prices and the Price to Book Value (P/BV) ratio. Corporate governance in this context is assessed through three key indicators. First, the Board Independence serves as an oversight body that ensures objective decision-making and minimizes actions detrimental to shareholders. Second, the audit committee plays a critical role in monitoring financial reporting, ensuring transparency, and strengthening accountability. Third, managerial ownership aligns the interests of management with those of shareholders, thereby fostering value creation. Empirical studies support these relationships, demonstrating that the Board Independence (Alves, 2023; Putri & Putri, 2022), audit committees (Fariha et al., 2022; Hezabr et al., 2023; Putry & Murni, 2022) , and managerial ownership (Ben Fatma & Chouaibi, 2023; Nurhalisah & Trisnaningsih, 2024; Thauziad & Kholmi, 2021) each exerts a significant positive influence on firm value. In line with Al Amosh & Khatib (2022) Managerial ownership has a significant negative impact on ESG disclosure that affects the firm's value. This study measures GCG through three indicators:

H1a: Board Independence has a significant effect on firm value.

H1b: The audit committee has a significant effect on firm value.

H1c: Managerial ownership has a significant effect on firm value.

2. Dividend Policy on Firm Value

Dividend policy represents a strategic corporate decision concerning the allocation of earnings between dividend distribution to shareholders and retained earnings for future investment. The Bird in the Hand theory Gordon (1963) posits that investors place greater value on current dividends than on uncertain future capital gains, as dividends provide immediate and more predictable returns. Firms that consistently distribute dividends thereby offer income certainty, which enhances investor interest and subsequently increases firm value. From the perspective of agency theory, dividend distribution also functions as a mechanism to mitigate agency conflicts. By reducing the amount of free cash flow under managerial control, dividend payments limit the potential for managerial opportunism, thereby strengthening shareholder trust and enhancing firm value. Empirical studies support this theoretical foundation, with evidence showing that dividend policy positively influences firm value (Eryomin et al., 2021; Hung et al., 2018; Kapons et al., 2023; Kusumawati et al., 2021; Seth & Mahenthiran, 2022a):

H2: Dividend policy has a significant effect on firm value.

3. Profitability on Firm Value

A high level of profitability indicates a company's ability to generate earnings, which can be reinvested or distributed to shareholders. According to Signaling Theory, high profitability is a positive signal for investors. From an Agency Theory perspective, high profitability reflects good managerial performance, which reduces conflicts between management and owners. Empirical studies support this theoretical foundation, with evidence showing that profitability positively influences firm value Eryomin et al., (2021) Alfianita & Perdana Wahyu Santosa, (2022; Dang et al., (2021); Fadilah & Febrianti, (2024); Thauziad & Kholmi, (2021), and Fadilah & Febrianti, (2024). However, contradicts to Kusumawati et al., (2021).

H3: Profitability has a significant effect on firm value.

4. The Simultaneous Effect of Variables on Firm Value

GCG, dividend policy, and profitability are all crucial factors that influence firm value. Sound GCG signals transparency and accountability, increasing investor confidence and reducing risk. A stable dividend policy signals a company's ability to consistently generate and distribute profits, while high profitability shows its ability to create long-term value. When these three factors work together, they are expected to significantly enhance investor appeal and firm value.

H4: GCG, dividend policy, and profitability simultaneously have a significant effect on firm value

5. Fraud as a moderator variable

GCG increases PBV partly by improving the credibility of financial reports and management signals; if a firm is subject to financial fraud (or perceived as fraud-prone), investor trust collapses and the market discounts any governance signals — reducing the valuation premium that GCG would otherwise generate. Fraud increases information asymmetry and hides the true quality of governance or makes governance appear ineffective (Junus et al., 2025). When information asymmetry rises, the market cannot reward governance improvements because it cannot verify them; agency-cost theory explains why governance only raises value when it credibly reduces managerial opportunism (Jensen & Meckling, 1979). If a firm is associated with fraud (or weak accounting integrity), investors will discount dividend signals — they may suspect dividends are being paid from manipulated earnings or one-off items — so the signaling effect on PBV is weakened (Tanushev, 2020).

H5: Fraud has a significant moderating effect on the relationship between GCG and firm value, and on the relationship between dividend policy and firm value.

METHODOLOGY

This study applies a quantitative approach using panel data to explore the influence of dividend policy, profitability, and Good Corporate Governance (GCG) on firm value. The research adopts a panel data framework covering 42 conventional commercial banks listed on the Indonesia Stock Exchange (IDX) over the 2021–2024 period, yielding 168 firm-year observations (42 banks × 4 years). Two regression models are estimated sequentially: Model 1 examines the direct effects of GCG mechanisms, profitability (ROA), and dividend policy (DPR) on firm value (PBV), while Model 2 extends the analysis by introducing fraud as a moderating variable through interaction terms.

Data Sources

The dataset was constructed from multiple secondary sources:

1. Annual reports and financial statements published by banks.
2. Corporate Governance disclosures mandated by the Financial Services Authority (OJK).
3. IDX publications and filings for dividend distributions and market valuation.
4. Fraud events documented through OJK reports and credible financial news outlets such as Kontan and Tempo.

This study applies a quantitative approach using panel data to explore the influence of dividend policy, profitability, and Good Corporate Governance (GCG) on firm value. The research population comprises commercial banks listed on the Indonesia Stock Exchange (IDX) during 2021–2024. A purposive sampling technique was used to select banks that consistently disclosed annual financial statements, governance reports, and dividend distributions, and for which reliable information on fraud incidents could be obtained.

Variable Definitions

1. Firm Value (Dependent Variable): Measured by Price-to-Book Value (PBV), reflecting the ratio of market value to book equity.
2. Independent Variables:
3. Dividend Policy: Dividend Payout Ratio (DPR), calculated as total dividends divided by net income.
4. Profitability: Return on Assets (ROA), defined as net income to total assets.
5. GCG Indicators:
   a. (i) Proportion of Board Independence,
   b. (ii) Existence and size of audit committees,
   c. (iii) Managerial ownership.
6. Fraud as a moderator variable in model 2. a binary variable (1 = the bank received regulatory sanctions, financial restatements, or reported fraud incidents in a given year; 0 = otherwise).

Econometric Model

Our panel regression, applying Multiple Linear Regression Analysis, was chosen after the classical assumption test was confirmed.

The regression analysis employed a model that passed the classical assumption tests: normality, multicollinearity, autocorrelation, and heteroscedasticity. In model 1, the initial normality test using Kolmogorov-Smirnov showed that the data were not normally distributed, leading to a natural logarithmic (LN) transformation of the variables PBV, ROA, and Audit Committee. The analysis proceeds in two stages, each addressing a distinct research question. Model 1 tests the direct effects of GCG mechanisms, ROA, and DPR on PBV without the fraud variable. Model 2 extends this by incorporating fraud as a moderator through interaction terms (Board_Independence×Fraud, Audit_Committee×Fraud, Managerial_Ownership×Fraud, DPR×Fraud). Because each model faced different distributional challenges in its residuals, the data treatment strategies differ between the two stages, as described below.

The baseline model is specified as:

Model 1: Direct Effects (N = 168)

Model 1 retains all 168 firm-year observations. An initial ordinary least squares (OLS) estimation revealed that the unstandardized residuals violated the normality assumption, as indicated by the Kolmogorov-Smirnov test (test statistic = 0.262, Asymp. Sig. = 0.000). To address this, a natural logarithm (LN) transformation was applied to three variables that exhibited pronounced right-skewness: PBV, Audit Committee (AC), and Managerial Ownership (MO). The remaining variables (Board Independence, DPR, and ROA) were left in their original scale because their distributions were approximately symmetric.

Model 1:

PBV_it= β0 + β1BI_it + β2AC_it + β3MO_it + β4DPR_it + β5ROA_it + it

After transformation, the Kolmogorov-Smirnov test yielded an Asymptotic Significance of 0.012. Because the Lilliefors correction can be overly conservative at larger sample sizes, a Monte Carlo simulation (10,000 replications, starting seed = 926214481) was conducted, producing a Monte Carlo Significance of 0.226 (99% CI: 0.216–0.237). This value comfortably exceeds the 0.05 threshold, confirming that the residuals of the transformed model satisfy the normality assumption.

The transformed Model 1 specification is:

$LN\_PBV = a + \beta_1\ Board\_Independence + \beta_2\ LN\_AC + \beta_3\ LN\_MO + \beta_4\ DPR + \beta_5\ ROA + \varepsilon$

Classical assumption tests on the transformed model confirmed that multicollinearity was absent (all VIF values below 2.0: Board Independence = 1.075, Audit Committee = 1.369, Managerial Ownership = 1.050, DPR = 1.631, ROA = 1.292). The Glejser test indicated no heteroscedasticity, with all independent variables producing significance values above 0.05 (Board Independence = 0.098, Audit Committee = 0.637, Managerial Ownership = 0.183, DPR = 0.676, ROA = 0.300). The Durbin-Watson statistic was 1.007, suggesting potential positive autocorrelation; however, given that this study uses panel data with a cross-sectional dominant structure (42 banks, 4 years), low DW values are common and do not necessarily indicate model misspecification.

Model 2

In model 2 Moderating Effects of Fraud (N = 105), we involved Fraud as a moderating variable to see how Fraud's role impacts can quantify its interaction effect on the relationships between GCG, mechanism, and firm value. Because the interaction terms (e.g., Board_Independence×Fraud) create products between continuous and binary variables, applying a logarithmic transformation to the constituent variables would distort the multiplicative interaction structure. The study therefore adopted an alternative strategy: outlier removal using the Interquartile Range (IQR) method.

Outliers were identified across six continuous variables: PBV, ROA, Board Independence, Audit Committee, Managerial Ownership, and DPR. For each variable, the first quartile (Q1) and third quartile (Q3) were computed, the IQR was calculated as Q3 – Q1, and observations falling below Q1 – 1.5×IQR or above Q3 + 1.5×IQR were flagged. Any observation that qualified as an outlier on at least one of the six variables was removed. This process identified 63 outlier observations, reducing the sample from 168 to 105 firm-year observations.

One additional adjustment was necessary. After outlier removal, the interaction term Managerial_Ownership×Fraud produced undefined (NaN) coefficients due to perfect collinearity: in the cleaned subset, all observations with non-zero managerial ownership had Fraud = 0, eliminating the variation needed to estimate the interaction. Managerial Ownership and its interaction term were therefore excluded from Model 2. The final specification is:

$$PBV = \alpha + \beta_1 BI + \beta_2 AC + \beta_3 DPR + \beta_4 ROA + \beta_5 Fraud + \beta_6 BI\times Fraud + \beta_7 AC\times Fraud + \beta_8 DPR\times Fraud + \varepsilon$$

Y = Firm value

α = intercept of the model

β_1, β_2, β_3, β4, β5 = regression coefficient in each variable

BI = Board Independence

AC = Audit committee

MO = Managerial Ownership

DPR = Dividend Payout Ratio

ROA = Return on Assets

ϵit= Standard error (error term in regression model)

Multicollinearity diagnostics on the cleaned data confirmed acceptable VIF values for all retained variables (Board Independence = 1.090, Audit Committee = 1.432, DPR = 1.714, ROA = 1.265, Fraud = 1.107). The model yielded $R^2 = 0.310$ (Adj. $R^2 = 0.253$) with a significant F-statistic of 5.394 ($p < 0.001$), indicating that the overall model is statistically meaningful.

RESEARCH FINDINGS AND DISCUSSIONS

Descriptive Statistics

Table 1. Descriptive Statistics

	N	Min	Max	Mean	Std. Deviation
BI	168	0.250	1.000	0.57338	0.109381
Audit	168	2.000	8.000	3.73214	1.201163
Man Own	168	0.000	0.432	0.00793	0.049699
DPR	168	0.000	0.859	0.17143	0.251501
ROA	168	-0.137	0.058	0.01177	0.024299
PBV	168	0.142	35.472	1.98253	3.658222
Valid N (Listwise)	168				

Source: Author's calculations using SPSS

The Board Independence variable has a mean of 0.574, indicating that, on average, Board Independence makes up approximately 57.4% of the board. The minimum value of 0.250 occurred at Bank Bumi Artha in 2021, while the maximum value of 1.000 was recorded at Bank Victoria in 2021 and 2022. For the Audit Committee variable, the average number of members is 3.73, with a range from 2 to 8. The minimum value was observed at Bank MNC Internasional (2021-2023), Bank of India Indonesia (2021), Bank China Construction (2023), and Bank Pembangunan Daerah Banten (2021-2023). The maximum value was found at Bank Rakyat Indonesia in 2021.

Managerial Ownership has a very low mean of 0.008 and a maximum of 0.432, indicating minimal ownership by management. The maximum value was observed at Bank Mayapada in 2023. The Dividend Payout Ratio (DPR) has an average of 0.171. Its maximum value of 0.859 occurred at Bank Rakyat Indonesia in 2021. The Return on Assets (ROA) variable has a mean of 0.011, with a minimum of -0.137 (Bank Neo Commerce, 2021) and a maximum of 0.058 (Krom Bank Indonesia, 2021). Finally, the dependent variable, Price to Book Value (PBV), shows a large standard deviation (3.658).

Classical Assumption Test

Normality Test: The Kolmogorov-Smirnov test resulted in an Asymp. Sig. (2-tailed) value of 0.012, which is below the 0.05 threshold, indicating the data are not normally distributed. However, the Monte Carlo method was then used, which showed a significance value of 0.226, exceeding the 0.05 threshold and confirming that the residuals are normally distributed.

Table 2. Normality test

			Unstandardized Residual
N			168
Normal Parameters[a,b]	Mean		.0000000
	Std. Deviation		.83917171
Most Extreme Differences	Absolute		.079
	Positive		. 079
	Negative		-.060
Test Statistik			.079
Asymp. Sig. (2-tailed)			.012[c]
Monte Carlo Sig. (2-tailed)	Sig.		.226[d]
	99% Confidence Interval	Lower Bound	.216
		Upper Bound	.237

Source: Author's calculations using SPSS

Multicollinearity Test: All independent variables had tolerance values above 0.10 and Variance Inflation Factor (VIF) values below 10, indicating that the regression model is free from multicollinearity issues. For example, the tolerance value for the Board Independence was 1.08978 (VIF: 1.103), and for ROA it was 0.790 (VIF: 1.266).

Table 3. VIF Results

Independent Var.	VIF
BI	1.103
AC	1.39
Man Own	1.061
DPR	1.633
ROA	1.266

Source: Author's calculations using SPSS

Heteroscedasticity Test: Based on the Glejser method, all independent variables showed significance values with Monte Carlo Sig. (2-tailed) showed a value of 0.169, greater than 0.05. This confirms that the regression model does not exhibit symptoms of heteroscedasticity.

Table 4. Heteroscedasticity test

Independent Var.	Sig.
BI	0.098
AC	0.637
Man Own	0.183
DPR	0.676
ROA	0.300

Source: Author's calculations using SPSS

Autocorrelation Test: The Durbin-Watson value was 1.007, which falls within the acceptable range of -2 to +2. This indicates that the regression model is free from autocorrelation, satisfying the assumption of residual independence.

Model 1 results

PBV (Y) = –0.336 + 1.842 BI – 0.510 LN_AC – 2.579 LN_MO + 0.060 DPR + 6.481 ROA+ ε

Table 5. ***OLS Regression Results — Model 1 (Dependent Variable: LN_PBV, N = 168)***

Variable	B	Std. Err.	Beta	t	Sig.
(Constant)	–0.336	0.420		–0.800	0.425
BI	1.842	0.607	0.236	3.034	**0.003***
LN_AC	–0.510	0.252	–0.177	–2.023	**0.045**
LN_MO	–2.579	1.557	–0.127	–1.657	0.100
DPR	0.060	0.321	0.018	0.188	0.851
ROA	6.481	2.925	0.185	2.216	**0.028**

Source: Author's calculations using SPSS

Table 6. Coefficient of Determination test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.34[a]	.116	.088	0.81622

Table 7. Result F-test

Regression Model	F	Sig.	Number of obs
Regression	4.206	0,001	168

***p < 0.01, **p < 0.05, *p < 0.10*

Source: Author's calculations using SPSS

Model 2 results

Table 8. Coefficient of Determination test

R-squared:	Adj. R-squared:	F-statistic:	Prob (F-statistic):
0.31	0.253	5.394	1.30E-05

Source: Author's calculations using Python statsmodels.

Table 9. OLS Regression Results — Model 2 (Dependent Variable: PBV)

Variable	Coef.	Std. Err.	t	p-value	Sig.
Intercept	0.191	0.411	0.464	0.644	
Board Independence	2.308	0.734	3.146	0.002	***
Audit Committee	–0.193	0.089	–2.183	0.031	**
DPR	–0.708	0.453	–1.563	0.121	
ROA	27.988	6.985	4.007	0.000	***
Fraud	–1.057	1.363	–0.775	0.440	
BI × Fraud	2.890	2.283	1.266	0.209	
AC × Fraud	–0.181	0.194	–0.932	0.354	
DPR × Fraud	1.059	0.719	1.473	0.144	
R^2 = 0.310; Adj. R^2 = 0.253; F = 5.394 (p < 0.001); N = 105					

*Note: *** p < 0.01, ** p < 0.05, * p < 0.10.*

Source: Author's calculations using Python statsmodels.

Model 2 results

PBV = 0.191 + 2.308 BI – 0.193 AC – 0.708 DPR + 27.988 ROA – 1.057 Fraud + 2.890 BI×Fraud – 0.181 AC×Fraud + 1.059 DPR×Fraud

The findings confirm that simultaneously profitability, dividend policy, and Good Corporate Governance (GCG) mechanisms significantly influence the firm value of Indonesian commercial banks. Regardless of direct or moderating influence, the fraud remains significantly irrelevant in the relationships, with none of the interaction terms proving relevant, and with the main component of fraud also being inconsequential.

The results underscore the importance of GCG mechanisms, particularly the roles of the Board Independence and audit committees. These governance structures significantly enhance firm value, consistent with agency theory (Jensen & Meckling, 1979), and supported by Indonesian evidence (Putri & Putri, 2022; Putry & Murni, 2022; Thauziad & Kholmi, 2021). In H1a, the findings reveal that the Board Independence has a significant effect on Firm Value (PBV). This is supported by a significance value of 0.003 in Model 1 and 0.002 in Model 2, which is lower than the $\alpha = 0.05$ threshold. This suggests that the quantitative proportion of the Board Independence is a strong positive signal for investors in forming a perception of firm value.

Having a greater percentage of the Board Independence on a bank's board typically leads to a higher firm value, which can be seen in a higher Price to Book Value (PBV) ratio. This is because these commissioners have important oversight responsibilities, especially regarding decisions that involve spending public funds, which are important and especially risky in this highly regulated sector. There is a relationship that can be explained in two ways. Firstly, in signaling theory, the Board Independence members signal to entities that a bank practices transparency and accountability, which increases confidence in the market, effectively increasing the bank's stock value. Secondly, in Agency Theory, Board Independence members protect shareholders by conflict of interest mitigation, ensuring that management acts in the interests of the shareholders, and therefore protecting their investments.

The constraints of information, the domineering influence of management, or the little knowledge of the bank's detailed industry may lead to ineffectiveness. If the market perceives the Board Independence as not credible evidence of the enhancement of transparency and value-adding resolutions, then there will be no favorable response in regard to the stock price. This aligns with the arguments of Alves, (2023); Permana et al., (2024); Putri & Putri, (2022) with regard to the positive impact of good corporate governance on firm value. Conversely, this study contradicts the findings of Amaliyah & Herwiyanti, (2019); Ben Fatma & Chouaibi, (2023); Faradilla Purwaningrum & Haryati, (2022); Ferriswara et al., (2022) found that some aspects of corporate governance do not always have a significant effect on firm value. Such contrast may be attributed to the used proxies, periods, or even industry sectors in the respective studies.

The hypothesis 1b test results show that the audit committee has a significant effect on firm value. This is evidenced by a t-statistic of -2.023 and a significance value of 0.045 in Model 1 and 0.031 in Model 2, which is less than the $\alpha = 0.05$ threshold. This finding supports the acceptance of the hypothesis that a significant effect exists. This supports the hypothesis that a significant effect exists. This aligns with Agency Theory, which states that the Audit Committee acts as a key monitoring entity to alleviate interest conflicts between management (agents) and the owners (principals) of the company. The negative correlation implies several reasons. First, a larger audit committee may signal existing governance problems: banks facing regulatory scrutiny or internal control weaknesses may expand their committees reactively, and the market may interpret this expansion as a symptom rather than a cure (Altin, 2024). Second, coordination costs increase with committee size; beyond a threshold, additional members may slow decision-making and dilute individual accountability without proportionally improving oversight quality.

This finding does not imply that audit committees are harmful. Rather, it suggests that in Indonesian banking, the quantity of committee members matters less than the effectiveness and independence of their monitoring function. Regulators and practitioners should focus on audit committee competence, meeting frequency, and financial expertise rather than on numerical expansion.

Empirical data from several commercial banks in this study's sample support this finding. Bank CIMB Niaga, for instance, raised the count of Audit Committee members from 3 in 2021 to 6 in 2023. Simultaneously with this rise, its firm value increased from 0.55 to 0.86. Likewise, Bank of India Indonesia saw a rise in firm value from 1.20 to 1.35 following an expansion in its audit committee size. This information indicates that a bigger audit committee size is linked to an increased firm value. The study's findings are in line with those of studies by Purwaningrum & Haryati, (2022); Fariha et al., (2022); Hezabr et al., 2023; Putry & Murni, (2022); Solikah et al., (2020), which discovered that the audit committee significantly affects the value of the firm.

The H1c test in Model 1 results indicate that managerial ownership does not significantly influence firm value. negative but falls short of conventional significance (B = –2.579, p = 0.100), while DPR is positive but far from significant (B = 0.060, p = 0.851). These results indicate that neither insider ownership nor dividend policy independently drives firm value in Indonesian banking.

Consequently, the assumption in model 1 claiming a notable impact is dismissed. In contrast, the outcome of Model 2 was excluded. due to perfect collinearity with the fraud interaction term. This limitation carries substantive meaning: managerial ownership in Indonesian banks is overwhelmingly close to zero. Bank regulations and ownership structure requirements limit the scope for insider shareholding, making managerial ownership a weak governance lever in this context. The managerial entrenchment hypothesis (Chen & Yu, 2012) is difficult to test empirically in a sample where insider ownership lacks meaningful variation.

The empirical data from this study support this finding. Allo Bank had low managerial ownership but recorded the highest firm value in 2021. Conversely, Bank Mayapada, despite a substantial increase in managerial ownership (up to 43.2% in 2023), experienced a low and declining firm value. This strengthens the argument that in the Indonesian banking sector, high managerial ownership does not necessarily lead to a positive impact on firm value.

This finding of Model 1 aligns with research from Fuadah et al. (2022); Karim et al. (2020); Ngatno et al. (2021); Saragih & Tampubolon, (2023); Yuwono & Aurelia, (2021). Yet, the comparatively limited impact of managerial ownership indicates that ownership alignment is not as effective in a heavily regulated and institutionally concentrated banking sector, reflecting findings from regional studies (Dang et al., 2023). When we took out the outlier data, the managerial ownership effect could potentially reduce the firm value in the banking industry. The findings from the H2 test indicate that the Dividend Payout Ratio (DPR) in Model 1 and Model 2 do not significantly influence Firm Value. The t-statistic of 0.188, paired with a significance level of 0.851 and 0.121 ($> \alpha = 0.05$), indicates that the hypothesis is dismissed. This result aligns with the Dividend Irrelevance Theory proposed by Miller and Modigliani, which asserts that dividend policy has no impact on a firm's value since investors prioritize the company's growth potential and underlying performance. Moreover, the Tax Preference Theory indicates that investors might shy away from dividends as they are subject to a higher tax rate compared to capital gains. In this scenario, substantial dividend distributions might not appeal to investors and therefore do not significantly influence firm value.

In contrast, in Model 2, there exists a negative correlation between the Dividend Payout Ratio (DPR) and Price-to-Book Value (PBV), which differs from Lintner's bird in the hand theory studies (1962). Investors favor present dividends instead of potential future capital gains due to the higher certainty of present dividends. A minimal dividend payout could be seen favorably by investors, indicating that the company is investing in growth, resulting in a high PBV. Nonetheless, a substantial payout may also be interpreted favorably as an indicator of financial stability and assurance, ultimately resulting in a high PBV (Gordon, 1963).

Our finding is supported by Fama's (1970) Efficient Market Hypothesis (EMH), particularly its semi-strong variant, which posits that information such as dividend distribution policies is rapidly and accurately reflected in stock prices. This means that the market has already reacted to this information before investors made decisions, so it is not possible to get abnormal returns just from this public information. This clarifies why the dividend policy in this research does not significantly influence company value, as dividend information is already deemed “normal” by the market.

Data gathered from this research validate this conclusion. Bank Permata, although regularly offering substantial dividends, experienced a downward trend in its corporate value. On the other hand, Bank Panin Indonesia demonstrated a rise in firm value despite not paying out dividends in some years. This indicates that dividend policy is not consistently a main factor influencing firm value in the banking industry. The results of this research align with the conclusions of Fadilah & Febrianti, (2024); Thauziad & Kholmi, (2021) and Sujono et al., (2024), who determined that the dividend payout ratio did not significantly affect business value

The results of the hypothesis 3 test indicate that Return on Assets (ROA) significantly impacts Firm Value. The t-statistic in model 1 is 2.216 with a significance level of 0.028 ($< \alpha = 0.05$), while in model 2 it is 4.007 ($p < 0.001$), both indicating substantial positive effects on firm value, thus supporting the hypothesis that claims a significant effect is accepted. ROA serves as a crucial measure of how effectively a company utilizes its total assets to produce net income. A greater ROA indicates improved efficiency. Within the banking sector, ROA is an essential indicator of profitability since assets serve as the basis for a bank's activities, especially in terms of lending and producing interest revenue (Kohlsheen et al., 2018). As a result, investors closely monitor ROA when evaluating a bank's sustainability and future potential.

This result supports Signaling Theory, which posits that a high ROA indicates a company is effectively managed and able to produce consistent profits. In a developing nation, this indication boosts investor trust, draws in additional stock acquisitions, and ultimately raises company's worth. Data from Bank Mandiri and Bank Rakyat Indonesia reveal a distinct trend: a rise in ROA is reliably succeeded by a rise in firm value (Hasan et al., 2025).

Return on Assets (ROA) emerged as the most consistent predictor of firm value, in line with prior studies emphasizing profitability's role in banking valuation (Silfia et al., 2022; Yoda et al., 2023). From a signaling point of view, profitability tells investors about how well managers are running the business and how long it can last, which makes them want to pay more for the stock (Spence, 1978). Profitability metrics provide tangible reassurance in developing nations like Indonesia, where investors face greater levels of uncertainty. However, this positive effect is contingent upon the reported earnings' credibility. Examples of fraud involving exaggerated profits (such as hypothetical loan scandals) show that when governance trust erodes, profitability's signaling function is diminished.

The results of this research are aligned with prior research from Alfianita & Perdana Wahyu Santosa, (2022); H. N. Dang et al. (2021); Fadilah & Febrianti, (2024); Thauziad & Kholmi (2021), which indicated that return on assets has a considerable impact on firm value.

The empirical findings validate that profitability, dividend policy, and Good Corporate Governance (GCG) mechanisms concurrently have a significant impact on the value of firms within Indonesian commercial banks. Nonetheless, neither the main effect of fraud nor any of the interaction terms were statistically significant, indicating that the fraud, whether considered directly or as a moderator, does not significantly alter these relationships in the sample.

The Simultaneous Effect of GCG, Dividend Policy, and Profitability on Firm Value

Based on the F-test results in H4, the variables Board Independence, audit committee, managerial ownership, dividend payout ratio, and return on assets collectively have a significant effect on firm value. This is evidenced by an F-statistic of 4.206, and a significance value of 0.001, which is less than the α = 0.05 threshold. Therefore, the hypothesis asserting a simultaneous effect is accepted.

This finding implies that the variations in firm value can be explained by the sum of these five independent factors. Effective corporate governance (Board independence, audit committee, managerial ownership), dividend policy (DPR), and profitability (ROA) all interact to affect how investors and the market view a company's value, even though none of the factors alone were significant. This is in line with the principles of Good Corporate Governance and Signaling Theory, emphasizing the importance of the interactions between various internal components in building stakeholder trust and creating long-term value for a company.

The Moderating Effect of Fraud

In H5, Fraud does not meaningfully change the impacts of Good Corporate Governance (measured by Board Independence and Audit Committees) or Dividend Payout Ratio (DPR) on firm value (PBV), as shown by non-significant interaction terms (p-values > 0.10), unlike previous findings that markets respond intensely to wrongdoing (Njoku & Lee, 2024). This suggests that fraud has no effect on the effectiveness of dividend policy or governance mechanisms in determining valuation in the sample under analysis. One theory is that fraud might have a more direct impact on company value (Richardson et al., 2022), or as a mediator of poor governance, instead of serving as a moderator. Another plausible explanation concerns measurement challenges: Financial-statement metrics and other fraud indicators usually only show extreme cases (Shahana et al., 2023). The effects of dividend signaling are recognized to differ based on institutional contexts, like investor protection (Deng et al., 2024).

Incidents of banking fraud in Indonesia usually garner a lot of media attention, which exacerbates reputational harm and undermines investor confidence. This finding supports criticisms that Indonesian banks typically have symbolic governance, with structures in place but insufficiently enforced (Patricia Sumar & Dwi Ratmono, 2024). This reflects findings from research indicating that governance structures in Indonesian banks tend to be more symbolic than meaningful, as ineffective enforcement reduces their impact (Darmawan et al., 2020; Hadisurya et al., 2025; Tumewang et al., 2025). None of the fraud interaction terms reaches statistical significance, indicating that the presence of fraud does not meaningfully alter the relationship between governance mechanisms and firm value. This null finding warrants careful interpretation rather than dismissal.

One explanation is measurement sensitivity. The binary fraud indicator captures only whether a bank experienced a fraud event in a given year; it does not capture severity, financial impact, or duration. Mild administrative sanctions and large-scale financial fraud receive the same coding, which may weaken the moderating signal. Future research could construct a continuous fraud severity level based on financial losses, regulatory penalty amounts, or the number of incidents per year.

A second explanation relates to market expectations. In a banking sector where governance failures are not uncommon, investors may have already assessed fraud risk into their valuations structurally. If the market anticipates some baseline level of fraud exposure, individual fraud events may not generate sufficient information to alter the governance–value relationship. This is consistent with the finding that fraud as a direct predictor is also insignificant (β = –1.057, $p = 0.440$).

A third possibility is governance resilience. Board independence and audit committee oversight may function as deterrent or detection mechanisms regardless of whether fraud occurs, maintaining their governance value without being disrupted by fraud events. If governance structures are sufficiently robust, the moderating effect of fraud would be mentioned into the direct effects already captured in the model.

CONCLUSION

The empirical results demonstrate that firm value in Indonesian commercial banking is shaped primarily by financial performance and specific corporate governance mechanisms. Across two complementary models—one testing direct effects on the full sample (N = 168) and another testing fraud moderation on an outlier-cleaned sample (N = 105)—the core findings are consistent. Return on assets (ROA) and board independence emerge as the only variables that positively and significantly affect firm value (PBV) in both specifications. ROA carries the largest coefficient in each model (Model 1: B = 6.481, p = 0.028; Model 2: β = 27.988, p < 0.001), confirming that profitability remains the dominant driver of market valuation and a reliable indicator of managerial efficiency in emerging-market banking (Handayani & Ibrani, 2023; Kohlscheen et al., 2018). Board independence likewise improves firm value in both models (Model 1: B = 1.842, p = 0.003; Model 2: β = 2.308, p = 0.002), supporting the view that effective independent oversight lowers agency costs, improves decision-making transparency, and raises investor confidence (Rodríguez Valencia, 2025; Souther, 2019).

The audit committee's negative and significant effect on firm value in both models (Model 1: B = –0.510, p = 0.045; Model 2: β = –0.193, p = 0.031) suggests that a larger committee may signal existing governance problems rather than stronger oversight. This counterintuitive finding is consistent with prior studies documenting a negative relationship between audit committee size and firm performance in emerging markets (Altin, 2024), and points to the importance of committee quality and competence over numerical expansion.

Managerial ownership is negative and statistically insignificant in Model 1 (B = –2.579, p = 0.100) and could not be retained in Model 2 due to perfect collinearity between the Managerial_Ownership×Fraud interaction term and the binary fraud indicator in the cleaned dataset. This statistical constraint itself reflects a substantive reality: insider ownership in Indonesian banks is overwhelmingly close to zero, limiting its relevance as a governance mechanism in this sector and making it difficult to test the managerial entrenchment hypothesis (Chen & Yu, 2012). The dividend payout ratio (DPR) is statistically insignificant in both models (Model 1: B = 0.060, p = 0.851; Model 2: β = –0.708, p = 0.121), indicating that dividend policy does not significantly determine firm value in Indonesian banking. This likely reflects the constraints imposed by capital adequacy requirements and post-pandemic capital rebuilding pressures, which reduce the signaling power of dividends in this industry (Njoku & Lee, 2024; Seth & Mahenthiran, 2022).

A central finding of this study is that fraud, whether included as a direct predictor or as a moderating variable, does not significantly alter the governance–firm value relationship. None of the interaction terms (BI×Fraud, AC×Fraud, DPR×Fraud) reaches statistical significance, and fraud as a direct effect is likewise insignificant (β = –1.057, p = 0.440). This null result does not diminish the importance of fraud risk; rather, it suggests that the governance mechanisms tested here operate independently of fraud exposure, and that the binary fraud indicator used in this study may lack the sensitivity to capture variation in fraud severity. The finding also raises the possibility that investors in Indonesian banking have already priced a baseline level of fraud risk into their valuations structurally, reducing the incremental information content of individual fraud events.

Together, these results carry clear implications for practitioners and regulators. For bank managers and boards of directors, the most effective levers for enhancing firm value are strengthening board independence—by appointing commissioners with genuine external expertise rather than meeting minimum regulatory quotas—and improving operational efficiency to raise ROA. For regulators such as OJK (Otoritas Jasa Keuangan), these findings support policies that enforce meaningful board independence requirements and evaluate audit committee effectiveness based on oversight outcomes rather than committee size alone. From a broader policy standpoint, bolstering profitability management, transparency, and governance enforcement in banking institutions can increase investor confidence and support long-term value creation in emerging-market economies.

LIMITATIONS AND RECOMMENDATIONS

Like most empirical research, this study has several limitations that should be acknowledged honestly and transparently. First, this study relies on secondary data from annual reports of Indonesian commercial banks, where the quality and completeness of governance and fraud-related disclosures may vary across institutions. Second, the use of different data treatment strategies across models—logarithmic transformation for Model 1 (N = 168) and IQR-based outlier removal for Model 2 (N = 105)—introduces a trade-off between methodological consistency and analytical appropriateness. The 37.5% sample reduction in Model 2 may limit the statistical power to detect moderate moderating effects, which could partly explain the non-significance of the fraud interaction terms.

Third, the binary fraud indicator (1 = fraud event; 0 = no fraud) does not distinguish between the severity, financial magnitude, or nature of fraud incidents, potentially attenuating the moderating signal. Fourth, managerial ownership in Indonesian banking is overwhelmingly close to zero, which created perfect collinearity with the fraud interaction term and required its exclusion from Model 2—a structural feature of the sector that limits the assessment of insider ownership within the moderation framework. Fifth, the OLS approach cannot fully address potential reverse causality between governance quality and firm value, as more profitable banks may adopt stronger governance practices rather than governance driving value.

Based on these limitations, future research should pursue several directions. Subsequent studies should develop a continuous fraud severity measure—incorporating regulatory penalty amounts, financial losses, or forensic accounting indices—to replace the binary indicator, providing greater statistical power to detect moderating effects. Extending the observation period beyond four years would increase the sample size and enable the use of dynamic panel techniques such as system-GMM, which can better address endogeneity and capture the lagged effects of governance reforms on firm value.

Additionally, future studies could incorporate governance quality variables that go beyond numerical measures, such as audit committee financial expertise, board meeting frequency, or ESG reporting adoption. These qualitative dimensions may help explain why audit committee size negatively affects firm value in the current study: if the quality of monitoring matters more than its quantity, measures capturing committee effectiveness could reveal a more nuanced governance–value relationship. Comparative studies across multiple emerging-market banking sectors (e.g., ASEAN or BRICS economies) would also strengthen external validity and inform regional harmonization of banking governance standards.

Finally, researchers should consider alternative firm value proxies such as Tobin's Q or market-adjusted returns alongside PBV to test the robustness of the governance–valuation relationship across different performance measures. This would address the concern that PBV, while widely used in banking research, captures book value dynamics that may not fully reflect investor perceptions of governance quality.

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Spence, M. (1978). JOB MARKET SIGNALING **The essay is based on the author's doctoral dissertation ("Market Signalling: The Informational Structure of Job Markets and Related Phenomena," Ph.D. thesis, Harvard University, 1972), forthcoming as a book entitled Market Signaling: Information Transfer in Hinng and Related Screening Processes in the Harvard Economic Studies Series, Harvard University Press. The aim here is to present the outline of the signaling model and some of its conclusions. Generalizations of the numerical examples used for expositional purposes here are found in ibid, and elsewhere. In Uncertainty in Economics (pp. 281–306). Elsevier. https://doi.org/10.1016/B978-0-12-214850-7.50025-5

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TRANSFORMING HRM IN THE METAVERSE: EMPLOYEE ENGAGEMENT AND PERFORMANCE IN PHYGITAL WORKSPACES

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Abstract: *This study examined how immersive metaverse workspaces relate to employee engagement and performance in phygital work settings. A cross-sectional online survey produced 175 usable responses from employees and HR professionals aged 18–35 who had experience with Roblox, Decentraland, or Meta Horizon. The proposed model was assessed using confirmatory factor analysis and structural equation modeling. Immersive metaverse workspaces were positively associated with employee engagement ($\beta = 0.59$, $p < 0.001$), while avatar realism and social presence were positively associated with perceived employee performance ($\beta = 0.47$, $p < 0.01$). Experiential HR elements—augmented reality, NFT-based recognition, and sensory design—strengthened the relationship between immersive workspaces and engagement (interaction $\beta = 0.33$, $p < 0.05$). The study contributes by defining phygital HRM as the coordinated design of physical and immersive digital work experiences and by testing a role-consistent model grounded in employee engagement, social presence, media richness, and job resources. The findings suggest that HR managers should evaluate immersive tools as work-design resources while also addressing accessibility, privacy, digital fatigue, and ethical avatar use. Because the data were cross-sectional and self-reported, the results indicate associations rather than causal effects.*

Keywords*: Metaverse, Human Resource Management, Employee Engagement, Avatar Realism, Augmented Reality, Remote Collaboration, Virtual Training*

INTRODUCTION

Digital technologies are reshaping workplace interaction, employee development, and the organization of hybrid work. The metaverse extends this transformation by providing persistent, immersive environments in which employees can communicate, learn, and collaborate through avatars and connected devices (Hadi et al., 2024; Yoo et al., 2023). In an HRM context, these environments may support virtual onboarding, training, team interaction, and performance-related activities while connecting digital experiences with selected physical cues. This coordinated physical–digital arrangement is described here as phygital HRM (Batat, 2024; Sung et al., 2023; Kim et al., 2023).

Prior metaverse research has concentrated heavily on consumers, retailing, and marketing. That literature identifies immersion, social presence, avatar realism, augmented reality, and digital ownership as important experiential mechanisms (Ahn et al., 2024; Belk, 2024), but it does not establish how these mechanisms operate as work-design resources in HRM. Organizational research, by contrast, explains engagement through the psychological conditions of meaningfulness, safety, and availability (Kahn, 1990) and through the balance of job demands and job resources (Bakker & Demerouti, 2007). Social Presence Theory and Media Richness Theory further suggest that communication cues and media capacity can reduce psychological distance and support understanding in distributed work (Short et al., 1976; Daft & Lengel, 1986). Integrating these perspectives provides an HRM-centered basis for examining immersive workspaces without treating employees as consumers.

1. The purpose of this study is to examine whether immersive metaverse workspaces are associated with employee engagement, whether avatar realism and social presence are associated with perceived employee performance, and whether experiential HR elements strengthen the immersive-workspace–engagement relationship.
2. The originality of this study is its operationalization of phygital HRM as a coordinated employee experience that combines immersive digital interaction with physical or sensory HR cues, and its empirical testing of this arrangement through a role-consistent HRM model rather than a consumer-purchase model.
3. The contributions of this study are threefold. First, it translates metaverse constructs into an employee-centered HRM framework grounded in engagement, social presence, media richness, and job resources. Second, it distinguishes the direct roles of immersive workspaces and avatar realism/social presence from the moderating role of experiential HR elements. Third, it offers practical guidance for designing immersive HR activities while recognizing accessibility, privacy, security, digital-fatigue, and avatar-ethics concerns.

The study addresses three research questions: RQ1: How are immersive metaverse workspaces associated with employee engagement? RQ2: How are avatar realism and social presence associated with perceived employee performance? RQ3: Do experiential HR elements moderate the relationship between immersive metaverse workspaces and employee engagement?

LITERATURE REVIEW

Metaverse and the Evolution of Virtual Workspaces

Metaverse is revolutionizing digital workspace since it provides an entrancing, practical atmosphere that advances cooperation, preparation, and correspondence between the representatives. Similarly to how the retail industry has adopted the virtual store model, HR practitioners are considering the possibility of using metaverse to provide employees with a different, interactive alternative to interact, attend meetings and collaborate in real-time virtual environments (Eggenschwiler et al., 2024; Yoo et al., 2023). Such virtual working environments, usually involving the use of avatars, allow staff members to engage in remote cooperation, virtual teambuilding activities, and professional growth training sessions. They are more engaging and interactive than traditional video conferencing and create a sense of presence and connection that overcomes the physical and digital gap at the workplace (Koles et al., 2024; Sung et al., 2023). The actual benefit to the HR departments will be the ability to elaborate phygital (physical and digital) experiences through the mixing of virtual platforms and real-life HR practices. Such a convergence enables employees to undergo onboarding experiences, virtual training experiences, and group activities in experiential ways that would not exist in a purely physical or digital setting (Yim et al., 2017; Rauschnabel et al., 2022). Furthermore, such tools as smartphones and wearable devices can help HR professionals make the metaverse experiences even more accessible because employees will be able to engage in the activity literally anywhere, anytime (Yim et al., 2017; Rauschnabel et al., 2022). Household names such as Nike and Gucci have not been left behind in utilizing digital showrooms in the metaverse to connect with customers, though now business is considering the idea of virtual offices where employees will have the ability to participate in active training and team-building activities (Kim et al., 2023; Bao et al., 2024). Such metaverse platforms have the potential to transform the practice of HR by making it more interactive and involvement-oriented employee experience, enhancing remote teamwork, and developing the stronger sense of the relationship between the employee and the corporate culture.

Immersive HR Experiences and Employee Engagement

Experiential HRM can be understood as the process of providing employees with the powerful, interactive, and emotionally appealing experiences along the lines similar to the techniques applied in experiential marketing. In the metaverse, HR departments will be able to take advantage of the immersive space to enhance the overall engagement of the employees by establishing an emotionally engaging experience beyond the conventional remote work (Batat, 2024; Puntoni, 2024). These include, for example, the virtual workspaces can enable the employees to discover the company culture, attend live virtual events and even express themselves personally through avatars, thus creating the sense of belonging and contentment within the company (Belk, 2013; Bélisle & Bodur, 2010). Another major innovation in the immersive HRM is the concept of avatar realism, which enables a workforce to communicate in a more natural and affective manner than that prescribed in a conventional video conferencing (Holzwarth, Janiszewski, & Neumann, 20 Avatars, sensory design (e.g., background sounds or textures), and even gamification may improve the levels of engagement among employees, as they will find it memorable and interactive. They have also been known to strengthen the emotional connection between employees and their organizations, encourage communication, and enjoy their work (Etemad-Sajadi, 2016). Also, the virtual HRM tools, including the use of avatars and social presence, may enhance collaboration by replicating a social context of a face-to-face communication, decreasing the psychological distance and increasing trust among team members (Roggeveen & Sethuraman, 2020; Barrera & Shah, 2023).

Social Presence and Avatar Realism in Virtual Workspaces

Within the HRM context, social presence and avatar realism are an essential element toward the development of emotionally attached and effective virtual environment. Organizations can use such adaptive and realistic avatars as a means of transporting employees through an immersive and realistic virtual appearance, which increases their connectedness and diminishes a sense of isolation in distributed environments (Belslie, & Bodur, 2010; Kim, et al., 2023). The element that contributes to its importance on the employee satisfaction, engagement, and performance is social presence or the sense of presence within the virtual space. The employees are more inclined to develop an emotional connection to their peers and the company when they find the avatars realistic and relatable and, hence, do not consume as many resources, communicate more effectively, and overall, are more productive members of a team (Cyr et al., 2007; Etemad-Sajadi, 2016). Moreover, the interactions mediated by avatars do not have to be limited to social interaction, but rather involve virtual co-creation, designing products, or even taking part in an actual event, making the affiliation to the organization even stronger and encouraging collaboration (Papagiannidis et al., 2013; Gleim et al., 2024). It is expected to see better engagement of employees since the design of avatars is not a hassle, and the customization of interactions through smartphones and other devices makes the metaverse a promising platform to conduct HR duties, including training, performance evaluation, and team building (Rauschnabel et al., 2022; Lu & Mintz, 2023).

Smartphones as a Gateway to Immersive HRM

Increasingly the means of accessing immersive HRM in the metaverse is through smartphones, giving employees the flexibility to work at virtual workstations and during training programs anywhere. Incorporation of augmented reality (AR) and avatars through smartphones enable the employees to receive training materials, join virtual conferences, collaborate with other team members and feel like they are in person (Rauschnabel et al., 2022; Lu & Mintz, 2023). The concept of social presence in virtual spaces, which can be enriched with the help of smartphones, would help the HR departments make remote teams more fun and engaging to work with by providing them with a similar level of socialization and interaction as that of the regular office space. Avatars in immersive virtual environment also creating a feeling of presence between the employees and the organization reduces the psychological distance toward the organization and it gives rise to the sense of trust, enhances collaboration, and eventually the overall employee satisfaction and retention (Cyr et al., 2007; Etemad-Sajadi, 2016). By doing so, metaverse serves as a central connecting point between physical and digital that enables people to communicate, train, and collaborate in separate places without any difficulties (Papagiannidis et al., 2013; Gleim et al., 2024).

Immersive HRM Using NFTs, AR, and Customization

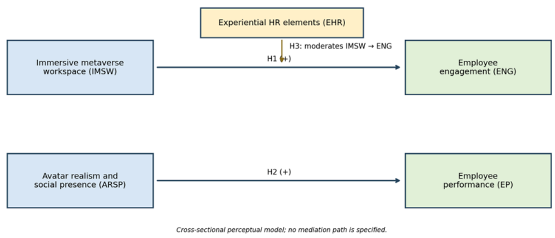
Customization and NFTs (non-fungible tokens) are becoming important aspects of immersive HRM through which organizations are personalizing and offering exclusive digital assets to employees. NFTs may be used as a certificate of accomplishment, a virtual prize, or even find in the form of an avatar that will literally show the success and level of an employee in the enterprise (Sung et al., 2023; Bao et al., 2024). This does not only create a personal touch, but also provides an employee with an opportunity to feel special and possessive of his or her virtual existence in the company. On the same note, augmented reality (AR) technologies enable employees to see training materials and organizational data in 3D, which is more interactive and memorable to learn. These immersive tools positively impact employee engagement rates as they allow the employees to be more involved in training and development processes and personalize their learning experience as well as increase their emotional engagement with an organization (Tan et al., 2022; Hilken et al., 2022). Moreover, in the event that employees are given a choice on how to customize or personalize their avatars, their virtual offices, or their training space, the human resources department of an organization can experience greater engagement, loyalty, and overall satisfaction among the workforce (Mehrotra et al., 2024; Roggeveen & Sethuraman, 2020). The move towards digital personalisation and immersive HRM is not a mere technological and technical innovation but a way of enhancing employee experience and developing greater organisational attachment.

Theoretical Foundation and Hypothesis Development

The model combines four complementary organizational perspectives. Employee engagement theory explains why work conditions that foster meaningfulness, psychological safety, and personal availability encourage employees to invest themselves in their roles (Kahn, 1990). The Job Demands–Resources model treats supportive technology and interaction quality as potential job resources, while also recognizing that poorly designed technology may become a demand (Bakker & Demerouti, 2007). Social Presence Theory predicts that richer interpersonal cues increase the perceived salience of colleagues in mediated interaction (Short et al., 1976), and Media Richness Theory proposes that media capable of transmitting timely and varied cues are better suited to equivocal work tasks (Daft & Lengel, 1986). Together, these theories support the following directional hypotheses.

1. Hypothesis 1 (H1): Immersive metaverse workspaces are positively associated with employee engagement.
   a. The immersion and interaction afforded by a metaverse workspace may operate as job resources by increasing involvement, feedback, and perceived connection. H1 therefore links IMSW directly to engagement; it does not claim effects on unmeasured satisfaction or collaboration outcomes.
2. Hypothesis 2 (H2): Avatar realism and social presence are positively associated with perceived employee performance.
   a. Realistic avatar cues and a stronger sense of social presence may reduce psychological distance and support coordination. In the tested model, the combined ARSP construct is a direct predictor, not a mediator.
3. Hypothesis 3 (H3): Experiential HR elements positively moderate the relationship between immersive metaverse workspaces and employee engagement, such that the relationship is stronger at higher levels of experiential HR elements.
   a. The model assigns one role to each construct: IMSW and ARSP are predictors, ENG and EP are outcomes, and EHR is a moderator. Smartphone/device usability was measured as an ancillary technology-quality construct but was not included as a control in the reported structural paths; accordingly, no control-variable effect is claimed.

Figure 1. Research model



METHODOLOGY

Research Desugn

A quantitative, cross-sectional survey design was used to examine associations among immersive metaverse workspaces, employee engagement, avatar realism/social presence, perceived employee performance, and experiential HR elements. The design was appropriate for testing a prespecified measurement and structural model, but it does not establish temporal order or causality. SPSS was used for data screening, descriptive statistics, and internal consistency, and AMOS was used for confirmatory factor analysis (CFA) and structural equation modeling (SEM).

Variable of the Study

1. Predictor 1: Immersive Metaverse Workspaces (IMSW).
2. Predictor 2: Avatar Realism and Social Presence (ARSP).
    a. Outcome 1: Employee Engagement (ENG).
    b. Outcome 2: Perceived Employee Performance (EP).
3. Moderator: Experiential HR Elements (EHR), including AR, NFT-based recognition, and sensory design.
4. Ancillary measured construct: Smartphone/Device Usability (not included in the reported structural paths).
5. No mediation relationship or control-variable effect was tested in the reported model.

Each focal construct was represented by three survey statements reported in Tables 4.5–4.9 and rated on a five-point Likert scale (1 = strongly disagree to 5 = strongly agree). The items were adapted to the metaverse-HRM context from the conceptual domains established in prior research on immersive experience, employee engagement, avatar realism, social presence, experiential technologies, and technology usability. Construct-level reliability and convergent validity were evaluated using Cronbach's alpha, composite reliability, and average variance extracted.

Sample Size

The final sample comprised 175 HR professionals and employees aged 18–35 who reported experience with Roblox, Decentraland, or Meta Horizon. Purposive eligibility screening was used because respondents needed prior exposure to a metaverse platform. The achieved sample exceeded common minimum rules based on the number of modeled constructs and estimated paths, but adequacy should be judged jointly with model complexity, distributional assumptions, and fit rather than by a single rule of thumb. The study did not use probability sampling; therefore, population representativeness cannot be assumed.

Data Collection

Data were collected through a structured online questionnaire circulated through LinkedIn, Reddit, and HR-focused forums. Participation was restricted to HR professionals and employees with prior experience of Roblox, Decentraland, or Meta Horizon. Screening and data-cleaning procedures produced 175 complete and usable responses for analysis. The online questionnaire contained the study information, eligibility questions, demographic measures, and five-point Likert-scale construct items. The same final sample was used for descriptive analysis, CFA, and SEM.

Data Analysis

Analysis proceeded in four stages. First, frequency distributions, item means, and sample standard deviations were computed in SPSS. Second, internal consistency and convergent validity were evaluated using Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE), followed by the Fornell–Larcker discriminant-validity assessment. Third, CFA evaluated measurement-model fit using χ^2/df, CFI, TLI, RMSEA, and SRMR. Fourth, SEM tested the two direct paths and the interaction effect specified in H3. The means and standard deviations in Tables 4.5–4.9 were recalculated from the response frequencies. Critical ratios and normal-theory 95% confidence intervals for the direct paths were calculated from the reported estimates and standard errors.

DATA ANALYSIS & RESULTS

Reliability and Validity

Internal consistency was assessed using Cronbach's alpha and composite reliability (CR), and convergent validity was assessed using average variance extracted (AVE). All alpha and CR values exceeded 0.70, while all AVE values exceeded 0.50. The results therefore support acceptable internal consistency and convergent validity across the study constructs.

Table 4.1 Reliability and Validity

Construct	Cronbach's Alpha (α)	Composite Reliability (CR)	Average Variance Extracted (AVE)
Immersive Metaverse Workspaces	0.82	0.87	0.63
Employee Engagement	0.84	0.88	0.65
Employee Performance	0.86	0.89	0.67
Avatar Realism & Social Presence	0.80	0.85	0.60
Experiential HR Elements (Physical + Virtual)	0.79	0.83	0.59
Smartphone/Device Usability	0.77	0.81	0.58

Across the six measured constructs, Cronbach's alpha ranged from 0.77 to 0.86, CR ranged from 0.81 to 0.89, and AVE ranged from 0.58 to 0.67. These values indicate acceptable construct-level reliability and convergent validity for the reported measures.

Confirmatory Factor Analysis (CFA) – Model Fit

Table 4.2 Confirmatory Factor Analysis (CFA) – Model Fit

Fit Index	Value	Recommended Threshold
Chi-square/df	1.89	< 3.00
Comparative Fit Index (CFI)	0.93	≥ 0.90
Tucker-Lewis Index (TLI)	0.91	≥ 0.90
Root Mean Square Error of Approximation (RMSEA)	0.048	≤ 0.06
Standardized Root Mean Square Residual (SRMR)	0.045	≤ 0.08

The available global fit indices indicate acceptable measurement-model fit. This conclusion concerns the covariance structure of the specified measurement model; it does not by itself demonstrate predictive accuracy or causal validity.

Discriminant Validity

Table 4.3 Discriminant Validity

Constructs	IMSW	ENG	EP	ARSP	EHR	EOU
Immersive Metaverse Workspaces (IMSW)	0.79					
Employee Engagement (ENG)	0.56	0.81				
Employee Performance (EP)	0.47	0.54	0.82			
Avatar Realism & Social	0.43	0.48	0.59	0.77		

Constructs	IMSW	ENG	EP	ARSP	EHR	EOU
Presence (ARSP)						
Experiential HR Elements (EHR)	0.52	0.46	0.50	0.51	0.76	
Ease of Use (EOU)	0.44	0.49	0.42	0.46	0.45	0.76

Note: Diagonal values in bold represent √AVE.

For each construct, the diagonal square root of AVE exceeded the corresponding inter-construct correlations. The Fornell–Larcker results therefore support discriminant validity and indicate that the constructs captured empirically distinguishable dimensions of the phygital HRM model.

Demographic Profile of Respondents

The final sample consisted of 175 respondents with prior exposure to at least one listed metaverse platform. The demographic table shows that all respondents were aged 18–35; this corrects the earlier methodological statement of 18–45.

Table 4.4 Demographic Profile of Respondents

Variable	Category	Frequency	Percentage
Gender	Male	101	58%
	Female	74	42%
Age	18–25	127	73%
	26–35	48	27%
Education	Undergraduate	114	65%
	Postgraduate	52	30%
	Others	9	5%
Metaverse Usage	Occasionally	119	68%
	Frequently	39	22%
	Rarely	17	10%
Platforms Used	Roblox	94	54%
	Decentraland	63	36%
	Meta Horizon	18	10%

Most respondents were male (58%), aged 18–25 (73%), and undergraduates (65%). Metaverse use was most often occasional (68%), and Roblox was the most frequently reported platform (54%). This profile indicates a young, digitally experienced convenience sample and limits generalization to older employees, specific industries, countries, or organizations.

Descriptive Statistics

Tables 4.5–4.9 report response frequencies for the five-point Likert items. All means and sample standard deviations were recalculated directly from the displayed counts (n = 175 per item). Percentages are rounded to whole numbers and may therefore differ marginally from values computed from the counts.

Table 4.5 Perceptions of Immersive Virtual Environments with Physical HR Elements

Statement	1 (SD)	2 (D)	3 (N)	4 (A)	5 (SA)	Mean	SD
The virtual workspace, integrated with physical elements (e.g., sensory design, real-time interactions), felt realistic and engaging.	3 (2%)	7 (4%)	21 (12%)	98 (56%)	46 (26%)	4.01	0.84
I felt fully immersed in the virtual work environment, where physical HR elements were incorporated.	2 (1%)	8 (5%)	25 (14%)	97 (55%)	43 (25%)	3.98	0.82
The design of the workspace, combining both virtual and physical elements, increased my engagement and focus on	4 (2%)	6 (3%)	28 (16%)	98 (56%)	39 (22%)	3.93	0.85

Statement	1 (SD)	2 (D)	3 (N)	4 (A)	5 (SA)	Mean	SD
tasks.							

Agreement or strong agreement with the three immersive-workspace statements ranged from 78% to 82%. Recalculated means ranged from 3.93 to 4.01, with sample standard deviations from 0.82 to 0.85. These responses indicate generally favorable perceptions, not objective evidence of productivity or causal effects.

Table 4.6 Employee Engagement in Phygital HRM Environments

Statement	1 (SD)	2 (D)	3 (N)	4 (A)	5 (SA	Mean	SD
I enjoyed participating in virtual training sessions, enhanced by physical elements, through my smartphone.	2 (1%)	5 (3%)	20 (11%)	99 (57%)	49 (28%)	4.07	0.78
I felt actively engaged in the phygital HR experience, combining virtual and physical HR elements.	3 (2%)	4 (2%)	21 (12%)	97 (55%)	50 (29%)	4.07	0.81
The experience motivated me to contribute more to team projects, blending physical and virtual interactions.	3 (2%)	6 (3%)	22 (13%)	96 (55%)	48 (27%)	4.03	0.83

Employee-engagement item means ranged from 4.03 to 4.07 after recalculation, with sample standard deviations from 0.78 to 0.83. Agreement or strong agreement ranged from 82% to 85%, indicating high self-reported engagement in this sample.

Table 4.7 Employee Performance in Phygital HRM Environments

Statement	1 (SD)	2 (D)	3 (N)	4 (A)	5 (SA	Mean	SD
I would consider participating in more HR activities if physical elements were integrated into the virtual work environment.	5 (3%)	10 (6%)	31 (18%)	89 (51%)	40 (23%)	3.85	0.94
The phygital HR experience (with both physical and virtual elements) increased my motivation to engage in team projects.	4 (2%)	9 (5%)	26 (15%)	95 (54%)	41 (24%)	3.91	0.89
I am more likely to recommend this type of HR experience to my colleagues.	6 (3%)	7 (4%)	33 (19%)	89 (51%)	40 (23%)	3.86	0.93

The three perceived-performance items had recalculated means of 3.85–3.91 and sample standard deviations of 0.89–0.94. Because these items capture intentions and self-reported motivation or advocacy rather than independently rated job output, the construct is interpreted conservatively as perceived employee performance.

Table 4.8 Avatar Realism & Social Presence in Phygital HRM

Statement	1 (SD)	2 (D)	3 (N)	4 (A)	5 (SA)	Mean	SD
The avatar felt lifelike and relatable, enhancing my virtual work experience.	4 (2%)	7 (4%)	25 (14%)	98 (56%)	41 (23%)	3.94	0.86
I felt a strong social presence through avatar interactions	3 (2%)	6 (4%)	28 (16%)	95 (54%)	43 (25%)	3.97	0.84

Statement	1 (SD)	2 (D)	3 (N)	4 (A)	5 (SA)	Mean	SD
in the virtual workspace.							
The avatar helped me feel more connected to my colleagues in the virtual workspace.	3 (2%)	5 (3%)	29 (17%)	95 (54%)	43 (25%)	3.97	0.83

The avatar realism and social presence items had recalculated means of 3.94–3.97 and sample standard deviations of 0.83–0.86. The results indicate favorable perceived connection through avatar-mediated interaction; they do not directly measure trust or emotional attachment.

Table 4.9 Experiential HR Elements (AR, NFTs, Sensory Design) in Phygital HRM

Statement	1 (SD)	2 (D)	3 (N)	4 (A)	5 (SA)	Mean	SD
Augmented Reality, integrated with physical elements, improved my understanding of HR processes.	4 (2%)	7 (4%)	24 (14%)	92 (53%)	48 (27%)	3.99	0.88
NFT-based rewards and certifications enhanced my sense of accomplishment in the virtual workspace.	6 (3%)	8 (5%)	26 (15%)	94 (54%)	41 (23%)	3.89	0.93
The virtual workspace effectively used sensory design (visuals, sounds, tactile interactions) to create an engaging HR experience.	3 (2%)	6 (4%)	22 (13%)	91 (52%)	53 (30%)	4.06	0.85

The experiential HR items had recalculated means of 3.89–4.06 and sample standard deviations of 0.85–0.93. Respondents evaluated AR-supported understanding and sensory design favorably, while the NFT-based recognition item received a slightly lower mean.

Structural Model and Hypothesis Testing

The structural model tested three prespecified relationships: IMSW → ENG (H1), ARSP → EP (H2), and the IMSW × EHR interaction predicting ENG (H3). No mediation path, satisfaction outcome, collaboration outcome, or device-usability control path was included in the reported structural model.

Structural Model Fit

The structural model demonstrated acceptable fit: $\chi^2/df = 1.95$, CFI = 0.94, TLI = 0.92, RMSEA = 0.049, and SRMR = 0.043. Each index satisfied its stated threshold, supporting the overall adequacy of the specified structural model.

Table 4.10 Structural Model Fit

Fit Index	Value	Recommended Threshold
Chi-square/df	1.95	< 3.00
Comparative Fit Index (CFI)	0.94	≥ 0.90
Tucker-Lewis Index (TLI)	0.92	≥ 0.90
RMSEA (Root Mean Square Error of Approximation)	0.049	≤ 0.06
SRMR (Standardized Root Mean Square Residual)	0.043	≤ 0.08

Acceptable global fit supports proceeding to interpretation of the prespecified paths. It does not establish causality, eliminate alternative models, or demonstrate out-of-sample prediction.

Direct Path Analysis

H1 was supported: immersive metaverse

workspaces were positively associated with employee engagement (β = 0.59, SE = 0.08, CR = 7.38, p < 0.001, normal-theory 95% CI [0.43, 0.75]). H2 was also supported: avatar realism and social presence were positively associated with perceived employee performance (β = 0.47, SE = 0.10, CR = 4.70, p < 0.01, normal-theory 95% CI [0.27, 0.67]).

Table 4.11 Direct Path Analysis

Hypothesis	**Relationship**	**Estimate (β)**	**Standard Error**	**CR and 95% CI**	**p-value result**
H1	Immersive Workspaces → Employee Engagement	0.59	0.08	7.38; [0.43, 0.75]	< 0.001 Supported
H2	Avatar Realism & Social Presence → Perceived Employee Performance	0.47	0.10	4.70; [0.27, 0.67]	< 0.01; Supported

The direct-path estimates show positive associations in the specified sample. Because the study is cross-sectional and self-reported, the estimates should not be described as causal effects.

Moderation Analysis

Moderation analysis tested whether experiential HR elements changed the strength of the relationship between immersive metaverse workspaces and employee engagement.

The interaction coefficient was positive and statistically significant (β = 0.33, p < 0.05), supporting H3. This is a moderation result, not mediation.

Table 4.12 Moderation Analysis

Moderation Effect	**Estimate (β)**	**p-value**	**Result**
Immersive Workspaces × Experiential HR Elements → Engagement	0.33	< 0.05	Supported

The positive interaction indicates that the relationship between immersive metaverse workspaces and employee engagement became stronger as experiential HR elements increased. This result supports the proposed boundary condition: immersive workspaces were associated with particularly strong engagement when reinforced through AR, NFT-based recognition, and sensory design.

Summary of Hypotheses Testing

All three specified hypotheses were supported: IMSW was positively associated with engagement, ARSP was positively associated with perceived performance, and EHR positively moderated the IMSW–engagement relationship. No conclusions are drawn for satisfaction, loyalty, trust, collaboration, organizational performance, or mediation because these outcomes or mechanisms were not tested in the reported model.

Hypothesis	**Statement**	**Estimate (β)**	**p-value**	**Status**
H1	Immersive workspaces positively influence employee engagement.	0.59	< 0.001	Supported
H2	Avatar realism and social presence positively influence employee performance.	0.47	< 0.01	Supported
H3	Experiential HR elements moderate the immersive experience effect.	0.33	< 0.05	Supported

Overall, the results support the proposed association-based phygital HRM model within this sample. The evidence is strongest for self-reported engagement and perceived performance and should be interpreted in light of the cross-sectional design, purposive recruitment, and incomplete item-level SEM diagnostics.

DISCUSSION

The findings extend metaverse research into an HRM and organizational-behavior context. The positive IMSW–engagement relationship is consistent with Kahn's (1990) view that employees invest themselves more fully when work conditions support meaningful involvement and psychological availability. It is also compatible with the Job Demands–Resources model: immersion, timely feedback, and interactive cues may function as resources that facilitate involvement (Bakker & Demerouti, 2007). However, the design cannot determine whether immersion caused engagement; engaged employees may also evaluate immersive tools more favorably. The positive ARSP–performance association is consistent with Social Presence Theory and Media Richness Theory, because salient interpersonal cues and richer communication can reduce ambiguity in distributed work (Short et al., 1976; Daft & Lengel, 1986). This HRM interpretation is more appropriate than treating employees as consumers or inferring loyalty and brand effects that were not measured.

The positive moderation result suggests that AR, sensory design, and digital recognition may strengthen the association between an immersive workspace and engagement. For HR practice, the implication is selective rather than universal adoption: organizations should match immersive features to the task, provide accessible alternatives, train users, and evaluate employee outcomes before scaling. Managers should also establish safeguards for biometric and behavioral data, avatar identity, harassment, NFT ownership, security, and informed participation. Immersive technology can also create job demands through cognitive overload, surveillance concerns, equipment inequality, and digital fatigue. These boundary conditions qualify any claim that metaverse workspaces necessarily improve employee experience.

CONCLUSION

This study found that immersive metaverse workspaces were positively associated with employee engagement, avatar realism and social presence were positively associated with perceived employee performance, and experiential HR elements strengthened the immersive-workspace–engagement relationship. The study's contribution lies in defining phygital HRM as coordinated physical and immersive digital work design and in testing a model that assigns consistent roles to its predictors, moderator, and outcomes. The evidence supports cautious experimentation with immersive HR activities, not claims of disruption, competitive advantage, loyalty, or organizational-performance improvement. Decisions to adopt metaverse tools should therefore be based on task fit, employee accessibility, privacy and security controls, ethical avatar governance, and continuing outcome evaluation.

Limitations

The study has several limitations.

1. its cross-sectional design captures associations at one point in time and does not establish causality. Second, t
2. The use of self-reported measures may introduce social-desirability and common-method bias.
3. Purposive online recruitment and the predominance of respondents aged 18–25 restrict generalization to older employees and the wider workforce.

4. Perceived employee performance was measured through respondent evaluations rather than supervisor ratings or archival performance indicators.

These limitations define appropriate boundaries for interpreting the findings.

Directions for Further Research

1. Future research should use longitudinal, experimental, or time-lagged designs to establish temporal order and compare metaverse-based HR activities with video-conferencing and face-to-face alternatives.
2. Multi-source studies should combine employee responses with supervisor-rated or objective performance indicators. Researchers should validate the measurement model across countries, industries, age groups, and levels of digital literacy; test measurement invariance; and distinguish avatar realism from social presence.
3. Further work should examine psychological safety, trust, technostress, privacy concern, accessibility, and digital fatigue as mechanisms or boundary conditions.
4. Qualitative studies can additionally explore employee consent, identity, inclusion, surveillance, and the ethics of avatar- and NFT-enabled HR practices.

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THE EFFECT OF FINANCIAL LITERACY ON MSME PERFORMANCE THROUGH ACCESS TO FINANCING PRODUCTS AND FINANCIAL RISK ATTITUDE: A STUDY ON PADANG RESTAURANT MSMES IN BANDUNG CITY

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Abstract: *Micro, Small, and Medium Enterprises (MSMEs) in the culinary sector play an important role in the economy of Bandung City. However, they continue to face challenges related to financial management, access to financing products, and financial risk-related decision-making. This study aims to analyze the effect of Financial Literacy on MSME Performance through Access to Financing Products and Financial Risk Attitude as mediating variables. This study employed a quantitative approach with an explanatory research method. Primary data were collected by distributing questionnaires to 155 owners or managers of Padang restaurants in Bandung City selected using a purposive sampling technique. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0 software. The results indicate that Financial Literacy has a positive and significant effect on MSME Performance, Access to Financing Products, and Financial Risk Attitude. Access to Financing Products and Financial Risk Attitude also have positive and significant effects on MSME Performance. Furthermore, Access to Financing Products and Financial Risk Attitude significantly mediate the effect of Financial Literacy on MSME Performance, indicating partial mediation. These findings demonstrate that Financial Literacy can improve MSME Performance both directly and indirectly through enhanced access to financing products and a more measured attitude toward financial risk. The findings are expected to provide practical considerations for MSME owners, financial institutions, and the government in supporting the performance improvement of Padang restaurant MSMEs in Bandung City.*

Keywords: *Financial Literacy; Access to Financing Products; Financial Risk Attitude; MSME Performance; Padang Restaurant.*

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a fundamental role in sustaining Indonesia's national economy. Based on Bank Indonesia data (2024), MSMEs contribute more than 61% of the Gross Domestic Product (GDP) and absorb more than 97% of the national workforce, positioning them as the backbone of the Indonesian economy. However, a large proportion of MSME actors still face structural constraints, particularly in financial management, access to formal financing, and understanding of business risk (Bank Indonesia, 2024). These challenges are closely related to the still-low level of financial literacy among MSME actors. According to Graña-Alvarez et al. (2024), financial literacy is a managerial competency that functions as cognitive capital for improving financial decision-making and business performance. Prior studies show that financial literacy does not only affect business performance directly, but also indirectly through the ability of business actors to access financing and manage financial risk (Molina-García et al., 2023).

The literature identifies several core dimensions of financial literacy, namely financial knowledge, skills, attitudes, and behavior, which interact with one another in shaping the effectiveness of financial decision-making (Kristanto HC, 2022). Business actors with high financial literacy are better able to manage cash flow, plan investments, minimize unproductive debt, and develop sustainable financial strategies. Conversely, low financial literacy can lead to miscalculated capital needs, inefficient cash-flow management, and dependence on informal financing sources.

In Indonesia, financial literacy remains an important issue given the still-limited access of MSME actors to formal financial institutions. Bank Indonesia (2024) reports that around 49% of MSMEs do not yet have access to formal banking services due to limited financial documentation, lack of collateral, and limited understanding of credit procedures. Access to formal financing is one of the key factors in developing business capacity and sustainability (Kartini & Wijaya, 2024). Financial literacy and access to financing are therefore two complementary aspects that jointly influence the performance of small and medium enterprises. In addition, financial risk attitude plays an important role in shaping the financial behavior of MSME actors. Financial risk attitude reflects the degree of courage business actors show in making decisions under uncertainty; actors with a positive risk attitude tend to be more adaptive to market changes, more willing to innovate, and more likely to increase profitability (Fitria et al., 2021). A combination of sound financial literacy, adequate access to financing, and a rational risk attitude can therefore serve as an important foundation for improving MSME performance.

Nevertheless, prior studies show inconsistent findings regarding the relationship between financial literacy and MSME performance. Wati et al. (2025) found that improved financial literacy enhances capital efficiency and drives business profit growth. Sukaesih et al. (2025) similarly showed that financial-literacy training directly improves MSME actors' ability to manage capital, expand access to formal financing, and improve financial performance, a finding consistent with Sugangga et al. (2023), who emphasized financial literacy as a key component of competitive advantage and sustainability among Indonesian MSMEs. In contrast, Sariwulan et al. (2023) concluded that financial literacy does not have a significant effect on MSME performance, while Fitria (2024) found that although business actors possessed a moderate level of financial literacy, this had not translated into a measurable improvement in business performance.

This inconsistency may occur because not all MSME actors who possess financial knowledge are able to implement it in actual business practice, so that literacy does not automatically translate into performance. Business performance is also shaped by other factors, such as experience, external support, and the way business actors respond to and make financial decisions; in some cases, businesses continue to operate despite a low level of financial literacy. This inconsistency therefore suggests that the relationship between financial literacy and business performance may not be direct, but instead mediated by other factors such as access to financing products and financial risk attitude.

culinary sector accounts for the largest number of MSME units in Bandung, with 5,597 business units recorded over the 2016–2025 period, followed by fashion with 1,948 units and other smaller sectors. Bandung is widely recognized as one of

Indonesia's culinary-tourism centers, with a growing variety of cafés, restaurants, coffee shops, and local specialty foods driven by rising urban mobility and domestic tourism. However, data from Susanti (2023) indicates that around 50% of micro businesses in Bandung do not yet hold an official business license (NIB), signaling a still-low level of formalization and managerial capability among many culinary business actors. Many culinary MSMEs also do not yet maintain adequate financial records, tend to mix personal and business finances, and have not optimally managed business risk (Indah & Alfianto, 2025) even though sound financial management is a key indicator of financial literacy that directly affects business performance.

This condition is reinforced by Sari et al. (2025), who found that financial literacy and capital efficiency have a positive effect on the financial performance of MSMEs in Makassar. Sukaesih et al. (2025) likewise found that financial-literacy training improves culinary business actors' ability to manage capital and expand access to formal financing. Purnamawati & Rachmawati (2025) showed that culinary business actors who understand financial literacy are able to reduce their dependence on informal loans, while Sugangga et al. (2023) argued that financial literacy is a key foundation for building the competitive advantage of Indonesian MSMEs. Financial literacy therefore contributes not only to improved capital efficiency, but also to strengthening the competitiveness of small businesses.

A concrete example of financial-literacy strengthening is the mentoring program conducted by the Faculty of Administrative Science, Universitas Indonesia (FIA UI), in Banyumas. A post-program survey found that most MSME actors experienced a monthly profit increase of between 10% and 70% after adopting more disciplined financial record-keeping, with some participants recording additional monthly profits of between IDR 500,000 and IDR 10,000,000; more than half of the participants also reported increased discipline and confidence in managing their finances (FIA UI, 2024, as cited in Saptono, 2025). This confirms that financial literacy is not merely a theoretical concept, but has a real economic effect on business profitability and resilience.

This study specifically focuses on Padang restaurant MSMEs rather than culinary MSMEs in general, because Bandung's culinary sector is highly heterogeneous, encompassing cafés, restaurants, coffee shops, general eateries, and light-food businesses. This diversity may give rise to variation in business models, business scale, cost structures, and financial-management patterns that could confound the analysis of the relationship being studied. By focusing on a relatively homogeneous type of culinary business, the effect of financial literacy on MSME performance through access to financing products and financial risk attitude can be examined more precisely. Padang restaurants were selected for this study because of their wide distribution across Bandung, which provides an adequate population for the research, as well as their operational characteristics, which are strongly dependent on the management of working capital, cash flow, and continuous raw-material procurement characteristics that make this business type particularly relevant for examining the relationship between financial literacy and MSME performance.

Management. Studies specifically examining the relationship between financial literacy, access to financing products, and financial risk attitude in relation to the performance of culinary MSMEs in Bandung remain relatively limited. Furthermore, prior findings on the effect of financial literacy on MSME performance remain inconsistent, with some studies finding a significant positive effect and others finding no significant effect. This inconsistency indicates the need for further study that incorporates mediating variables such as access to financing products and financial risk attitude in order to understand the relationships among these variables more comprehensively. This study therefore aims to analyze the effect of financial literacy on the performance of culinary MSMEs in Bandung City through access to financing products and financial risk attitude as mediating variables, focusing specifically on Padang restaurant MSMEs.

From a theoretical perspective, this study is grounded in the Resource-Based View (RBV), which holds that an organization's competitive advantage and performance are strongly shaped by its ability to manage and utilize its internal resources optimally. These resources include tangible and intangible assets such as physical capital, managerial expertise, and the knowledge and capabilities of individuals within the organization (Wernerfelt, 1984). RBV assumes that a firm's success in achieving sustainable competitive advantage depends on the extent to which it possesses and manages resources that are valuable, rare, inimitable, and non-substitutable to the VRIN framework (Barney, 1991). Within the context of MSMEs, financial literacy represents an intangible resource of strategic value for business continuity, enabling business actors to understand financial statements, manage cash flow, make investment decisions, and minimize financial risk (Eniola & Entebang, 2017). Because not all business actors possess this capability equally, financial literacy can also become a source of competitive advantage, meaning that MSME actors with high financial literacy have a greater chance of surviving and growing than those without adequate financial understanding.

The practical novelty of this study lies in identifying the behavioral mechanisms namely access to financing products and financial risk attitude that bridge the gap between financial literacy and the long-term performance of Padang restaurant MSMEs in Bandung City. The theoretical novelty lies in the development of an integrated framework that applies the Resource-Based View through a dual-mediation mechanism involving access to financing products and financial risk attitude to explain the formation of MSME performance, an approach that has not been widely applied specifically within the culinary sector. Meanwhile, the methodological novelty lies in the examination of an RBV-based structural model through a dual-mediation framework using SEM-PLS, applied specifically to Padang restaurant MSMEs in Bandung City. This approach is expected to provide more contextualized empirical insight into the determinants of MSME performance within the culinary industry.

RESOURCE-BASED VIEW, FINANCIAL LITERACY, AND THE PERFORMANCE OF CULINARY MSMES

Within the Resource-Based View, the relationship between financial literacy, access to financing products, financial risk attitude, and MSME performance can be viewed as an interrelated set of internal resource capabilities. Financial literacy functions as a form of intellectual asset that helps MSME actors capture external opportunities, such as access to financing, while also managing the uncertainty that arises from financial risk. When business actors are able to manage both aspects effectively, this directly contributes to improved business performance (Eniola & Entebang, 2017).

Financial literacy is defined as an individual's ability to understand and manage financial resources effectively in order to achieve financial well-being. It encompasses not only knowledge of financial products, but also the ability to make sound decisions regarding money management, savings, investment, and risk control. According to Chen and Volpe (1998), financial literacy comprises four main dimensions: general personal-finance knowledge, understanding of credit management, understanding of savings and investment, and knowledge of risk management. In Indonesia, financial literacy is understood as the public's capacity to understand and appropriately use financial products and services according to their needs and financial capability, encompassing the understanding, confidence, and skills required to manage financial resources for sustainable well-being (POJK No. 76/POJK.07/2016).

MSMEs are defined, under Law No. 20 of 2008 concerning Micro, Small, and Medium Enterprises, as independent productive economic activities that are not subsidiaries or branches of larger companies, and are classified into three categories based on net assets and annual sales: micro enterprises (net assets up to IDR 50 million or annual sales up to IDR 300 million), small enterprises (net assets from IDR 50 million up to IDR 500 million or annual sales from IDR 300 million up to IDR 2.5 billion), and medium enterprises (net assets from IDR 500 million up to IDR 10 billion or annual sales from IDR 2.5 billion up to IDR 50 billion).

MSME performance describes the extent to which business actors achieve business objectives through efficiency, growth, and sustainability, encompassing both financial performance (such as profitability and revenue growth) and non-financial performance (such as customer satisfaction, innovation, and operational efficiency) (Hudson et al., 2001). Access to financing products refers to the ability of individuals or business actors to obtain formal financial services such as loans, savings, and investment financing, and is considered a key determinant of small-business growth because it enables business actors to allocate resources efficiently and develop business innovation (Adomako et al., 2016). Financial risk attitude, meanwhile, refers to an individual's tendency in assessing and making decisions related to financial risk, ranging from risk-averse to risk-neutral to risk-seeking behavior (Ye & Kulathunga, 2019); a moderate, well-calibrated risk attitude helps business actors make strategic and innovative decisions without compromising financial stability.

The Effect of Financial Literacy on MSME Performance

Financial literacy enables MSME actors to manage working capital, control cash flow, and design efficient investment strategies. Haikal et al. (2025) found that MSME actors with a high level of financial literacy tend to achieve better business performance because they are able to manage funds in a more directed manner. This finding is consistent with Masdupi et al. (2024), who showed that financial literacy has a positive effect on business sustainability through improved financial-planning ability and risk control. Accordingly, the higher an MSME actor's financial literacy, the better the resulting business performance is expected to be.

H1: Financial literacy has a positive effect on MSME performance.

The Effect of Financial Literacy on Access to Financing Products

Access to financing products provides business actors with the opportunity to obtain working capital, pursue expansion, and strengthen competitiveness, while also helping MSME actors overcome capital constraints, which are often a major obstacle to business development. Anthanasius Fomum & Opperman (2023) found that ease of obtaining financing has a positive effect on MSME performance, particularly among businesses that actively use digital financial services. Susanti and Putra (2025) further noted that the broader an MSME actor's access to formal financing products, the higher the resulting business productivity and growth capacity.

H3: Access to financing products has a positive effect on MSME performance.

The Effect of Access to Financing Products on MSME Performance

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H3: Access to financing products has a positive effect on MSME performance.

The Effect of Financial Literacy on Financial Risk Attitude

Financial risk attitude reflects how individuals view and respond to uncertainty in financial decisions. According to Ye and Kulathunga (2019), individuals with a good level of financial literacy tend to hold a more rational risk attitude, as they are better able to weigh potential gains and losses objectively. Masdupi et al. (2024) explained that financial literacy affects risk attitude through a better understanding of risk concepts, debt management, and investment diversification, while Sukmana (2024) found that business actors with adequate financial knowledge are better able to manage fear of risk and make balanced business decisions.

H4: Financial literacy has a positive effect on financial risk attitude.

The Effect of Financial Risk Attitude on MSME Performance

Financial risk attitude plays an important role in shaping business decision-making behavior. A balanced risk attitude helps business actors assess uncertainty without avoiding profitable opportunities, and business actors who are willing to take calculated risks tend to be more innovative and responsive to market opportunities. Masdupi et al. (2024) found that a positive risk attitude can improve business performance through faster and more efficient decision-making, while Sukmana (2024) showed that an adaptive risk attitude encourages MSME actors to innovate and expand their market reach, ultimately improving overall business performance.

H5: Financial risk attitude has a positive effect on MSME performance.

Based on the theoretical review and hypothesis development above, the research model employed in this study is presented in Figure 1.

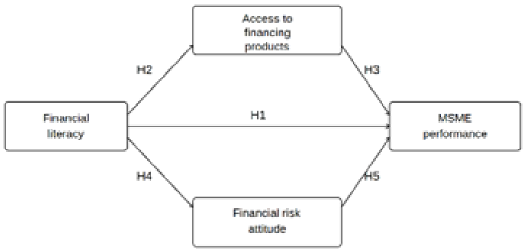

Figure 1 Research Model (Adapted from Susanti & Rediyanto Putra, 2025)

METHODOLOGY

This study employs a quantitative approach using an explanatory method. This approach was chosen because the study aims to test the relationships and effects among variables formulated in the hypotheses namely the effect of financial literacy on MSME performance, with access to financing products and financial risk attitude as mediating variables. According to Chaniago et al. (2023), quantitative research is a research method aimed at systematically describing and analyzing phenomena using numerical, statistics-based data. An explanatory approach was used because this study does not merely describe a phenomenon, but also explains the causal relationships among variables through hypothesis testing.

The object of this research covers the variables of financial literacy as the independent variable; access to financing products and financial risk attitude as the mediating variables; and MSME performance as the dependent variable. The subjects of this research are the owners and managers of Padang restaurant MSMEs operating in Bandung City, who are directly responsible for financial decision-making within their businesses (Chaniago et al., 2023).

The population in this study consists of Padang restaurant MSME actors operating in Bandung City. Because no official register of Padang restaurants is maintained by the Bandung City Office of Cooperatives and MSMEs (2025), which records 5,597 culinary MSME units in the city as a whole, the exact population size is unknown. The sample was therefore determined using a non-probability sampling technique with a purposive-sampling approach, selected because the researcher set specific criteria in line with the objectives of the study (Chaniago et al., 2023). The sample criteria used in this study are as follows:

1. Owning or managing a Padang restaurant MSME.
2. Operating the business for at least one (1) year.
3. Employing at least one (1) employee.

Sample Size Determination

The sample size in this study was determined using the rule-of-thumb approach in SEM-PLS, based on the number of research indicators, as proposed by Hair et al. (2022). Under this approach, the recommended sample size in SEM-PLS is 5 to 10 times the total number of indicators used in the study, expressed as $n = k \times$ number of indicators, where n is the sample size and k is a constant ranging from 5 to 10. This study uses 31 indicators; applying a constant of 5 yields a minimum required sample size of $31 \times 5 = 155$ respondents. Accordingly, the sample used in this study consists of 155 respondents.

Types and Techniques of Data Collection

This study uses both primary and secondary data. Primary data were obtained directly through the distribution of a questionnaire to respondents namely owners and managers of Padang restaurant MSMEs in Bandung City containing statements developed from the indicators of each research variable. Secondary data, obtained from reports of the Bandung City Office of Cooperatives and MSMEs, academic journals, and official institutional publications, were used to describe the research context and were not included in the statistical analysis. Data collection was carried out through a survey method, in which the questionnaire was distributed to respondents either directly or through online media. Each response was scored according to whether it reflected a positive or negative statement, using a five-point Likert scale ranging from a minimum score of 1 to a maximum score of 5, as shown in Table 1.

Table 1 Likert Scale Scores

No	Response	Score
1	Strongly Disagree (SD)	1
2	Disagree (D)	2
3	Neutral (N)	3
4	Agree (A)	4
5	Strongly Agree (SA)	5

According to Chaniago et al. (2023), the Likert scale is a measurement instrument that asks respondents to rate statements on a continuum from agreement to disagreement; scores are assigned to each response option and summed to produce a quantitative measure of attitude or perception.

Operational Variables

The operational variables used in this study are presented in Table 2.

Table 2 Operational Variables

Variable	Indicator	Indicator
Financial Literacy	LK01	I am able to prepare my business's monthly income statement.
	LK02	I have attended training on financial bookkeeping.
	LK03	I have sufficient knowledge to prepare basic financial records.
	LK04	I know the documents required to apply for a bank loan.
	LK05	I am able to calculate loan costs.
	LK06	I understand the costs and benefits of using credit.
	LK07	I am able to calculate loan interest and installment payments correctly
	LK08	My business has a business savings account.
	LK09	I have the ability to minimize losses resulting from non-performing loans.
	LK10	I regularly conduct financial analysis of my business.
	LK11	I am able to evaluate the future prospects of r business.
Access to Financing Products	APP1	The loan products offered meet my business needs.
	APP2	The bank's loan terms and conditions are beneficial for my business.
	APP3	The savings products offered by banks are secure for my business.
	APP4	Banking financial services help improve my business
	APP5	The bank account opening fee is affordable for my business.
	APP6	My business has formal insurance coverage.
	APP7	I prefer borrowing from a cooperative rather than from a bank.
inancial Risk Attitude	SRK1	I set aside part of my income for business development.
	SRK2	I allocate part of my income to invest in stocks or mutual funds.
	SRK3	I set aside part of my income each month as an emergency fund for my business.
	SRK4	High-risk financial activities involve a greater possibility of financial loss.
MSME 'erformance	KU1	My business has reached its break-even point (BEP).
	KU2	My business has experienced an increase in profit.
	KU3	My business has experienced an increase in profit
	KU4	My business's operating costs have decreased.
	KU5	My business responds quickly to customer requests.
	KU6	Customer satisfaction with my business has improved.
	KU7	Customer orders are confirmed promptly.
	KU8	Employees feel comfortable working in my business.
	KU9	Employees share the same vision and mission in developing the business.

DATA ANALYSIS METHODS

Data in this study were analyzed using Structural Equation Modeling based on Partial Least Squares (SEM-PLS) with the assistance of SmartPLS 4.0 software. This method was chosen for its ability to analyze complex relationships among latent variables and to test both direct and indirect effects, including mediation effects, simultaneously. According to Ghozali and Kusumadewi (2023), SEM-PLS is a multivariate analysis technique used to test theoretical models and the pattern of relationships between observed and latent variables simultaneously.

Structural Equation Modeling – Partial Least Squares (SEM-PLS)

Structural Equation Modeling (SEM) is a statistical method used to test causal relationships among latent variables within a research model. In this study, SEM is used to test the conceptual model of the effect of financial literacy on MSME performance, with access to financing products and financial risk attitude as mediating variables, an approach well suited to research examining both direct and indirect relationships among variables. Partial Least Squares (PLS) is a variance-based approach to SEM developed for prediction purposes and for testing complex models. According to Ghozali and Kusumadewi (2023), PLS is used to estimate the relationships among latent variables (inner model) as well as the relationships between latent variables and their indicators (outer model).

Measurement Model Evaluation (Outer Model)

The outer model describes the relationship between a latent construct and the indicators that measure it. Outer-model evaluation aims to assess the validity and reliability of each research indicator. According to Ghozali and Kusumadewi (2023), outer-model evaluation consists of three main tests:

1. **Convergent Validity** used to measure the extent to which the indicators of a construct are strongly correlated with one another. An indicator is considered valid if its loading factor exceeds 0.70 and the construct's Average Variance Extracted (AVE) exceeds 0.50.
2. **Discriminant Validity** used to assess the extent to which different constructs are empirically distinct from one another. Discriminant validity is achieved when the square root of a construct's AVE exceeds its correlations with other constructs.
3. **Composite Reliability and Cronbach's Alpha** used to measure the internal consistency of a construct. Composite Reliability and Cronbach's Alpha values exceeding 0.70 indicate good reliability. A construct is deemed valid and reliable once all of the above criteria are satisfied.

Structural Model Evaluation (Inner Model)

The inner model explains the relationships among latent variables based on the theory underlying the research. Inner-model evaluation is conducted to determine the strength and significance of the relationships among latent variables. According to Ghozali and Latan (2023), inner-model evaluation involves several stages:

1. **Coefficient of Determination (R^2)** indicates the extent to which the independent variables explain the dependent variable.
2. **Model Fit** was assessed using SRMR and NFI. The SRMR (Standardized Root Mean Square Residual) value below 0.10 indicates an acceptable model fit (Ghozali & Kusumadewi, 2023), while the NFI (Normed Fit Index) ranges from 0 to 1, with values closer to 1 indicating a better fit relative to the baseline model; a value approaching 0.90 is generally considered an acceptable level of fit (Ghozali & Kusumadewi, 2023).

Hypothesis Testing (Bootstrapping)

Significance testing is used to determine whether the relationships among variables in the research model are statistically significant. In PLS, significance testing is conducted using the bootstrapping procedure, a resampling method used to generate the empirical distribution of the model's path coefficients. In this study, bootstrapping was run with 5,000 resamples. According to Ghozali and Kusumadewi (2023), bootstrapping produces a t-statistic and a p-value for each path. A relationship between variables is considered significant when it meets the following criteria: a t-statistic greater than 1.96 (at a 0.05 significance level), and a p-value below 0.05. This testing procedure is applied to both direct and indirect effects; when a mediating variable shows a significant result for the indirect effect, that variable can be concluded to play a mediating role in the relationship between the corresponding variables.

RESULTS AND DISCUSSION

Data were analyzed using Structural Equation Modeling based on Partial Least Squares (SEM-PLS) with the assistance of SmartPLS 4.0 software (Ringle et al., 2024), based on 155 valid questionnaire responses collected from owners and managers of Padang restaurant MSMEs in Bandung City. The analysis covers the evaluation of the measurement model (outer model), the structural model (inner model), hypothesis.

Measurement Model (Outer Model)

The measurement model was evaluated through convergent validity (outer loadings and Average Variance Extracted/AVE) and construct reliability (Cronbach's Alpha and Composite Reliability). An indicator is considered to have adequate convergent validity when its outer loading exceeds 0.70 and the corresponding construct achieves an AVE greater than 0.50, while a construct is considered reliable when its Cronbach's Alpha and Composite Reliability values exceed 0.70. The results are presented in Table 3.

Table 3 Measurement Model Analysis

Variable	Indicator	Loading	Cronbach's Alpha	rho_a	rho_c	AVE
Financial Literacy (LK)	LK1	0.760	0.928	0.929	0.939	0.583
	LK2	0.761				
	LK3	0.769				
	LK4	0.767				
	LK5	0.769				
	LK6	0.761				
	LK7	0.757				
	LK8	0.766				
	LK9	0.759				
	LK10	0.770				
	LK11	0.758				
Access to Financing Products (APP)	APP1	0.865	0.932	0.934	0.945	0.711
	APP2	0.859				
	APP3	0.824				
	APP4	0.780				
	APP5	0.863				
	APP6	0.891				
	APP7	0.817				
Financial Risk Attitude (SRK)	SRK1	0.911	0.900	0.902	0.931	0.771
	SRK2	0.871				
	SRK3	0.833				
	SRK4	0.894				
MSME Performance (KU)	KU1	0.771	0.943	0.945	0.952	0.689
	KU2	0.870				
	KU3	0.899				
	KU4	0.842				
	KU5	0.845				
	KU6	0.847				
	KU7	0.792				
	KU8	0.762				
	KU9	0.835				

Table 3 shows that all 31 indicators produced outer loading values above 0.70, so no indicators needed to be removed from the model. All four constructs achieved AVE values above 0.50, satisfying the convergent-validity requirement, while Cronbach's Alpha, rho_a, and rho_c values for all constructs exceeded 0.70, indicating satisfactory construct reliability. Therefore, all constructs were considered valid and reliable and suitable for subsequent structural model analysis.

In addition to convergent validity and construct reliability, discriminant validity was assessed using the Fornell–Larcker criterion and the Heterotrait–Monotrait Ratio (HTMT). The results are presented in Table 4 and Table 5.

Table 4 Discriminant Validity Analysis (Fornell–Larcker Criterion)

	APP	KU	LK	SRK
APP	0.843			
KU	0.553	0.830		
LK	0.531	0.731	0.763	
SRK	0.359	0.616	0.662	0.878

Based on Table 4, the square root of the AVE for each construct (shown on the diagonal) is greater than its correlations with the other constructs, confirming that discriminant validity is established.

Table 5 Discriminant Validity Analysis (HTMT)

	APP	KU	LK	SRK
APP				
KU	0.588			
LK	0.568	0.780		
SRK	0.392	0.667	0.721	

Based on Table 5, all HTMT values are below the recommended threshold of 0.90 (Hair et al., 2022), with the highest value observed between Financial Literacy and MSME Performance (0.780) and the lowest between Financial Risk Attitude and Access to Financing Products (0.392). These results confirm that all constructs are empirically distinct from one another.

Structural Model Evaluation (Inner Model)

After the measurement model satisfied the validity and reliability requirements, the structural model was evaluated through model-fit assessment, the coefficient of determination (R^2), path coefficients, and hypothesis testing via bootstrapping.

Table 6 Model Fit Analysis

Indicator	Value	Criterion	Result
SRMR	0.048	< 0.10	Fit
NFI	0.867	Close to 0.90	Acceptable

The SRMR value of 0.048 is below the recommended threshold of 0.10, indicating that the proposed model has a good level of fit, while the NFI value of 0.867 indicates an acceptable level of model fit. The proposed research model is therefore considered adequate for examining the relationships among the constructs in this study.

Table 7 Coefficient of Determination (R^2)

Dependent Variable	R-square	R-square adjusted
Access to Financing Products (APP)	0.281	0.277
Financial Risk Attitude (SRK)	0.438	0.434
MSME Performance (KU)	0.603	0.595

The R^2 values indicate that financial literacy explains 28.1% of the variance in access to financing products and 43.8% of the variance in financial risk attitude, while financial literacy, access to financing products, and financial risk attitude jointly explain 60.3% of the variance in MSME performance. Following the benchmarks of Hair et al. (2022), in which R^2 values of 0.75, 0.50, and 0.25 are described as substantial, moderate, and weak respectively, the R^2 value for MSME performance (0.603) falls within the moderate range, while the R^2 values for financial risk attitude (0.438) and access to financing products (0.281) fall between the weak and moderate ranges.

Hypothesis Testing

Hypothesis testing was conducted using the bootstrapping procedure (5,000 resamples) to determine whether the path relationships proposed in the research model are statistically significant. A hypothesis is considered supported when the t-statistic exceeds 1.96 and the p-value is below 0.05

(Hair et al., 2022). The results are presented in Table 8.

Table 8 Hypothesis Testing Results (Path Coefficients)

Hypothesis	Original Sample (O)	T Statistics	P Values	Result
H1 Financial Literacy → MSME Performance	0.456	5.631	0.000	Supported
H2 Financial Literacy → Access to Financing Products	0.531	7.666	0.000	Supported
H3 Access to Financing Products → MSME Performance	0.228	3.110	0.002	Supported
H4 Financial Literacy → Financial Risk Attitude	0.662	12.070	0.000	Supported
H5 Financial Risk Attitude → MSME Performance	0.233	3.528	0.000	Supported

Based on the results presented in Table 8, all five proposed hypotheses are supported, as their t-statistics exceed 1.96 and their p-values are below 0.05. Financial literacy has a positive and significant direct effect on MSME performance (H1), on access to financing products (H2), and on financial risk attitude (H4), the latter being the strongest path coefficient in the model (β = 0.662). Access to financing products (H3) and financial risk attitude (H5) each have a positive and significant effect on MSME performance. These findings indicate that, unlike models in which the mediating variables fully absorb the effect of the exogenous construct, financial literacy in this study continues to exert a strong and significant direct influence on MSME performance even after access to financing products and financial risk attitude are included in the model.

Mediation Effect Testing

Mediation testing was conducted using the bootstrapping procedure to evaluate the roles of access to financing products and financial risk attitude in mediating the relationship between financial literacy and MSME performance. The results are presented in Table 9.

Table 9 Mediation Analysis Results

Indirect Effect	Original Sample (O)	T Statistics	P Values	Result
LK → APP → KU	0.121	2.988	0.003	Supported
LK → SRK → KU	0.154	3.231	0.001	Supported
LK → KU (total indirect effect)	0.275	3.983	0.000	Supported

Based on Table 9, both access to financing products and financial risk attitude significantly mediate the relationship between financial literacy and MSME performance, with specific indirect effects of 0.121 (through access to financing products) and 0.154 (through financial risk attitude), and a combined total indirect effect of 0.275 ($t = 3.983$, $p < 0.001$). Because the direct effect of financial literacy on MSME performance (H1: $\beta = 0.456$, $p = 0.000$) also remains significant alongside these significant indirect effects, access to financing products and financial risk attitude are found to act as partial mediators specifically, complementary partial mediators, since the direct and indirect effects are both positive and point in the same direction (Hair et al., 2022). In other words, financial literacy improves the performance of Padang restaurant MSMEs both directly and indirectly, with the indirect pathways operating through improved access to financing and a more rational financial risk attitude.

DISCUSSION

The findings indicate that financial literacy has a positive and significant direct effect on the performance of Padang restaurant MSMEs in Bandung City. This result is consistent with the Resource-Based View (Barney, 1991; Wernerfelt, 1984), which holds that financial literacy functions as a valuable and difficult-to-imitate intangible resource that enables business actors to manage working capital, control cash flow, and make sound financial decisions, thereby directly strengthening business performance. This finding is also in line with Buchdadi et al. (2020), who explained that a good level of financial literacy among MSME actors is associated with stable business performance through efficient management of capital and cash flow, and with Yuliani et al. (2025), who found that improved financial literacy encourages business actors to make wiser financial decisions with a positive impact on small-business performance.

The results further show that financial literacy has a strong positive effect on access to financing products, consistent with Ferli (2023) and Rahayu (2022), who found that financially literate business actors are more confident and proactive in seeking and selecting financing products suited to their business needs. Access to financing products, in turn, has a significant positive effect on MSME performance, supporting Anthanasius Fomum & Opperman (2023) and Susanti and Putra (2025), who emphasized that easier access to financing enables business actors to strengthen working capital and expand their operations.

Financial literacy is also found to have the strongest effect in the model on financial risk attitude, in line with Susanti and Putra (2025) and Masdupi et al. (2024), who argued that financially literate individuals are better able to evaluate the potential gains and losses of a financial decision, resulting in a more rational and calibrated risk attitude. Financial risk attitude, in turn, positively affects MSME performance, consistent with Sukmana (2024) and Buchdadi et al. (2020), suggesting that Padang restaurant owners who are willing to take calculated risks are more responsive to business opportunities, such as menu innovation, outlet expansion, or adoption of digital ordering platforms.

An important finding of this study is that the direct effect of financial literacy on MSME performance remains strong and significant even after accounting for access to financing products and financial risk attitude. Access to financing products and financial risk attitude were found to act as complementary partial mediators rather than full mediators. This suggests that, among Padang restaurant MSME owners in Bandung City, financial literacy improves business performance not only by shaping more favorable access to financing and a more rational risk attitude, but also directly, through more effective day-to-day financial management, cost control, and decision-making activities that do not necessarily require external financing or an explicit risk-taking decision to translate into better business outcomes.

Overall, the structural model demonstrates a good level of fit (SRMR = 0.048) and reasonably strong explanatory power, with financial literacy, access to financing products, and financial risk attitude jointly explaining 60.3% of the variance in MSME performance. These findings reinforce the Resource-Based View perspective that internal, intangible resources such as financial literacy together with a business actor's ability to convert that literacy into external resources (financing access) and calibrated risk-taking behavior jointly determine the competitiveness and performance of Padang restaurant MSMEs in Bandung City.

CONCLUSION

This study examined the effect of financial literacy on the performance of Padang restaurant MSMEs in Bandung City, with access to financing products and financial risk attitude as mediating variables. Based on data from 155 respondents analysed using PLS-SEM, all five proposed hypotheses are supported. Financial literacy has a positive and significant effect on MSME performance, on access to financing products, and on financial risk attitude, while both access to financing products and financial risk attitude have positive and significant effects on MSME performance. Mediation testing further shows that both mediating variables carry significant indirect effects, and because the direct effect of financial literacy remains significant, the two variables function as complementary partial mediators rather than full mediators. Together, the three predictors explain 60.3% of the variance in MSME performance.

Theoretically, these findings extend the Resource-Based View by showing that financial literacy operates as an intangible internal resource that improves performance not only directly, but also through a business actor's capacity to convert that literacy into external resources (financing access) and into a more calibrated pattern of risk-taking. Practically, the results suggest that literacy programmes for Padang restaurant MSMEs will be more effective when they move beyond bookkeeping instruction to also cover the procedures and requirements of formal financing products and the assessment of business risk. For financial institutions and local government, the findings indicate that widening access to financing needs to be accompanied by literacy assistance if it is to translate into measurable performance gains.

This study has several limitations that suggest directions for further research. First, the data are cross-sectional and drawn from a single business type in a single city, so the results should be generalised with caution. Second, the use of purposive sampling means the sample is not statistically representative of the population of Padang restaurants in Bandung City. Third, all constructs were measured through self-reported perceptions collected from a single respondent per business using a single instrument, which raises the possibility of common method bias; future studies are encouraged to include a formal common method bias test or to draw on objective financial records. Fourth, several indicators of financial risk attitude capture saving behaviour and risk knowledge rather than risk preference along the risk-averse–risk-neutral–risk-seeking continuum, and two indicators of access to financing products (insurance ownership and preference for cooperative lending) capture constructs adjacent to financing access; refinement of these measures is recommended. Finally, this study reports R^2 and model fit but does not report effect size (f^2) or predictive relevance (Q^2); future research may include these measures, together with moderating variables such as business age, digital adoption, or entrepreneurial experience, to obtain a more complete picture of MSME performance formation.

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UNDERSTANDING CUSTOMER LOYALTY IN QRIS PAYMENT SYSTEMS: THE MEDIATING ROLES OF SATISFACTION AND TRUST AMONG GENERATION Z USERS OF ONLINE TRANSPORTATION SERVICES

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Abstract: *This study aims to examine the effects of perceived usefulness and perceived ease of use on customer loyalty in the use of QRIS payment systems within online transportation services, while considering the mediating roles of customer satisfaction and trust among Generation Z users. A survey method was employed, with data collected through an online questionnaire distributed to Generation Z users of QRIS payment systems in online transportation services. A total of 409 valid responses were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4 software. The findings reveal that perceived usefulness has a positive and significant effect on customer satisfaction and trust, while perceived ease of use positively and significantly influences perceived usefulness, customer satisfaction, and trust. Furthermore, customer satisfaction and trust were found to have positive and significant effects on customer loyalty. However, perceived usefulness and perceived ease of use did not exhibit significant direct effects on customer loyalty. The mediation analysis further indicates that customer satisfaction and trust fully mediate the relationships between perceived usefulness, perceived ease of use, and customer loyalty. This study contributes to the advancement of the Technology Acceptance Model (TAM) by providing empirical evidence on how customer loyalty toward QRIS payment systems is developed through satisfaction and trust mechanisms in the context of online transportation services.*

Keywords*: Customer Loyalty; Customer Satisfaction; Perceived Ease of Use; Perceived Usefulness; Trust.*

INTRODUCTION

The rapid advancement of digital technology has transformed payment systems across various sectors, particularly through the growing adoption of QRIS-based payment systems in online transportation services (Haikal et al., 2020). This transformation is closely aligned with the increasing adoption of information and communication technologies, which have fundamentally reshaped how individuals interact, conduct transactions, and access services in digital environments (Haikal et al., 2020; Kaur et al., 2023). Furthermore, advancements in digital service innovation have encouraged organizations to continuously improve service quality in order to enhance customer satisfaction and strengthen customer trust (Ajina et al., 2023). In this context, customer loyalty has emerged as a strategic factor, as it plays a crucial role in enhancing business sustainability, profitability, and competitive advantage (Latif et al., 2021; Wilson, 2019). However, despite the continued growth in digital payment adoption, customer loyalty has not consistently developed in parallel with usage rates. This phenomenon suggests a gap between initial adoption and long-term user commitment, where increased technology usage does not necessarily translate into strong customer loyalty, particularly in highly competitive service sectors such as online transportation services (Bhat et al., 2023; Peng et al., 2020; Wilson, 2019). Accordingly, the practical novelty of this study lies in its attempt to identify the psychological mechanisms that bridge the gap between initial technology adoption and long-term customer loyalty through the mediating roles of satisfaction and trust. The findings are expected to provide valuable insights for online transportation service providers and digital payment system operators in designing strategies that not only encourage the initial adoption of QRIS but also strengthen long-term customer loyalty, particularly among Generation Z users.

From a theoretical perspective, this study is grounded in the Technology Acceptance Model (TAM), which posits that perceived usefulness and perceived ease of use are the primary determinants of technology acceptance and usage (Davis, 1989). TAM has been widely applied to explain user behavior in the adoption of various technologies, including mobile services and e-commerce platforms (Ajina et al., 2023). Perceived usefulness refers to the extent to which users believe that a particular technology can enhance their performance or effectiveness, whereas perceived ease of use reflects the degree to which the technology is perceived as easy to learn and use (Davis, 1989). Moreover, prior studies have demonstrated that these two constructs play a significant role in shaping users' trust in technology and influencing their overall usage experience (Peng et al., 2020). In the context of digital payment adoption, empirical evidence from Pasaman & Hutauruk (2025) indicates that Generation Z and Millennials represent the most active user groups in QRIS transactions. The survey was conducted between March and August 2024 and involved 1,500 respondents, comprising 750 Generation Z respondents and 750 Millennial respondents. The findings revealed that approximately 38% of Generation Z respondents, equivalent to around 285 individuals, used QRIS in their daily activities. In comparison, approximately 25% of Millennial respondents, or about 188 individuals, reported using QRIS on a daily basis. These findings suggest that Generation Z exhibits a higher level of QRIS usage than Millennials, reflecting the generation's strong acceptance of digital payment technologies. Furthermore, the dominance of platforms such as GoPay, OVO, and ShopeePay reflects variations in users' perceptions of usefulness, ease of use, and trust across digital payment platforms. These findings underscore the strategic role of younger generations in accelerating the diffusion of digital payment systems and highlight the importance of understanding psychological factors, such as perceived ease of use, satisfaction, and trust, that contribute to the development of customer loyalty within the digital payment ecosystem. On the other hand, customer satisfaction is defined as a post-consumption evaluation that reflects users' experiences with a service (Wilson et al., 2021), whereas trust refers to the belief that a service provider is capable of fulfilling its promises and delivering reliable services (Bhat et al., 2023; Garepasha et al., 2021). Previous studies have also demonstrated that customer satisfaction and trust significantly influence customer loyalty across various digital service contexts (Bhat et al., 2023; Garepasha et al., 2021). However, most existing studies have examined these relationships in isolation and have yet to integrate TAM with relationship marketing constructs to comprehensively explain the formation of customer loyalty. Therefore, the theoretical novelty of this study lies in the development of an integrated framework that combines the perspectives of TAM and relationship marketing through a dual mediation mechanism involving customer satisfaction and trust to explain customer loyalty formation in the context of QRIS-based digital payment systems.

Based on these research gaps, this study aims to examine the effects of perceived usefulness and perceived ease of use on customer loyalty toward QRIS payment systems in online transportation services, while considering the mediating roles of customer satisfaction and trust among Generation Z users. Conceptually, perceived usefulness and perceived ease of use not only influence technology usage intentions but also contribute to the development of customer satisfaction and trust, which ultimately shape customer loyalty (Keni, 2020; Wilson, 2019). Furthermore, prior research has shown that customer satisfaction serves as a key determinant of loyalty by fostering sustained positive experiences (Garepasha et al., 2021), while trust strengthens long-term relationships between users and service providers (Bhat et al., 2023). This study seeks to explain how perceived usefulness and perceived ease of use contribute to customer loyalty through the mediating mechanisms of satisfaction and trust. Therefore, this research not only investigates the direct effects of technology-related perceptions but also explores the underlying psychological processes that drive customer loyalty in the context of digital payment systems. The methodological novelty of this study lies in the examination of a TAM-based structural model through a dual mediation framework involving customer satisfaction and trust within the context of QRIS payment system usage among Generation Z users. This approach is expected to provide more contextualized empirical insights into the determinants of customer loyalty in digital payment technologies.

Technology Acceptance Model and Customer Loyalty in QRIS Payment Systems among Generation Z

The Technology Acceptance Model (TAM) remains one of the most prominent theoretical frameworks for explaining the adoption of digital payment technologies, particularly the use of QRIS payment systems in online transportation services. Within this framework, perceived usefulness (PU) and perceived ease of use (PEOU) are conceptualized as core cognitive beliefs that shape users' evaluations of a technological system (Davis, 1989). In the context of app-based services, PU extends beyond functional benefits such as transaction efficiency and speed to encompass instrumental value that enhances a more convenient and integrated travel experience within the mobile payment ecosystem (Agarwal & Chua, 2020; Chen et al., 2023). This perspective is consistent with the evolution of QRIS payment systems, which enable the integration of multiple payment methods within a single digital platform, thereby improving transaction convenience and flexibility for users (Chen et al., 2023). On the other hand, PEOU serves as a facilitating factor that reduces usage barriers and strengthens users' perceived control over the system. Previous studies have indicated that PU tends to exert a more dominant influence than PEOU in shaping positive user evaluations, although both constructs remain complementary in establishing the perceived value of technology (Nuralam et al., 2024; Wilson et al., 2021). In the case of Generation Z, whose preferences are strongly characterized by speed, application integration, and instant system responsiveness, the perceived benefits of QRIS are likely to play a more decisive role than interface simplicity alone in influencing technology evaluations and adoption decisions (Keni, 2020; Wilson, 2019).

Beyond the utilitarian dimensions of technology adoption, the relationship between technology perceptions and customer loyalty is not always direct. Consequently, customer satisfaction and trust serve as important mediating mechanisms that explain how cognitive evaluations are transformed into relational commitment. Customer satisfaction reflects a post-usage evaluation of the extent to which actual experiences meet users' expectations, whereas trust refers to confidence in the reliability, integrity, and security of a payment system (Morgan & Hunt, 1994). More critically, within digital payment environments characterized by inherent risks, trust often possesses greater explanatory power than satisfaction because it is closely associated with balance security, transaction accuracy, and personal data protection. Previous studies by Amin et al., (2014), Sitorus & Yustisia, (2018), and Wilson et al., (2021) demonstrated that perceived usefulness and perceived ease of use enhance trust and customer satisfaction by reducing uncertainty, increasing users' sense of control, and ensuring consistent system performance. For Generation Z users, heightened sensitivity to application errors, delayed notifications, and potential data breaches makes trust not merely an outcome of technology usage but a fundamental psychological prerequisite for the sustained development of customer satisfaction (Keni, 2020; Wilson, 2019).

Customer loyalty in QRIS-based digital payment services is defined as a recurring commitment to continue using the same payment method despite the availability of alternative options, such as digital wallets, instant bank transfers, and cash payments (Oliver, 1999). From a critical perspective, customer loyalty among Generation Z is not solely derived from rational evaluations of usefulness and ease of use, but also from the accumulation of positive experiences that reinforce usage habits, psychological attachment, and resistance to switching to alternative payment methods. Empirical studies have shown that the direct effects of perceived usefulness and perceived ease of use on customer loyalty tend to diminish when customer satisfaction and trust are incorporated as mediating variables, suggesting that affective-relational pathways possess greater explanatory power than direct cognitive pathways (Keni, (2020); Nuralam et al., (2024); Wilson et al., (2021)). In the context of QRIS payment systems within online transportation services, customer loyalty is more likely to emerge from consistently fast, secure, seamless, and widely accepted transaction experiences across multiple merchants rather than from users' initial perceptions of technological features alone (George & Kumar, (2013); Wilson, (2019)). Therefore, customer loyalty is shaped not only by cognitive perceptions of technological usefulness and ease of use but also through mediation processes involving customer satisfaction and trust as affective-relational mechanisms. This perspective provides a more comprehensive understanding of Generation Z's loyalty behavior toward QRIS payment systems within the context of online transportation services.

The Effect of Perceived Usefulness on Customer Satisfaction

Within the Technology Acceptance Model (TAM), perceived usefulness (PU) is conceptualized as users' cognitive evaluation of the benefits derived from using a particular technology (Davis, 1989). When a system provides tangible functional value, users are more likely to develop favorable evaluations of their usage experience, which can ultimately enhance their level of satisfaction. Customer satisfaction itself refers to an affective evaluation that emerges when individuals compare the actual performance of a product or service with their initial expectations (Kotler & Keller, 2016). Empirical evidence has consistently shown that users who perceive substantial benefits from a technological system tend to evaluate their overall experience more positively. Wilson et al. (2021) found that perceived usefulness significantly enhances customer satisfaction in technology-based service settings. Similar findings were reported by Amin et al. (2014), who demonstrated that perceived usefulness positively influences customer satisfaction in the context of mobile website services. However, Nuralam et al. (2024) suggested that under certain circumstances, perceived usefulness may not serve as the primary determinant of satisfaction, as its influence can be affected by contextual factors such as service quality and user characteristics. Nevertheless, based on the dominant empirical evidence and the theoretical rationale provided by the Technology Acceptance Model, greater perceived benefits from a technology are expected to lead to higher levels of customer satisfaction. Therefore, the following hypothesis is proposed:

H1: Perceived Usefulness positively affects Customer Satisfaction.

The Effect of Perceived Usefulness on Trust

From the perspective of integrating the Technology Acceptance Model (TAM) and trust theory, perceived usefulness functions as a value signal that reduces uncertainty and strengthens users' confidence in a technological system. When a technology consistently delivers tangible benefits, users are more likely to perceive the system as reliable, secure, and trustworthy. Nuralam et al. (2024) found that perceived usefulness positively influences trust in the context of mobile commerce. Similarly, Amin et al. (2014) reported that perceived benefits have a significant impact on the development of trust in mobile service users. Furthermore, Kenyta (2022) demonstrated that perceived usefulness contributes to strengthening users' confidence in online transactions. Nevertheless, several studies have suggested the existence of a reciprocal relationship, whereby users' initial level of trust may also influence the formation of perceived usefulness toward a technology. Despite this possibility, the majority of the literature identifies perceived usefulness as a key antecedent of trust, making this relationship particularly relevant to examine in the context of QRIS payment system usage within online transportation services. Therefore, the following hypothesis is proposed:

H2: Perceived Usefulness positively affects Trust.

The Effect of Perceived Ease of Use on Perceived Usefulness

Within the Technology Acceptance Model (TAM), perceived ease of use (PEOU) refers to the extent to which a technology can be used effortlessly and without requiring substantial effort from its users. The easier a system is to operate, the more likely users are to perceive the tangible benefits offered by the technology (Davis, 1989). In TAM, perceived ease of use not only directly influences users' behavioral intentions but also affects perceived usefulness. From a theoretical perspective, a system that is easier to use enables users to focus more effectively on task completion, thereby making its benefits more apparent and easier to recognize. Davis (1989) demonstrated that ease of use contributes significantly to the enhancement of perceived usefulness. This finding is further supported by Nuralam et al. (2024) and Amin et al. (2014), who identified perceived ease of use as a significant predictor of perceived usefulness in the contexts of mobile commerce and online shopping. Nevertheless, under certain conditions, such as technical limitations, system disruptions, or features that do not align with users' needs, ease of use may not automatically translate into greater perceived usefulness. This suggests that the relationship between perceived ease of use and perceived usefulness may also be influenced by the usage context and the characteristics of the adopted technology. However, the existing literature generally demonstrates a positive and consistent relationship between perceived ease of use and perceived usefulness. Therefore, the following hypothesis is proposed:

H3: Perceived Ease of Use positively affects Perceived Usefulness.

The Effect of Perceived Ease of Use on Customer Satisfaction

Perceived ease of use contributes to the development of a positive user experience, as systems that are easy to use reduce frustration, operational errors, and users' cognitive burden. In technology-based service environments, ease of use enables users to interact with the system more efficiently, thereby fostering more favorable evaluations of their overall experience (Davis, 1989). Customer satisfaction is achieved when actual experiences meet or exceed users' expectations (Kotler & Keller, 2016). Within the context of technology-enabled services, ease of use represents a critical factor shaping users' overall evaluations of a service. Nuralam et al. (2024) found that perceived ease of use positively influences customer satisfaction in online service settings. Similarly, Amin et al. (2014) reported that ease of use significantly enhances customer satisfaction in the context of mobile website services. Furthermore, Wilson et al. (2021) demonstrated that system usability contributes positively to users' evaluations of technology-based services. However, Ashfaq et al. (2019) found that the effect of perceived ease of use on customer satisfaction is not always significant and may vary depending on user characteristics and research contexts. Despite these variations in empirical findings, the majority of the literature suggests that perceived ease of use remains a key determinant of positive user experiences and higher levels of customer satisfaction in technology-based services. Therefore, the positive relationship between perceived ease of use and customer satisfaction remains relevant for examination in the context of QRIS payment system usage within online transportation services. Accordingly, the following hypothesis is proposed:

H4: Perceived Ease of Use positively affects Customer Satisfaction.

The Effect of Perceived Ease of Use on Trust

In the context of digital services, perceived ease of use (PEOU) is regarded as a factor that reduces uncertainty, enhances users' sense of control, and minimizes perceived risks during interactions with a technological system. When a technology is easy to understand and operate, users are more likely to perceive it as reliable and worthy of trust (Davis, 1989). Trust theory in online environments suggests that trust develops when users perceive a system as dependable and free from complexity or ambiguity (Gefen et al., 2003). Empirical evidence has consistently demonstrated that perceived ease of use contributes positively to the development of trust. Wilson et al. (2021) found that ease of use enhances user trust in mobile commerce settings. Similarly, Amin et al. (2014) reported that perceived ease of use has a significant positive effect on trust in mobile website services. Furthermore, Kenyta (2022) showed that systems that are easier to use tend to strengthen users' confidence in the integrity and competence of service providers. Nevertheless, several studies have suggested that in high-risk environments, trust may be influenced more strongly by factors such as security and organizational reputation than by ease of use alone. Despite this, the majority of the literature identifies perceived ease of use as an important mechanism in trust formation because it reduces cognitive barriers, enhances users' sense of control, and lowers perceived risk. Therefore, the positive relationship between perceived ease of use and trust remains relevant for examination in the context of QRIS payment system usage within online transportation services. Accordingly, the following hypothesis is proposed:

H5: Perceived Ease of Use positively affects Trust.

The Effect of Customer Satisfaction on Customer Loyalty

From a relationship marketing perspective, customer satisfaction reflects users' positive evaluations of their service experiences after comparing actual performance with their initial expectations (Kotler & Keller, 2016). Within this theoretical framework, customer satisfaction is regarded as one of the primary antecedents of customer loyalty, as positive experiences encourage repurchase intentions and foster long-term commitment to a brand or service provider. Consistently positive experiences strengthen users' intentions to continue using a service and reinforce their long-term relationships with the provider. Oliver (1999) argued that customer loyalty develops through cognitive, affective, and conative stages that are rooted in sustained satisfaction experiences. Empirical evidence has widely supported the positive relationship between customer satisfaction and customer loyalty across various service contexts. Amin et al. (2014) found that customer satisfaction significantly influences customer loyalty in mobile service environments. Similarly, Wilson et al. (2021) demonstrated that customer satisfaction serves as a key determinant of loyalty in mobile commerce. Nevertheless, several studies suggest that satisfaction alone may not always be sufficient to generate customer loyalty, particularly when users have access to numerous comparable alternatives or when switching costs are relatively low. In the context of digital payment services, such conditions may encourage users to switch to competing platforms despite being satisfied with their current service. Despite these considerations, the mainstream literature consistently identifies customer satisfaction as a fundamental prerequisite for the development of customer loyalty. Therefore, the following hypothesis is proposed:

H6: Customer Satisfaction positively affects Customer Loyalty.

The Effect of Trust on Customer Loyalty

From a relationship marketing perspective, trust reflects users' confidence that a service provider will act consistently, reliably, and in accordance with customers' expectations (Gefen et al., 2003). Trust serves as a fundamental basis for building long-term relationships because it reduces perceived risk and strengthens customers' commitment to the services they use. According to Morgan & Hunt (1994) Commitment-Trust Theory, trust is a key variable in maintaining enduring relational exchanges. Empirical evidence has consistently demonstrated the positive influence of trust on customer loyalty. Gefen et al. (2003) found that trust enhances repurchase intentions in e-commerce settings. Similarly, Amin et al. (2014) reported that trust significantly influences customer loyalty in mobile service environments. Furthermore, studies in electronic commerce have shown that higher levels of trust encourage stronger commitment and sustained intentions toward service providers. Nevertheless, several studies suggest that the influence of trust on customer loyalty may operate through mediating mechanisms, such as customer satisfaction or commitment, meaning that its direct effect is not always the most dominant pathway. Despite this, the majority of the literature continues to identify trust as one of the primary determinants of customer loyalty, particularly in digital service environments characterized by uncertainty and perceived risk. Therefore, the following hypothesis is proposed:

H7: Trust positively affects Customer Loyalty.

The Effect of Perceived Usefulness on Customer Loyalty

From the perspective of technology-driven consumer behavior, perceived usefulness (PU) refers to the tangible benefits that users derive from utilizing a technological system, which may ultimately encourage continued usage and long-term commitment to a service. When a technology consistently delivers functional value, users are more likely to maintain their use of the service despite the availability of alternative options (Davis, 1989). Customer loyalty itself is defined as a deeply held commitment to repurchase or consistently reuse a preferred product or service in the future, despite situational influences and competing alternatives (Oliver, 1999). Empirical studies have provided evidence that perceived usefulness contributes directly to customer loyalty. Amin et al. (2014) found that perceived benefits exert a positive and significant effect on customer loyalty in the context of mobile services. Similarly, Wilson et al. (2021) demonstrated that perceived usefulness enhances continuance intention, which represents a behavioral manifestation of customer loyalty. Furthermore, in the e-commerce context, Gefen et al. (2003) indicated that when users perceive high utilitarian value from a system, they are more likely to maintain their relationship with the service provider. Nevertheless, several studies suggest that the influence of perceived usefulness on customer loyalty often operates through mediating mechanisms such as customer satisfaction or trust, causing the direct relationship to weaken in certain structural models. Despite this, perceived usefulness remains conceptually recognized as an important determinant of customer commitment and the continued use of digital services. Therefore, the following hypothesis is proposed:

H8: Perceived Usefulness positively affects Customer Loyalty.

The Effect of Perceived Ease of Use on Customer Loyalty

In the context of digital services, perceived ease of use (PEOU) reflects the extent to which users perceive a system as easy to interact with, thereby creating a more convenient, efficient, and seamless user experience. When a technology can be used easily and consistently, users are more likely to continue using the service over time (Davis, 1989). Customer loyalty is reflected in users' willingness to continue using a service and recommend it to others (Oliver, 1999). Several studies have supported the existence of a positive relationship between perceived ease of use and customer loyalty. Wilson et al. (2021) found that ease of use contributes to continuance intention in mobile commerce environments. Similarly, Amin et al. (2014) reported that perceived ease of use significantly influences customer loyalty in mobile service settings.

Furthermore, Nuralam et al. (2024) demonstrated that simple and frictionless user experiences increase the likelihood of customers remaining loyal to the same platform. Nevertheless, some studies suggest that the effect of perceived ease of use on customer loyalty is often mediated by perceived usefulness, trust, or customer satisfaction, causing its direct effect to become weaker when these variables are simultaneously incorporated into a structural model. Despite this, perceived ease of use remains theoretically recognized as a fundamental factor that fosters user attachment and supports the continuity of relationships with digital services. Therefore, the positive relationship between perceived ease of use and customer loyalty remains relevant for examination in the context of QRIS payment system usage within online transportation services. Accordingly, the following hypothesis is proposed:

H9: Perceived Ease of Use positively affects Customer Loyalty.

Based on the theoretical review and hypothesis development, the research model employed in this study is presented in Figure 1.

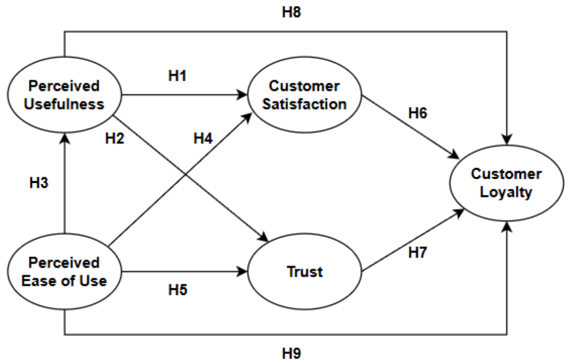

Figure 1 Research Model

METHODOLOGY

This study employed a quantitative approach using a survey method. The sampling process was conducted through a non-probability sampling technique, specifically purposive sampling. This technique was selected because respondents were required to meet specific criteria relevant to the objectives of the study. The respondents were Generation Z users of online transportation services, aged between 14 and 29 years, who had used the QRIS payment feature at least three times within the previous three months. Data were collected through an online survey using a structured questionnaire distributed via social media platforms, including WhatsApp and Instagram. An online survey method was chosen due to its effectiveness in reaching Generation Z, a demographic group characterized by high levels of internet and digital platform usage. Prior to completing the questionnaire, respondents were screened through a set of filtering questions to ensure that they met all research criteria.

According to Hair et al. (2010), the minimum sample size for SEM-based studies can be determined based on the number of indicators used, ranging from five to ten times the total number of indicators. This study employed 19 indicators; therefore, the recommended minimum sample size was 133 respondents (19 × 7). Through the data collection process, a total of 409 valid responses were obtained and included in the analysis. This sample size exceeded the recommended minimum threshold and was considered adequate for PLS-SEM analysis, which is relatively robust when applied to small-to-medium sample sizes.

Data were collected using a structured questionnaire adapted from relevant prior studies. All measurement items were assessed using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The details of the measurement indicators and their corresponding sources are presented in Table 1. The measurement instrument was adapted from Wilson et al. (2021).

Table 1 Measurement Indicators

Variable	Indicator	Description
Perceived Usefulness (PU)	PU1	The QRIS payment system in online transportation services makes my transaction process more effective.
	PU2	The QRIS payment system in online transportation services helps me complete payments more quickly and efficiently.
	PU3	The QRIS payment system in online transportation services provides tangible benefits that I experience in my daily transactions.
Perceived Ease of Use (PEOU)	PEOU1	I find the QRIS payment system in online transportation services easy to understand from the first time I use it.
	PEOU2	I do not experience difficulties in learning how to use the QRIS payment system in online transportation services.
	PEOU3	Overall, the QRIS payment system in online transportation services is easy to use.
Trust (TRU)	TRU1	I believe that the QRIS payment system in online transportation services is secure to use.
	TRU2	The information provided about the QRIS payment system in online transportation services is clear and trustworthy.
	TRU3	The QRIS payment system in online transportation services performs as promised.
	TRU4	I consider the QRIS payment system in online transportation services to have a good reputation.
Customer Satisfaction (SAT)	SAT1	My experience with the QRIS payment system in online transportation services meets my expectations.
	SAT2	I am satisfied with my experience of using the QRIS payment system in online transportation services.
	SAT3	My experience of using the QRIS payment system in online transportation services exceeds my expectations.
	SAT4	I believe that choosing to use the QRIS payment system in online transportation services was the right decision.
Customer Loyalty (LOY)	LOY1	I intend to continue using the QRIS payment system in online transportation services in the future.
	LOY2	I am willing to recommend the QRIS payment system in online transportation services to my friends.
	LOY3	I am willing to recommend the QRIS payment system in online transportation services to my family members.
	LOY4	I share positive opinions about the QRIS payment system in online transportation services with others.
	LOY5	I encourage others to use the QRIS payment system in online transportation services.

Data Analysis Method

The collected data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with the assistance of the latest version of SmartPLS software. This method was selected because of its ability to analyze complex relationships among latent variables, including direct effects, indirect effects, and mediation relationships (Hair et al., 2011).

The analysis was conducted through the evaluation of the measurement model (outer model) to assess construct validity and reliability, followed by the evaluation of the structural model (inner model) to examine the relationships among the latent variables. Hypothesis testing was performed based on path coefficients, t-statistics, and p-values. Relationships were considered statistically significant when the t-statistic exceeded 1.96 and the p-value was below

0.05 (Hair et al., 2011). Furthermore, mediation effects were assessed using the bootstrapping procedure to evaluate the significance of indirect effects.

RESULTS AND DISCUSSION

Respondent Characteristics

This study involved 409 respondents who met the criteria of being Generation Z users of QRIS payment systems within online transportation services. Based on gender, the majority of respondents were female (79%), while male respondents accounted for 21% of the sample. In terms of birth year, most respondents were born between 2001 and 2004 (72%), followed by those born between 2005 and 2009 (22%) and between 1997 and 2000 (6%). A detailed summary of the respondents' characteristics is presented in Table 2.

Table 2 Respondent Characteristics

Characteristics	Criteria	Frequency	Percentage
Gender	Male	84	21%
	Female	325	79%
Year of Birth	1997-2000	27	6%
	2001-2004	292	72%
	2005-2009	90	22%

Measurement Model

Following the analysis of respondent characteristics, the data were evaluated through the measurement model (outer model) to ensure that all constructs satisfied the required validity and reliability criteria. The measurement model was assessed by examining convergent validity and construct reliability based on outer loading values, Average Variance Extracted (AVE), Cronbach's Alpha, and Composite Reliability (Hair et al. 2011). An indicator was considered to have adequate convergent validity if its outer loading exceeded 0.70 and the corresponding construct achieved an AVE value greater than 0.50. Furthermore, a construct was deemed reliable when both its Cronbach's Alpha and Composite Reliability values exceeded the recommended threshold of 0.70.

Table 3. Measurement Model Analysis

Variable	Indicator	Factor Loading	Cronbach's Alpha	Composite Reliability	AVE
Perceived Usefulness	PU1	0.789	0.708	0.837	0.631
	PU2	0.786			
	PU3	0.809			
Perceived Ease of Use	PEOU1	0.748	0.710	0.837	0.632
	PEOU2	0.821			
	PEOU3	0.815			
Trust	TRU1	0.774	0.769	0.852	0.590
	TRU2	0.768			
	TRU3	0.768			
	TRU4	0.763			
Customer Satisfaction	SAT1	0.816	0.726	0.845	0.646
	SAT2	0.780			
	SAT4	0.814			
Customer Loyalty	LOY1	0.711	0.749	0.841	0.570
	LOY2	0.786			
	LOY3	0.783			
	LOY5	0.739			

Table 3 presents the results of the measurement model evaluation conducted to assess the validity and reliability of the research constructs. During the initial stage of analysis, two indicators exhibited outer loading values below the recommended threshold of 0.70, namely SAT3 (0.686) and LOY4 (0.645). Consequently, these indicators were removed from the research model to satisfy the requirements of convergent validity. Following the elimination process, all remaining indicators demonstrated outer loading values above 0.70, while all constructs achieved Average Variance Extracted (AVE) values exceeding 0.50, thereby meeting the criteria for convergent validity. Furthermore, the Cronbach's Alpha and Composite Reliability values for all constructs were above the recommended threshold of 0.70, indicating satisfactory construct reliability. Therefore, all constructs were considered valid and reliable and were deemed suitable for subsequent structural model analysis. In addition to convergent validity and construct reliability, discriminant validity was also assessed to ensure that each construct was empirically distinct from the others. Discriminant validity was evaluated using the Fornell–Larcker criterion, and the results are presented in Table 4.

Table 4 Discriminant Validity Analysis (Fornell–Larcker Criterion)

	LOY	PEOU	PU	SAT	TRU
LOY	**0.755**				
PEOU	0.370	**0.795**			
PU	0.369	0.431	**0.795**		
SAT	0.523	0.518	0.491	**0.804**	
TRU	0.435	0.435	0.423	0.507	**0.768**

Based on Table 4, the results indicate that all constructs satisfy the Fornell–Larcker criterion, confirming that discriminant validity is established and acceptable.

In addition to the Fornell–Larcker criterion, discriminant validity was further assessed using the Heterotrait–Monotrait Ratio (HTMT), with a recommended threshold value of < 0,90 (Hair et al., 2019). The results of the discriminant validity assessment using HTMT are presented in Table 5.

Table 5 Discriminant Validity Analysis (HTMT)

	LOY	PEOU	PU	SAT	TRU
LOY					
PEOU	0.504				
PU	0.502	0.598			
SAT	0.702	0.715	0.686		
TRU	0.568	0.585	0.572	0.670	

Based on Table 5, all HTMT values are below the recommended threshold of 0.90. The highest HTMT value is observed between Perceived Ease of Use and Customer Satisfaction (0.715), whereas the lowest value is found between Perceived Usefulness and Customer Loyalty (0.502). These results indicate that all constructs satisfy the discriminant validity criterion and are empirically distinct from one another within the research model.

Structural Model Evaluation

After the measurement model (outer model) satisfied the validity and reliability requirements, the next step involved evaluating the structural model (inner model) to examine the relationships among the constructs in the proposed research model. The structural model evaluation included assessments of model fit, path coefficients, coefficients of determination (R^2), and mediation effects using the bootstrapping procedure. The results of these analyses are presented in Tables 6, 7, and 8.

Table 6 Model Fit Analysis

Indicator	Value	Criterion	Interpretation
SRMR	0.080	<0.10	Fit
NFI	0.720	Close to 1	Fit

Table 7 Path Coefficient Result

Path Coefficient	Original sample (O)	T statistics (|O/STDEV|)	P values	Result
PU → SAT	0.328	5.543	0.000	Significant
PU → TRU	0.290	4.718	0.000	Significant
PEOU → PU	0.431	5.421	0.000	Significant
PEOU → SAT	0.377	6.432	0.000	Significant
PEOU → TRU	0.311	5.091	0.000	Significant
SAT → LOY	0.347	6.258	0.000	Significant
TRU → LOY	0.192	3.736	0.000	Significant
PU → LOY	0.089	1.523	0.064	No Significant
PEOU → LOY	0.068	1.189	0.117	No Significant

Table 8 Coefficient of Determination (R^2)

Dependent Variable	R-square	R-square adjusted
PU	0.186	0.184
TRU	0.258	0.254
SAT	0.356	0.353
LOY	0.323	0.316

Based on the model fit assessment presented in Table 6, the SRMR value of 0.080 indicates that the proposed model satisfies the recommended model fit criterion. In addition, the NFI value of 0.720 suggests an acceptable level of model fit. Therefore, the proposed research model is considered adequate for examining the relationships among the constructs included in this study.

The path coefficient results presented in Table 7 indicate that perceived usefulness has a positive and significant effect on both customer satisfaction and trust. Furthermore, perceived ease of use exerts a positive and significant influence on perceived usefulness, customer satisfaction, and trust. The findings also reveal that customer satisfaction and trust have positive and significant effects on customer loyalty. However, the direct effects of perceived usefulness on customer loyalty and perceived ease of use on customer loyalty are not statistically significant.

Based on the coefficient of determination (R2) results presented in Table 8, the R2 values for Perceived Usefulness, Trust, Customer Satisfaction, and Customer Loyalty are 0.186, 0.258, 0.356, and 0.323, respectively. These values indicate that the model explains 18.6% of the variance in Perceived Usefulness, 25.8% of the variance in Trust, 35.6% of the variance in Customer Satisfaction, and 32.3% of the variance in Customer Loyalty, while the remaining variance is attributable to factors not included in the research model. According to Hair et al. (2010), R2 values 0,75, 0,50, and 0,25 are categorized as substantial, moderate, and weak, respectively. Based on these criteria, the R2 values for Trust (0.258), Customer Satisfaction (0.356), and Customer Loyalty (0.323) fall within the weak category, as they range between 0.25 and 0.50. In contrast, the R2 value for Perceived Usefulness (0.186) falls below the weak threshold, indicating that the explanatory power of the independent variables for this construct is relatively limited. Nevertheless, the variables included in the model demonstrate predictive relevance in explaining the dependent constructs, suggesting that additional factors beyond those examined in this study may also influence QRIS usage behavior within online transportation services.

Hypothesis Testing

Hypothesis testing was conducted to determine whether the relationships proposed in the research model were supported by the PLS-SEM analysis results. The acceptance or rejection of each hypothesis was based on the t-statistic value, with a minimum threshold of 1.96 at a significance level of 5% (= 0,05). A hypothesis was considered supported when the t-statistic exceeded 1.96 and the p-value was less than 0.05 (Hair et al., 2011). Conversely, a hypothesis was considered unsupported when the t-statistic was below 1.96 and the p-value exceeded 0.05. The results of the hypothesis testing are presented in Table 9.

Table 9 Hypothesis Testing Results

	Hypothesis	Original sample (O)	T statistics (|O/STDEV|)	P values	Result
H1	Perceived Usefulness → Customer Satisfaction.	0.328	5.543	0.000	H1 Supported
H2	Perceived Usefulness → Trust.	0.290	4.718	0.000	H2 Supported
H3	Perceived Ease of Use → Perceived Usefulness.	0.431	5.421	0.000	H3 Supported
H4	Perceived Ease of Use → Customer Satisfaction.	0.377	6.432	0.000	H4 Supported
H5	Perceived Ease of Use → Trust.	0.311	5.091	0.000	H5 Supported
H6	Customer Satisfaction → Customer Loyalty.	0.347	6.258	0.000	H6 Supported
H7	Trust →Customer Loyalty.	0.192	3.736	0.000	H7 Supported
H8	Perceived Usefulness → Customer Loyalty.	0.089	1.523	0.064	H8 Not Supported
H9	Perceived Ease of Use → Customer Loyalty.	0.068	1.189	0.117	H9 Not Supported

Based on the hypothesis testing results presented in Table 9, seven out of the nine proposed hypotheses are supported, as their t-statistics exceed 1.96 and their p-values are below 0.05. The supported hypotheses include H1, H2, H3, H4, H5, H6, and H7. In contrast, H8 and H9 are not supported because their t-statistics are below 1.96 and their p-values exceed 0.05. These findings indicate that the direct effects of perceived usefulness and perceived ease of use on customer loyalty are not statistically significant in the context of this study.

Mediation Effect Testing

In addition to examining the direct relationships among the variables, this study also investigated indirect effects through mediation mechanisms. Mediation effect testing was conducted using the bootstrapping procedure to evaluate the roles of customer satisfaction and trust in mediating the relationships among the constructs in the proposed research model. The results of the mediation analysis are presented in Table 10.

Table 10 Mediation Analysis Results

Indirect Effect	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T statistics (|O/STDEV|)	P values	Result
PU→SAT→LOY	0.114	0.114	0.030	3.797	0.000	Supported
PU→TRU→LOY	0.056	0.056	0.020	2.751	0.003	Supported
PEOU→PU→SAT	0.141	0.140	0.044	3.215	0.001	Supported
PEOU→PU→TRU	0.125	0.124	0.043	2.872	0.002	Supported
PEOU→PU→LOY	0.038	0.037	0.027	1.400	0.081	Not Supported
PEOU→SAT→LOY	0.131	0.129	0.027	4.826	0.000	Supported
PEOU→TRU→LOY	0.060	0.059	0.020	2.994	0.001	Supported
PEOU→PU→SAT →LOY	0.049	0.049	0.019	2.587	0.005	Supported
PEOU→PU→TRU →LOY	0.024	0.024	0.012	2.037	0.021	Supported

Based on the results presented in Table 10, customer satisfaction and trust are found to mediate the relationships between perceived usefulness and customer loyalty, as well as between perceived ease of use and customer loyalty. The findings indicate that the indirect effects through these mediating variables are statistically significant, whereas the direct effects of perceived usefulness and perceived ease of use on customer loyalty are not significant. These results suggest that customer satisfaction and trust serve as important mechanisms through which perceived usefulness and perceived ease of use influence customer loyalty. Overall, the findings demonstrate that customer satisfaction and trust function as full mediators in the relationship between perceived usefulness and customer loyalty, and between perceived ease of use and customer loyalty, as evidenced by significant indirect effects alongside non-significant direct effects.

The findings indicate that perceived usefulness has a positive and significant effect on both customer satisfaction and trust in the use of QRIS payment systems within online transportation services. These results are consistent with the Technology Acceptance Model (TAM) proposed by Davis (1989), which posits that the greater the perceived benefits of a technology, the more favorable users' acceptance and evaluations of that technology will be. In the context of this study, users who perceive QRIS as enabling faster, more convenient, and more efficient transactions are more likely to experience higher levels of satisfaction and trust toward the service. These findings are also consistent with prior studies conducted by George & Kumar (2013), Wilson et al. (2021), Nuralam et al. (2024), and Amelia & Simanjuntak (2024), which demonstrated that the tangible benefits provided by a technology enhance user satisfaction. Furthermore, Orrange et al. (2021) dan Malhan et al. (2023) argued that positive user experiences and perceived benefits contribute significantly to the development of trust in digital services. Therefore, the ability of QRIS payment systems within online transportation services to deliver added value and improve transaction efficiency represents a critical factor in fostering both customer satisfaction and trust toward digital payment services.

The results further reveal that perceived ease of use has a positive and significant effect on perceived usefulness, customer satisfaction, and trust. These findings are consistent with the Technology Acceptance Model (TAM) proposed by Davis (1989), which suggests that technologies that are easy to understand and operate are more readily accepted by users and enhance perceptions of their usefulness. In the context of this study, the ease of using QRIS payment systems within online transportation services enables users to perceive the service as practical, efficient, and supportive of their daily transaction activities. Consequently, ease of use not only strengthens users' perceptions of the benefits offered by QRIS but also contributes to the development of customer satisfaction and trust toward the digital payment service. These findings are in line with previous studies by Wilson et al. (2021), Amin et al. (2014), Nuralam et al. (2024), Orrange et al. (2021), and Malhan et al. (2023), which demonstrated that the ease of using a technology enhances perceived usefulness, customer satisfaction, and trust in digital service environments.

The findings further indicate that customer satisfaction and trust have positive and significant effects on customer loyalty. These results suggest that users who are satisfied with and trust the QRIS payment system within online transportation services are more likely to continue using the service and maintain a long-term relationship with the provider. The findings are consistent with the view of Kotler & Keller (2016), who argued that customer satisfaction arising from service experiences that meet or exceed expectations contributes to the development of customer loyalty. Furthermore, Amelia & Simanjuntak (2024) and Malhan et al. (2023) emphasized that a high level of trust enhances customer commitment and increases the likelihood of continued service usage. The present findings are also in line with previous studies conducted by Wilson et al. (2021), Sitorus & Yustisia (2018), Nuralam et al. (2024), Kenyta (2022), Ajina et al. (2023), and Daud & Razak (2018), which highlighted the critical roles of satisfaction and trust in fostering customer loyalty toward digital services. In the context of this study, transaction experiences characterized by speed, convenience, security, and reliability through QRIS payment systems contribute to higher levels of customer satisfaction and trust, which subsequently strengthen customer loyalty toward digital payment services.

Another important finding of this study is that perceived usefulness and perceived ease of use do not exert direct effects on customer loyalty. However, both variables influence customer loyalty indirectly through customer satisfaction and trust. This finding suggests that the perceived benefits and ease of use of QRIS payment systems within online transportation services are not sufficient to directly foster user loyalty. Instead, these attributes first create positive user experiences that enhance satisfaction and trust, which subsequently translate into loyalty. This result supports the notion that the relationship between technology-related perceptions and loyalty is not solely driven by cognitive evaluations but also depends on affective and relational mechanisms. Therefore, the findings underscore the pivotal roles of customer satisfaction and trust as mediating mechanisms through which perceived usefulness and perceived ease of use contribute to the development of customer loyalty in the context of QRIS payment systems within online transportation services.

CONCLUSION

This study aimed to examine the effects of perceived usefulness and perceived ease of use on customer loyalty toward QRIS payment systems within online transportation services, while considering the mediating roles of customer satisfaction and trust among Generation Z users. The findings indicate that perceived usefulness has positive and significant effects on customer satisfaction and trust, whereas perceived ease of use positively and significantly influences perceived usefulness, customer satisfaction, and trust. In addition, customer satisfaction and trust are found to have positive and significant effects on customer loyalty. However, the direct effects of perceived usefulness and perceived ease of use on customer loyalty are not statistically significant. These findings suggest that the development of customer loyalty toward QRIS payment systems is influenced not only by the perceived benefits and ease of use of the technology but also by psychological processes reflected in users' satisfaction and trust. Accordingly, customer satisfaction and trust serve as full mediators in the relationships between perceived usefulness and customer loyalty, as well as between perceived ease of use and customer loyalty.

The findings suggest that enhancing customer loyalty toward QRIS payment systems requires more than simply improving the perceived usefulness and ease of use of the technology. Efforts to strengthen customer satisfaction and trust are equally important in fostering long-term loyalty. Therefore, providers of online transportation services should ensure that QRIS payment systems deliver secure, convenient, reliable, and user-centered transaction experiences that align with users' needs and expectations. By fostering higher levels of satisfaction and trust, service providers can strengthen customer loyalty, particularly among Generation Z, a demographic characterized by a high level of digital technology adoption.

Despite its contributions to understanding the formation of customer loyalty toward QRIS payment systems within online transportation services, this study has several limitations that should be considered when interpreting the findings and designing future research. First, the study focuses exclusively on Generation Z respondents, which limits the generalizability of the findings to other generational cohorts. Second, the research model incorporates only perceived usefulness, perceived ease of use, customer satisfaction, and trust as determinants of customer loyalty. Therefore, other factors that may influence loyalty toward QRIS payment systems remain unexplored. Future research is encouraged to broaden the respondent base by including different generational groups and to extend the model by incorporating additional relevant variables, such as perceived security, perceived risk, social influence, customer experience, and promotional incentives (e.g., discounts and cashback offers). Such efforts may provide a more comprehensive understanding of the factors influencing customer loyalty in the context of digital payment systems.

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MENCEGAH *TAX EVASION* DI SEKTOR PEKERJA MANDIRI: EVALUASI PEMAHAMAN, *SELF-ASSESSMENT SYSTEM*, DAN SANKSI PERPAJAKAN

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Abstract: *This study aims to analyze the influence of tax knowledge, the self-assessment system, and tax sanctions on tax evasion behavior among individual taxpayers engaged in independent professions. The compliance gap observed in the self-employed sector indicates a high vulnerability to tax evasion, necessitating a comprehensive evaluation of both behavioral and law enforcement aspects. An explanatory quantitative research method was employed, utilizing primary data collected via questionnaires. The sample consisted of 100 individual taxpayers in independent professions in Purworejo Regency, selected through simple random sampling. Multiple linear regression was used for data analysis. Empirical results demonstrate that tax knowledge, the effectiveness of the self-assessment system, and the severity of tax sanctions—both individually and simultaneously—significantly influence the mitigation of tax evasion tendencies. These findings confirm the relevance of the Theory of Planned Behavior and Deterrence Theory, illustrating how the synergy between tax literacy, self-reporting discipline, and the deterrent effect of sanctions fosters a conducive compliance ecosystem. From a practical standpoint, the study recommends that tax authorities optimize digital reporting education and ensure transparency in the enforcement of sanctions to mitigate tax evasion within the non-formal sector.*

Keywords*: Tax Compliance; Tax Understanding; Tax Sanctions; Self-Assessment System; Tax Evasion.*

PENDAHULUAN

Pajak merupakan mekanisme fiskal utama yang menopang pendapatan negara juga menjadi kontributor utama pembangunan nasional yang berkelanjutan (Mardjun & Sabijono, 2025; Prayitno et al., 2025; Sarmanto & Farina, 2021). Pada tahun fiskal 2024, realisasi penerimaan pajak Indonesia mencapai Rp1.932,4 triliun, mencapai 100,5% dari target yang ditetapkan sebelumnya dan mencerminkan pertumbuhan tahun-ke-tahunnya sebesar 3,5% (Kementerian Keuangan Republik Indonesia, 2025). Namun demikian, rasio penerimaan pajak terhadap Produk Domestik Bruto (tax ratio) Indonesia pada tahun 2024 hanya mencapai 10,07%, jauh lebih rendah dari rata-rata 20% di antara negara-negara Asia (Asosiasi Konsultan Pajak Indonesia, 2025). Perbedaan yang cukup besar ini menunjukkan bahwa potensi penerimaan pajak Indonesia sebagian besar masih belum optimal, sebagian besar disebabkan oleh terjadinya praktik tax evasion yang terus-menerus dilakukan di berbagai segmen wajib pajak.

Tax evasion merupakan tantangan kritis yang dihadapi otoritas pajak di hampir semua negara di seluruh dunia, termasuk Indonesia (Maron & Purwanti, 2025; Priscilla & Ngadiman, 2024). Fenomena ini tidak hanya berdampak buruk pada pendapatan negara dalam jangka pendek tetapi juga menimbulkan distorsi ekonomi yang luas, kesenjangan fiskal antara wajib pajak yang patuh dan tidak patuh, sehingga kepercayaan publik terhadap legitimasi keseluruhan sistem perpajakan melemah (Dahiya & Manni, 2024).

Meskipun penerapan mekanisme penghitungan pajak dilaksanakan dengan self-assesment system (penilaian diri) , realisasi kepatuhan wajib pajak terus menunjukkan ketidakseimbangan yang cukup besar, terutama dalam sektor ketenagakerjaan informal atau pekerjaan bebas. Menurut data dari Direktorat Jenderal Pajak (DJP), tingkat kepatuhan formal agregat, yang diukur dengan rasio penyerahan Surat Pemberitahuan Tahunan (SPT) pada tahun 2024, hanya mencapai 73,58%, menyisakan lebih dari seperempat wajib pajak terdaftar gagal memenuhi kewajiban pelaporan mereka (DJP, 2024). Lebih jauh lagi, akar ketidakpatuhan ini sangat menonjol pada kelompok Wajib Pajak Orang Pribadi (WPOP) Pekerjaan Bebas, yang mencakup kelompok pekerja informal atau pekerja bebas. Rasio kepatuhan mengenai pengajuan PPN dalam sektor tidak terikat ini telah dilaporkan sangat rendah, hanya 34,09% (DJP, 2022). Kontras antara tingkat kepatuhan karyawan formal—yang pajaknya secara otomatis dipotong oleh pemberi kerja—dan pekerja informal, yang harus secara independen menghitung dan mengirimkan pajak mereka, memberikan gambaran bahwa hal ini menyebabkan adanya celah yang tinggi terhadap praktik tax evasion.

Berbagai penelitian terdahulu secara empiris telah melihat berbagai faktor penentu yang secara signifikan mempengaruhi kecenderungan wajib pajak terlibat dalam tax evasion. Terutama, self-assessment system dan etika uang (money ethics) memberikan dampak signifikan pada perilaku tax evasion (Azhar et al., 2023). Selain itu, pemahaman perpajakan sangat penting dalam membentuk perilaku kepatuhan; wajib pajak yang memiliki pemahaman yang luas dan dalam tentang peraturan perpajakan terbukti lebih taat dan patuh dalam memenuhi kewajiban pajak mereka (Matshona et al., 2024; Ustantini et al., 2024). Kedua, penerapan self-assessment system yang efektif—yang mencerminkan sejauh mana wajib pajak mewujudkan prinsip-prinsip pelaporan diri yang jujur dan bertanggung jawab — menunjukkan korelasi negatif dengan niat untuk menghindari pajak (Leana & Kholis, 2022), selanjutnya dengan ditambahkan pengaruh moderasi agama, menghasilkan hasil yang serupa (Belananda, 2024). Ketiga, sanksi perpajakan berfungsi sebagai pencegah yang efektif; penegakan sanksi yang ketat dan konsisten telah terbukti mengurangi kecenderungan wajib pajak untuk melanggar peraturan perpajakan yang ada (Putra & Ginting, 2025; Rahmayanti et al., 2023).

Meskipun penelitian mengenai faktor yang mempengaruhi tax evasion telah banyak dilakukan di Indonesia, masih ada kekurangan literatur yang ada yang memerlukan eksplorasi lebih lanjut. Pertama, sebagian besar studi yang berlaku terutama berkonsentrasi pada pembayar pajak instansi atau WPOP sektor formal (Azhar et al., 2023; Bajri, 2024; Sriarwi et al., 2025; Zahro et al., 2023), sedangkan investigasi yang secara khusus menargetkan WPOP kerja bebas—kelompok demografis yang rentan terhadap ketidakpatuhan karena kurangnya mekanisme pemotongan pajak—tetap sangat langka. Kedua, penyelidikan empiris tentang tax evasion yang terjadi di daerah non-metropolitan jarang ditemui dalam literatur(Falhan & Hanum, 2023; Yonani, 2023), terlepas dari kemungkinan bahwa karakteristik demografis, tingkat literasi pajak, dan aksesibilitas layanan perpajakan di wilayah ini dapat secara signifikan berbeda dari sampel yang diamati di perkotaan. Ketiga, belum adanya penelitian yang secara bersamaan mengevaluasi dampak pemahaman pajak, self-assessment system, dan sanksi pajak dalam model tunggal yang kohesif berkaitan dengan konteks ini.

Mengingat kesenjangan tersebut, penelitian ini bertujuan untuk mengkaji dampak pemahaman pajak, self-assessment system, dan sanksi perpajakan terhadap tax evasion di antara WPOP yang terdaftar di Pos Pelayanan Pajak Kabupaten Purworejo. Kebaruan penelitian ini mencakup tiga aspek: (1) penekanan pada segmen wajib pajak pekerja informal, yang belum banyak dikaji secara mendalam pada konteks tax evasion; (2) pemilihan Kabupaten Purworejo sebagai daerah lokal perwakilan daerah non-metropolitan di Jawa Tengah, ditandai dengan karakteristik perpajakan lokal yang khas; dan (3) analisis simultan dari ketiga variabel prediktor dalam kerangka regresi linier berganda. Temuan penelitian ini diharapkan akan memberikan kontribusi teoritis untuk pengembangan model kepatuhan pajak berdasarkan Theory of Planned Behavior dan Deterrence Theory. Selain itu, dalam praktiknya, penelitian ini dapat menjadi rekomendasi untuk Pos Pelayanan Pajak Pratama Purworejo dalam menyusun strategi peningkatan kepatuhan perpajakan dan pengurangan praktik tax evasion di wilayah Kabupaten Purworejo dan sekitarnya yang berada di bawah naungan KPP Pratama Purworejo.

LANDASAN TEORI

Dua kerangka teoritis utama digunakan dalam penelitian ini. Pertama, Theory of Planned Behavior (Ajzen, 1991) yang menyatakan bahwa niat perilaku dipengaruhi oleh tiga elemen, yaitu: sikap, norma subyektif, dan kontrol perilaku yang dirasakan (Fayed, 2023; Nasri & Yusoff, 2025). Pemahaman perpajakan mewujudkan sikap yang mencerminkan kepatuhan pajak, self-assessment system menjadi persepsi kontrol perilaku, dan sanksi perpajakan merupakan norma subjektif bagi wajib pajak. Kedua, Deterrence Theory menggambarkan wajib pajak sebagai personal yang rasional yang memahami dengan baik beratnya hukuman ketika memutuskan untuk terlibat dalam tax evasion (Matshona et al., 2024; Miranda et al., 2023). Gabungan kedua teori ini menawarkan kerangka teoritis yang menyeluruh.

Tax Evasion

2 Tax Evasion

Tax Evasion didefinisikan sebagai tindakan terlarang yang sengaja dilakukan untuk mengurangi kewajiban pembayaran pajak yang terhutang (Bajri, 2024; Maron & Purwanti, 2025; Priscilla & Ngadiman, 2024). Secara fundamental, tax evasion berbeda dengan tax avoidance yang berada dalam batas-batas hukum. Tax evasion diukur melalui: (1) kejujuran dalam pelaporan pendapatan; (2)niat untuk menyembunyikan pendapatan; (3)manipulasi laporan keuangan; (4) kecenderungan untuk menunda pembayaran pajak penghasilan; dan (5) persepsi etis mengenai tax evasion (Leana & Kholis, 2022; Priscilla & Ngadiman, 2024).

Pemahaman Perpajakan

Pemahaman pajak didefinisikan sebagai kemampuan wajib pajak untuk memahami dan menerapkan peraturan perpajakan sebagai dasar untuk memenuhi kewajiban pajaknya (Rahmayanti et al., 2023; Yulia & Ratnasari, 2025). Pemahaman pajak dievaluasi melalui: kesadaran akan fungsi pajak, dasar hukum perpajakan, metodologi perhitungan PPN, prosedur pengajuan SPT, serta hak dan kewajiban wajib pajak (Bajri, 2024; Nasution & Purnamasari, 2023).

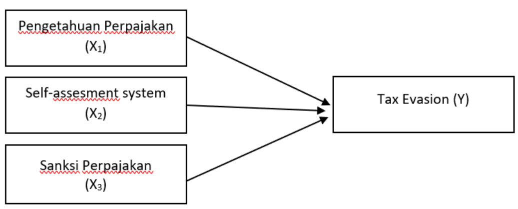
Sìelf-Assìessmìent Systìem

Self-assessment system adalah sistem pemungutan pajak yang memberikan wewenang penuh kepada wajib pajak untuk menghitung, menyetor, dan melaporkan pajak terutang secara mandiri (Ustantini et al., 2024) dengan efektivitas yang bergantung pada kesadaran, kejujuran, dan kedisiplinan wajib pajak (Indriana & Fauzan, 2025). Self-assessment system diukur melalui persepsi kemudahan pelaporan mandiri, kepercayaan sistem, transparansi prosedur, dan kemauan membayar pajak sesuai jumlah terutang.

Sanksi Perpajakan

Sanksi perpajakan merupakan instrumen deterrent yang menjamin kepatuhan wajib pajak(Latuheru & Loupatty, 2024; Rahmayanti et al., 2023). Berdasarkan UU KUP No. 16 Tahun 2009, sanksi mencakup sanksi administrasi (denda, bunga, kenaikan pajak) dan sanksi pidana. Sanksi perpajakan diukur melalui: persepsi ketegasan sanksi, pemahaman jenis sanksi, kesesuaian sanksi dengan tingkat pelanggaran, efek jera, dan kepastian pelaksanaan sanksi (Rahmayanti et al., 2023)

Kerangka Pemikiran:



Gambar 1. Kerangka Pemikiran

Hipotesis:
H1: Pemahaman perpajakan berpengaruh positif terhadap tax evasion.
H2: Self-assessment system berpengaruh positif terhadap tax evasion.
H3: Sanksi perpajakan berpengaruh positif terhadap tax evasion.
H4: Pemahaman perpajakan, self-assessment system, dan sanksi perpajakan berpengaruh positif terhadap tax evasion

METODE PENELITIAN

Penelitian ini menggunakan pendekatan kuantitatif dengan desain eksplanatori (explanatory research). Pendekatan ini diterapkan untuk menguji hipotesis serta menganalisis arah dan signifikansi hubungan kausalitas antara variabel independen dan variabel dependen secara objektif melalui prosedur statistic (Basri et al., 2023).

3.2 Populasi, Sampel, dan Teknik Sampling

Populasi sasaran dalam penelitian ini adalah seluruh Wajib Pajak Orang Pribadi (WPOP) Pekerjaan Bebas yang terdaftar di Pos Pelayanan Pajak Kabupaten Purworejo berdasarkan basis data tahun 2023, dengan jumlah total sebanyak 7.519 wajib pajak. Teknik pengambilan sampel dilakukan menggunakan metode acak sederhana (simple random sampling) (Triandayani et al., 2024). Ukuran sampel minimum ditentukan menggunakan rumus Slovin (Ramadhan et al., 2025) dengan tingkat toleransi kesalahan (margin of error) sebesar 10% (e = 0,10).

$$n = \frac{N}{(1+Ne^2)} \qquad (1)$$

Keterangan:
n = jumlah sampel minimum;
N = jumlah populasi (7.519);
e = tingkat toleransi kesalahan (0,10).

Dari perhitungan tersebut, menghasilkan kalkulasi sebanyak 99 responden. Guna mengantisipasi risiko kuesioner yang tidak kembali atau terisi tidak lengkap, jumlah sampel dibulatkan menjadi 100 responden demi menjaga kecukupan data uji statistik.

Data yang digunakan adalah data primer yang diperoleh langsung dari subjek penelitian melalui instrumen kuesioner. Kuesioner dirancang secara tertutup menggunakan skala Likert lima poin, dengan rentang skor dari 1 yang menyatakan "Sangat Tidak Setuju" (STS) hingga skor 5 yang menyatakan "Sangat Setuju" (SS). Pengumpulan data dilakukan secara daring dengan menyebarkan tautan kuesioner melalui media Google Form untuk mengoptimalkan efisiensi waktu dan memperluas jangkauan aksesibilitas responden.

Operasionalisasi variabel penelitian ini mencakup empat variabel, yaitu tiga variabel independen dan satu variabel dependen. Setiap variabel didefinisikan secara operasional dan diukur menggunakan indikator-indikator yang relevan berdasarkan kajian teori dan adaptasi dari instrumen penelitian terdahulu. Rincian definisi operasional, indikator, dan skala pengukuran masing-masing variabel disajikan pada Tabel 2 berikut:

Tabel 2. Definisi Operasional dan Pengukuran Variabel

Variabel	Definisi Operasional	Jumlah Item
Pemahaman Perpajakan (X_1)	Kemampuan wajib pajak dalam memahami dan mengimplementasikan peraturan perpajakan yang berlaku (Yuliani & Ratnasari, 2025)	5 item
Self-Assessment System (X_2)	Persepsi wajib pajak terhadap efektivitas penerapan sistem pelaporan pajak secara mandiri(Indriana & Fauzan, 2025)	5 item
Sanksi Perpajakan (X_3)	Persepsi wajib pajak tentang ketegasan, kepastian, dan efektivitas sanksi administratif maupun pidana perpajakan (Rahmayanti et al., 2023)	5 item
Tax Evasion (Y)	Intensi dan kecenderungan wajib pajak untuk melakukan penggelapan pajak secara ilegal (Priscilla & Ngadiman, 2024)	5 item

Instrumen penelitian yang digunakan adalah kuesioner tertutup yang disusun menggunakan Skala Likert lima poin. Setiap pernyataan dalam kuesioner memberikan pilihan respons dengan rentang skor 1 hingga 5, di mana interpretasinya disesuaikan dengan sifat pernyataan (positif atau negatif), sebagaimana ditunjukkan pada Tabel 3 berikut:

Tabel 3. Skala Pengukuran Kuesioner (Skala Likert 5 Poin)

Skor	Pernyataan Positif (X_1, X_2, X_3)	Pernyataan Negatif (Y)	Kategori
5	Sangat Setuju (SS)	Sangat Tidak Setuju (STS)	Sangat Tinggi
4	Setuju (S)	Tidak Setuju (TS)	Tinggi
3	Netral (N)	Netral (N)	Sedang
2	Tidak Setuju (TS)	Setuju (S)	Rendah
1	Sangat Tidak Setuju (STS)	Sangat Setuju (SS)	Sangat Rendah

Pernyataan untuk variabel independen (X_1, X_2, X_3) bersifat positif, di mana skor yang lebih tinggi mencerminkan tingkat pemahaman, efektivitas sistem, dan persepsi sanksi yang lebih baik. Sebaliknya, pernyataan untuk variabel dependen tax evasion (Y) bersifat negatif (reverse-coded), sehingga skor yang lebih rendah pada variabel ini mengindikasikan intensi yang lebih rendah untuk melakukan penggelapan pajak.

Analisis data dalam penelitian ini diolah dengan bantuan perangkat lunak statistik IBM SPSS melalui empat tahapan utama:

1. Uji Instrumen Penelitian: Validitas butir pernyataan diuji menggunakan analisis korelasi Pearson Product Moment, di mana instrumen dinyatakan valid jika nilai r hitung > r tabel Pengujian konsistensi internal kuesioner diukur

menggunakan uji reliabilitas Cronbach's Alpha dengan ambang batas minimum α > 60.

2. Uji Asumsi Klasik: Dilakukan untuk memastikan model regresi memenuhi kriteria kelayakan komputasi OLS (Ordinary Least Squares). Pengujian meliputi uji normalitas residual dengan metode Kolmogorov-Smirnov (K-S) , uji multikolinearitas melalui evaluasi nilai Variance Inflation Factor (VIF < 10) dan nilai Tolerance (> 0,10) , serta uji heteroskedastisitas dengan prosedur Uji Glejser.
3. Analisis Deskriptif Statistik: dilakukan untuk memberikan gambaran empiris mengenai sebaran data variabel penelitian yang meliputi Pemahaman Perpajakan (X1), Self-Assessment Ssystem (X2)Sanksi Perpajakan (X3), dan Tax Evasion (Y).
4. Analisis Regresi Linier Berganda: Digunakan sebagai teknik pemodelan statistik utama untuk mengestimasi besarnya pengaruh parsial maupun simultan dari beberapa variabel independen terhadap variabel dependen.
5. Pengujian Hipotesis: Pengujian signifikansi parameter dilakukan pada tingkat signifikansi α= 0,05. Uji-t digunakan untuk menguji pengaruh variabel independen secara parsial , sedangkan uji-F digunakan untuk menguji kelayakan model regresi dan pengaruh variabel bebas secara simultan. Kontribusi atau persentase variasi variabel independen dalam menjelaskan variabel dependen diukur melalui koefisien determinasi (R2 atau Adjusted R-Square).

HASIL DAN PEMBAHASAN

Gambaran Umum Respondìen

Penelitian ini melibatkan 100 responden yang tersebar di 15 kecamatan di Kabupaten Purworejo, dengan konsentrasi terbesar berada di Kecamatan Kutoarjo (18%), diikuti Kemiri (15%), Pituruh (14%), dan Bayan (11%), sementara kecamatan lainnya masing-masing berkontribusi kurang dari 10% dari total responden. Ditinjau dari jenis usaha, mayoritas responden bergerak di sektor perdagangan (58%), disusul kuliner (22%), jasa (13%), industri (5%), dan perikanan (2%), yang mencerminkan dominasi aktivitas ekonomi berbasis perdagangan di wilayah tersebut. Adapun berdasarkan lama usaha, lebih dari separuh responden (55%) telah menjalankan usahanya selama lebih dari lima tahun, diikuti kelompok usaha dengan durasi tiga hingga lima tahun (28%), dan satu hingga tiga tahun (17%), sehingga dapat disimpulkan bahwa responden dalam penelitian ini didominasi oleh pelaku usaha yang telah memiliki pengalaman usaha relatif matang, yakni lebih dari lima tahun.

Uji Instrumìen Pìenìelitian

Uji Validitas dan Reliabilitas

Evaluasi kualitas data diawali dengan uji validitas menggunakan korelasi Pearson Product Moment. Berdasarkan kriteria penerimaan di mana nilai r-hitung harus melebihi r-tabel (0,196 pada n=100, α = 0,05), hasil analisis menunjukkan bahwa seluruh indikator pada variabel Pemahaman Perpajakan (0,541–0,729), Self Assessment System (0,605–0,748), Sanksi Perpajakan (0,710–0,763), dan Tax Evasion (0,319–0,429) memiliki nilai r-hitung yang melampaui 0,196. Dengan demikian, seluruh butir pernyataan kuesioner dinyatakan valid secara statistik.

Selanjutnya, uji reliabilitas dilakukan dengan merujuk pada koefisien Cronbach's Alpha. Hasil pengujian mengindikasikan bahwa seluruh variabel memiliki koefisien di atas ambang batas minimum 0,70, yaitu Pemahaman Perpajakan (0,870), Self Assessment System (0,865), Sanksi

Perpajakan (0,876), dan Tax Evasion (0,931). Temuan ini mengonfirmasi bahwa instrumen penelitian memiliki tingkat keandalan dan konsistensi yang sangat baik untuk tahapan analisis berikutnya.

Uji Asumsi Klasik

Untuk memastikan kelayakan model regresi linier berganda dan memenuhi kriteria estimator yang tidak bias (Best Linear Unbiased Estimator/BLUE), serangkaian uji asumsi klasik diterapkan dengan penjabaran sebagai berikut:

1. Uji Normalitas: Pengujian normalitas residual melalui One-Sample Kolmogorov-Smirnov Test menghasilkan nilai signifikansi (Asymp. Sig. 2-tailed) sebesar 0,200. Karena nilai tersebut melebihi taraf signifikansi (α = 0,05), dapat disimpulkan bahwa data residual berdistribusi secara normal.
2. Uji Multikolinearitas: Hasil pengujian mengindikasikan ketiadaan korelasi yang kuat antarvariabel independen. Hal ini didukung oleh nilai Tolerance dari Pemahaman Perpajakan (0,265), Self Assessment System (0,243), dan Sanksi Perpajakan (0,262) yang melampaui 0,10. Selain itu, nilai Variance Inflation Factor (VIF) ketiga variabel tersebut (3,776; 4,110; dan 3,822) secara konsisten berada di bawah batas maksimum 10.
3. Uji Heteroskedastisitas: Deteksi gejala ini dilakukan secara objektif melalui Uji Glejser. Hasil regresi nilai absolut residual terhadap variabel independen menunjukkan probabilitas signifikansi untuk Pemahaman Perpajakan (0,593), Self Assessment System (0,526), dan Sanksi Perpajakan (0,589). Karena seluruh nilai berada di atas α = 0,05, varians residual terbukti konstan (homoskedastisitas). Kesimpulan statistik ini juga dikonfirmasi secara visual melalui pola penyebaran titik data yang acak pada grafik scatterplot.

Secara keseluruhan, hasil uji instrumen dan asumsi klasik menegaskan bahwa data primer penelitian ini valid, reliabel, dan terbebas dari bias prasyarat statistik. Oleh karena itu, data dinilai sangat layak untuk diproses pada tahap analisis regresi linier berganda.

Analisis Statistik Dìeskriptif

Analisis statistik deskriptif dilakukan untuk memberikan gambaran empiris mengenai sebaran data variabel penelitian yang meliputi Pemahaman Perpajakan (X1), Self-Assessment System (X2)Sanksi Perpajakan (X3), dan Tax Evasion (Y). Ringkasan hasil olah data deskriptif dari 100 responden disajikan pada Tabel berikut:

Tabel 4. Tabel Analisis Statistik Deskriptif

Variabel / Indikator	Min	Max	Mean	SD
Pemahaman Perpajakan (X1)			**4,21**	
X1.1 (Definisi & Fungsi Pajak)	3	5	4,25	716
X1.2 (Jenis-Jenis Pajak)	2	5	4,11	650
X1.3 (Mampu Menghitung PPh)	2	5	4,06	750
X1.4 (Pelaporan via e-Filing)	3	5	4,20	711
X1.5 (Batas Waktu Pajak)	3	5	**4,42**	622
***Self-Assessment System* (X2)**			**4,25**	
X2.1 (Inisiatif Daftar NPWP)	2	5	4,18	744
X2.2 (Akurasi Perhitungan Mandiri)	3	5	4,22	705
X2.3 (Penyetoran via e-Billing)	3	5	4,28	697
X2.4 (Pelaporan SPT Tahunan)	3	5	**4,29**	656
X2.5 (Kedisiplinan Waktu Lapor)	2	5	4,28	726
Sanksi Perpajakan (X3)			**4,27**	
X3.1 (Konsekuensi Pelanggaran)	2	5	4,31	748
X3.2 (Besaran Denda Rp100.000)	3	5	4,32	695
X3.3 (Ketegasan Aparat Pajak)	2	5	4,09	698

Variabel / Indikator	Min	Max	Mean	SD
X3.4 (Kesesuaian Regulasi Sanksi)	2	5	**4,36**	746
X3.5(Sanksi Bunga/Keterlambatan)	2	5	4,25	702
***Tax Evasion* (Y)**			**1,58**	
Y1 (Manipulasi Data Objek Pajak)	1	2	1,48	502
Y2 (Penyembunyian Penghasilan riil)	1	3	1,49	611
Y3 (Pengecilan Omzet Fiskal)	1	3	1,72	726
Y4 (Penyalahgunaan Hak NPWP)	1	3	1,76	638
Y5 (Kesengajaan Terlambat Lapor)	1	2	**1,47**	502

Berdasarkan Tabel 4 di atas, variabel-variabel independen dalam penelitian ini secara konsisten menunjukkan akumulasi skor persepsi yang tinggi. Variabel Pemahaman Perpajakan (X1) menghasilkan nilai rata-rata keseluruhan sebesar 4,21, di mana indikator pemahaman batas waktu pembayaran (X1.5) menempati skor tertinggi sebesar 4,42. Hal ini mengindikasikan bahwa WPOP Pekerjaan Bebas di Kabupaten Purworejo memiliki dasar literasi perpajakan formal yang sangat baik. Sejalan dengan hal tersebut, implementasi Self-Assessment System (X2)dinilai efektif oleh responden dengan rerata capaian 4,25. Kedisiplinan melakukan pelaporan secara mandiri (X2.4) menjadi poin dominan dengan nilai mean 4,29. Pada variabel Sanksi Perpajakan (X3), nilai rata-rata kelompok bertengger di angka 4,27. Responden mempersepsikan sanksi sebagai instrumen yang memiliki kepatuhan hukum yang sesuai dengan regulasi (X3.4 = 4,36), meskipun indikator ketegasan aparat (X3.3) memiliki nilai terendah sebesar 4,09 yang mencerminkan harapan adanya penegakan hukum yang lebih konsisten di lapangan.

Sebaliknya, kontras yang signifikan ditunjukkan pada variabel dependen Tax Evasion (Y). Karena item kuesioner disusun menggunakan pernyataan negatif (reverse-coded), rendahnya nilai rata-rata kumulatif sebesar 1,58 menunjukkan hasil yang sangat positif bagi kepatuhan fiskal. Skor minimum berada di angka 1 (Sangat Tidak Setuju) dan maksimum hanya menyentuh angka 3 (Netral). Mayoritas responden secara tegas menolak tindakan penggelapan pajak, dengan penolakan tertinggi berada pada indikator kesengajaan menunda laporan (Y.5= 1,47) dan manipulasi kelengkapan objek pajak (Y.1= 1,48). Secara umum, sebaran data deskriptif ini mengonfirmasi bahwa tingginya pemahaman, optimalnya sistem pelaporan mandiri, serta ketatnya sanksi berbanding lurus dengan rendahnya intensi perilaku tax evasion pada kelompok pekerja bebas di wilayah Purworejo.

Analisis Regresi Berganda

Pengujian hipotesis dalam penelitian ini menggunakan analisis regresi linier berganda guna mengestimasi arah dan besaran pengaruh variabel Pemahaman Perpajakan (X1), Self Assessment System (X2), dan Sanksi Perpajakan (X3) terhadap Tax Evasion (Y). Ringkasan hasil pengujian regresi, uji kelayakan model (Uji F), uji parsial (Uji t), dan koefisien determinasi disajikan secara komprehensif pada Tabel 5 berikut:

Tabel 5. Ringkasan Uji Regresi

Variabel	**Koefisien Regresi (B)**	**Std. Error**	**t_{hitung}**	**Sig.**
(Konstanta)	-1,209	805	-1,501	137
Pemahaman Perpajakan (X1)	150	71	2,113	37
Self Assessment System (X2)	153	72	2,109	38
Sanksi Perpajakan (X3)	128	63	2,019	46
F-hitung	44,695			0
Adjusted R-Square	570			
N	100			

Berdasarkan Tabel 5, persamaan regresi linier berganda yang terbentuk adalah sebagai berikut:

$$Y = -1209 + 0,150X_1 + 0,153X_2 + 0,128X_3 + \varepsilon \quad (2)$$

Dalam menginterpretasikan persamaan di atas, perlu ditekankan bahwa instrumen variabel dependen Tax Evasion (Y) menggunakan pengukuran reverse-coded (pernyataan negatif), di mana skor tinggi (5) menyatakan "Sangat Tidak Setuju" dan skor rendah (1) menyatakan "Sangat Setuju". Dengan demikian, arah koefisien regresi (B) yang bernilai positif pada seluruh variabel independen secara matematis menunjukkan bahwa peningkatan pada variabel bebas akan meningkatkan skor Y. Peningkatan skor ini merepresentasikan penolakan yang semakin kuat dari wajib pajak terhadap tindakan penyimpangan, yang secara konseptual bermakna menurunnya intensi tax evasion.

Uji Kelayakan Model (Uji F) dan Koefisien Determinasi

Hasil evaluasi kelayakan model (goodness of fit) menunjukkan nilai F-hitung sebesar 44,695 dengan probabilitas signifikansi 0,000. Mengingat nilai signifikansi < α = 0,05 dan F-hitung > F-tabel (2,699), model regresi ini dinyatakan layak secara empiris. Temuan ini mengindikasikan bahwa Pemahaman Perpajakan, Self Assessment System, dan Sanksi Perpajakan secara simultan memberikan pengaruh yang signifikan terhadap Tax Evasion.

Lebih lanjut, kemampuan prediktif model dievaluasi melalui nilai Adjusted R-Square sebesar 0,570. Hal ini bermakna bahwa 57% variasi dari Tax Evasion mampu dijelaskan oleh ketiga variabel independen dalam model penelitian. Adapun sisa variabilitas sebesar 43% dijelaskan oleh determinan lain di luar ruang lingkup model ini. Secara teoretis dan empiris, faktor lain yang berpotensi memengaruhi meliputi tarif pajak (Bajri, 2024; Zahro et al., 2023), persepsi keadilan sistem (Astiawan & Kartika, 2022; Leana & Kholis, 2022), serta orientasi psikologis seperti kecintaan terhadap uang atau love of money (Ustantini et al., 2024; Zahro et al., 2023).

Pengujian Hipotesis Parsial (Uji t)

Pengujian hipotesis secara individual (uji parsial) dilakukan menggunakan Uji t. Pengujian ini didasarkan pada perbandingan antara nilai t-hitung dengan t-tabel (1,664) pada taraf signifikansi 5%. Ringkasan hasil uji parsial dapat dilihat pada tabel 6 berikut:

Tabel 6. Ringkasan hasil uji parsial

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-1.209	.805		-1.501	.137
	Pemahaman Perpajakan	.150	.071	.271	2.113	.037
	Self Assessment System	.153	.072	.282	2.109	.038
	Sanksi Perpajakan	.128	.063	.260	2.019	.046

a. Dependent Variable: Tax Evasion

Keputusan untuk masing-masing hipotesis adalah sebagai berikut:

1. Pengaruh Pemahaman Perpajakan terhadap Tax Evasion (H1)
   Variabel Pemahaman Perpajakan (X1) memiliki nilai t-hitung 2,113 > 1,664 dengan nilai signifikansi 0,037<0,05. Koefisien regresi bernilai positif (0,150) yang menandakan terjadinya peningkatan skor penolakan terhadap penyimpangan pajak. Dengan demikian, secara konseptual pemahaman perpajakan terbukti mampu menekan atau berpengaruh negatif terhadap perilaku penggelapan pajak. Oleh karena itu, H1 diterima. Temuan ini sejalan dengan teori fiskal dan perspektif kognitif yang menyatakan bahwa pemahaman atas peraturan, fungsi, dan manfaat pajak merupakan determinan penting dari kepatuhan sukarela (voluntary compliance) (Prayitno et al.,

2025; Sianturi et al., 2024). Wajib pajak yang memiliki pengetahuan perpajakan yang memadai akan lebih mampu memahami konsekuensi hukum dari tindakan penggelapan pajak, sehingga kecenderungan untuk melakukan tax evasion semakin rendah. Hasil ini konsisten dengan penelitian Putri & Lestari (2023) yang menemukan bahwa pemahaman perpajakan berpengaruh negatif secara signifikan terhadap persepsi keetisan penggelapan pajak. Dalam penelitian lain oleh Kodirun & Juitania (2025) dan Ryketeng et al., (2025), disebutkan bahwa semakin tinggi tingkat pemahaman perpajakn seseorang, maka akan semakin tinggi pula tingkat keengganan untuk melakukan penggelapan pajak. Dalam konteks perpajakan di Indonesia, di mana literasi pajak masyarakat masih relatif terbatas, peningkatan edukasi perpajakan melalui penyuluhan dari Jirektorat Jenderal Pajak (DJP) maupun pelatihan mengenai pengetahuan dan kesadaran pajak menjadi intervensi kebijakan yang sangat relevan untuk menekan perilaku penggelapan pajak (Aulia et al., 2025; Wati et al., 2022; Wi et al., 2023).

2. Pengaruh Self Assessment System terhadap Tax Evasion (H2)
   Variabel Self Assessment System (X2) mencatatkan nilai t-hitung 2,109>1,664 dengan tingkat signifikansi 0,038<0,05. Nilai koefisien regresi positif (0,153) menunjukkan bahwa sistem pelaporan mandiri yang berjalan efektif akan meningkatkan skor penolakan penyimpangan pajak (menurunkan tax evasion). Oleh karena itu, H2 diterima. Hasil ini memberikan dukungan empiris terhadap perspektif bahwa Self-Assessment System, apabila diimplementasikan secara optimal, dapat berfungsi sebagai mekanisme kontrol perilaku perpajakan yang efektif. Sistem ini menempatkan wajib pajak sebagai agen aktif yang bertanggung jawab penuh atas penghitungan, pelaporan, dan pembayaran pajaknya sendiri, sehingga mendorong internalisasi tanggung jawab fiskal (Alfandi & Wafiroh, 2025; Belananda, 2024; Indriana & Fauzan, 2025). Koefisien standardized Beta (0,282) yang sedikit lebih besar dibandingkan Pemahaman Perpajakan (0,271) dan Sanksi Perpajakan (0,260) mengindikasikan bahwa Self-Assessment System memiliki pengaruh relatif terbesar dalam model ini. Temuan ini memperkuat argumen bahwa reformasi administrasi perpajakan berbasis kepercayaan (trust-based tax administration) perlu disertai dengan penguatan kapasitas dan integritas sistem mandiri agar tidak menjadi celah untuk manipulasi fiscal (Orioha et al., 2026; Svetlozarova Nikolova, 2023; Thao, 2023).
3. Pengaruh Sanksi Perpajakan terhadap Tax Evasion (H3). Variabel Sanksi Perpajakan (X3) menunjukkan nilai t-hitung 2,019>1,664 dengan signifikansi sebesar 0,046<0,05. Koefisien positif (0,128) membuktikan bahwa persepsi sanksi yang tegas secara empiris selaras dengan Deterrence Theory, di mana hal tersebut akan mendorong penolakan wajib pajak terhadap tindakan penghindaran ilegal, sehingga secara konseptual menurunkan tingkat tax evasion. Oleh karena itu, H3 diterima. Secara teoretis, hasil ini selaras dengan Deterrence Theory (Matshona et al., 2024; Miranda et al., 2023) yang menyatakan bahwa keputusan individu untuk mematuhi atau menghindari kewajiban pajak merupakan fungsi dari probabilitas deteksi dan besarnya sanksi yang diterapkan. Ditambahkan dari hasil penelitian oleh Zahro (2023) dan Belananda (2024) yang menyatakan bahwa ketika wajib pajak mempersepsikan bahwa sanksi perpajakan bersifat tegas, konsisten, dan proporsional, maka kalkulasi risiko-manfaat dari tindakan

penggelapan pajak menjadi tidak menguntungkan, sehingga mendorong kepatuhan. Namun demikian, meskipun sanksi terbukti signifikan secara statistis, nilai koefisien Beta-nya (0,260) merupakan yang terkecil di antara ketiga prediktor. Hal ini mengisyaratkan bahwa pendekatan penegakan hukum semata tidak cukup (Herlita et al., 2025); pendekatan yang lebih komprehensif yang mengintegrasikan peningkatan pemahaman perpajakan dan penyempurnaan sistem administrasi akan menghasilkan dampak yang lebih optimal dalam menekan tax evasion(Fanani & Selfiani, 2025; Turaev, 2023).

4. Pemahaman perpajakan, self assessment system, dan sanksi perpajakan berpengaruh positif terhadap tax evasion. Hasil uji F menunjukkan nilai F-hitung sebesar 44,695 dengan probabilitas signifikansi 0,000. Oleh karena nilai signifikansi jauh lebih kecil dari taraf batas $\alpha=0{,}05$ dan F-hitung > F-tabel (2,699), maka hal ini membuktikan bahwa variabel Pemahaman Perpajakan, Self Assessment System, dan Sanksi Perpajakan secara simultan memberikan pengaruh positif yang signifikan terhadap tingkat Tax Evasion. Oleh karena itu, H4 diterima.

Secara integratif, ketiga variabel tersebut merepresentasikan tiga dimensi kunci dalam sistem perpajakan modern: dimensi kognitif (pemahaman), dimensi administratif (sistem pelaporan mandiri), dan dimensi hukum-punitif (sanksi). Ketiganya saling melengkapi dalam membentuk perilaku kepatuhan wajib pajak. Pemahaman perpajakan membangun kesadaran dan rasionalitas fiskal; Self-Assessment System menyediakan mekanisme struktural yang mendorong tanggung jawab mandiri; sedangkan sanksi perpajakan memberikan deterrensi eksternal yang memperkuat norma kepatuhan. Temuan ini mendukung pandangan bahwa intervensi kebijakan perpajakan yang efektif perlu bersifat multidimensional, tidak hanya mengandalkan satu instrumen tunggal (Jankowska-Ambroziak et al., 2023).

Nilai Adjusted R2 sebesar 0,570 mengonfirmasi bahwa lebih dari separuh variasi dalam Tax Evasion dapat dijelaskan secara bersama-sama oleh ketiga prediktor ini. Temuan ini memiliki implikasi kebijakan yang penting: strategi pencegahan tax evasion yang paling efektif adalah yang bersifat holistik, menggabungkan edukasi pajak yang berkelanjutan (Djatnicka et al., 2025; Turaev, 2023; Wi et al., 2023), pembenahan sistem administrasi pelaporan mandiri (Sriarwi et al., 2025), dan penegakan sanksi yang konsisten dan transparan (Ali & Shuid, 2025).

KESIMPULAN DAN SARAN

Simpulan

Berdasarkan hasil analisis data dan pengujian hipotesis, penelitian ini menyimpulkan bahwa pemahaman perpajakan, self assessment system, dan sanksi perpajakan, baik secara parsial maupun simultan, terbukti secara empiris mampu menekan intensi tax evasion pada Wajib Pajak Orang Pribadi (WPOP) Pekerjaan Bebas di Kabupaten Purworejo. Wajib pajak yang memiliki literasi prosedural yang baik cenderung memiliki sikap rasional yang menolak adanya manipulasi data pajak. Selain itu, kedisiplinan dalam implementasi pelaporan mandiri yang dipadukan dengan persepsi terhadap sanksi administratif yang tegas dan mengikat, terbukti beroperasi sebagai instrumen pencegah (deterrent) yang efektif untuk menutup celah penghindaran pajak ilegal. Temuan ini secara utuh mengonfirmasi dan memperkuat relevansi Theory of Planned Behavior serta Deterrence Theory dalam memodelkan perilaku kepatuhan wajib pajak pada sektor pekerja non-formal.

Implikasi Penelitian

Secara teoretis, penelitian ini memperkaya literatur akuntansi keperilakuan (behavioral accounting) dengan membuktikan bahwa pendekatan psikologis (pemahaman dan kemandirian sistem) yang bersinergi dengan pendekatan penegakan hukum (sanksi) secara kolektif menciptakan lingkungan kepatuhan yang kondusif. Secara praktis, temuan ini memberikan masukan strategis bagi otoritas pajak, khususnya Pos Pelayanan Pajak Kabupaten Purworejo. Otoritas pajak disarankan untuk terus proaktif melakukan sosialisasi literasi pelaporan e-Filing dan menegakkan transparansi denda guna merawat efek jera (deterrence effect), mengingat tingginya kerentanan kepatuhan pada segmen pekerja bebas.

Keterbatasan dan Saran

Penelitian ini tidak terlepas dari beberapa keterbatasan, di antaranya adalah nilai koefisien determinasi yang menunjukkan masih adanya 43% varians tax evasion yang dipengaruhi oleh determinan lain di luar model pengujian. Selain itu, pengumpulan data berbasis kuesioner (self-reported data) memiliki kerentanan terhadap bias persepsi normatif dari responden. Oleh karena itu, penelitian selanjutnya disarankan untuk memperluas model dengan mengintegrasikan variabel keperilakuan dan sistemik lainnya, seperti persepsi keadilan sistem pajak, tarif pajak, kualitas pelayanan fiskus, atau orientasi love of money. Ekspansi cakupan demografis ke tingkat lintas wilayah (provinsi) serta penggunaan pendekatan metode campuran (mixed-methods) melalui wawancara mendalam juga sangat direkomendasikan guna memvalidasi temuan survei dan meningkatkan daya generalisasi riset di masa mendatang.

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BUOYANCY AND ELASTICITY OF VAT IN THE NEPALESE ECONOMY

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Abstract: *This study examines the buoyancy and elasticity of VAT in the Nepalese economy by shifting the conventional responsiveness framework toward an endogenous-growth perspective that evaluates how VAT mobilization relates to aggregate real GDP while controlling for exchange rate, remittance, market capitalization, money supply, and government spending. Using annual time-series data for fiscal years 2003/04–2022/23 compiled from Government of Nepal Economic Surveys, all variables were converted to constant prices using the GDP deflator (base year 2013/14), transformed into log-linear form, and assessed for stationarity and classical assumptions. The preferred model exhibited strong explanatory power (adjusted $R^2 \approx 0.814$), acceptable serial-correlation and heteroskedasticity properties, no structural break, and no multicollinearity (VIF < 10), supporting long- and short-run inference. VAT showed a positive and statistically meaningful association with real GDP: a 1% rise in VAT corresponded to a 0.427% increase in real GDP in the short run and 0.46% in the long run, indicating modest but sustained marginal productivity of VAT. Descriptive evidence further showed Nepal's heavy reliance on indirect taxes (average share 58.87% of total revenue) and a fluctuating VAT share; after VAT adoption (1997/98–2016/17) VAT rose only sixfold and averaged 27.58% of total revenue, only 0.93 percentage points higher than the replaced taxes pre-VAT, implying implementation gaps. Overall, results suggest VAT supports growth but exhibits low long-run buoyancy/elasticity, underscoring the need for targeted reforms to strengthen VAT administration, compliance, and revenue efficiency.*

Keywords*: Buoyancy, VAT administration, GDP, VAT*

INTRODUCTION

The Value Added Tax (VAT) is the solitary most significant development in the tax system during the last fifty years in terms of its influence on government revenue, its rate, its base, and its geographical coverage. As such, VAT has become a standard element of the fiscal system in advanced as well as emerging countries throughout the world (Luitel, 2005). Resistance and flexibility are two important measures that are frequently used to address these apprehensions. The elasticity coefficient refers to the tax system that is capable of producing determined revenue from variations only in economic environments, keeping the influential set-up, tax rates, and bases unbroken, while the tax buoyancy processes the revenue effect of both variations in economic circumstances and exogenous policy changes including secretarial and policy reforms. A rising VAT-to-GDP ratio will help condense both financial deficit and public debt level. The essential for higher VAT revenue deployment for emerging countries is substantial. The essential to spend a remarkable amount of public resources to meet high growth ambitions of people without compromising macroeconomic balance. When a country has flexibility and springiness of VAT greater than that of the union, it has a revenue evolution larger than the growth rate of nationwide income (GDP). Buoyant and elastic tax systems raise the VAT-to-GDP ratio, help keep the fiscal and debt situation amalgamated, and reduce foreign dependence for development financing. The growth rate of national output raises revenue, but the degree to which it raises revenue is also determined by the level of VAT escaping and VAT elusion dominant in the country. The necessity of VAT exemptions also reduces VAT revenue collection.

This indicates that VAT is struggling to be a commanding method to promote economic growth (GDP) in the country. Wearing on transitional transactions, business tax hints at the loss of creation productivity. Therefore, in preparation, VAT is used to replace the business tax and the single-stage sales tax. However, some scholars trust that VAT, in uncomplicatedness and universality, has potential advantages compared with turnover tax, but the comparative advantage is not dramatically remarkable in economic efficiency in the thought of an ordinary person. In terms of VAT, the studies initially focused on assessing the impact of this tax on international trade (Feldstein and Krugman, 1989) or on identifying the determinants of tax revenue (Bogetic and Hassan, 1993). Later, attention was directed to studying the effectiveness of this type of tax (Bird and Gendron, 2006). More recently, the relationship between VAT revenue and total tax revenue has been studied, but in terms of the impact that the tax system can have on economic growth (Okoli and Afolayan, 2015). The problem was formulated exclusively in terms of economic impact and less in terms of fiscal sustainability. The European Commission (2015) tended to be more interested in enhancing the fiscal system. Issues such as exchange rate, remittance, market capitalization, money supply, and government spending disturb the value-added tax revenue collection. The theoretical logic behind this argument is that intensification in exchange rate, market capitalization, money supply, and reduction in government spending and remittance depress the purchasing power of the individuals in the nation. When purchasing power falls, it leads to a reduction in consumption, while VAT is a consumption-based tax, so it also declines.

LITERATURE REVIEW

Traditionally, tax buoyancy and elasticity have measured the responsiveness of tax revenue (dependent) to changes in GDP (independent). However, the model specified—where GDP is the dependent variable and VAT revenue is the independent variable, controlled by exchange rates, money supply, market capitalization, and government spending—shifts the analytical focus to an endogenous Growth Model. In this framework, the research objective is to determine how effectively VAT mobilization drives economic growth through fiscal channels, rather than merely measuring the tax system's automatic responsiveness to growth gear and events, which are available for assessing the resistance and Flexibility of VAT and its influence on the economy. VAT is of German and American paternity. Shortly after the First World War, the basic principles were developed in both nations (Adams, 1921; Siemens, 1921). In the 1950s, there was a revival of interest in VAT in Western Europe and America (Laure, 1952; Huiscamp, 1954; Schmblders, 1956; Shoup, 1955). Studenski (1940) constructed a general ethical philosophical foundation for the use of VAT and developed and related to VAT a "cost of services variant" of the benefit principle of taxation justice. In the same year, Senator O'Mahoney introduced the value-added concept in proposed federal legislation (O'Mahoney, 1940).

Recent studies emphasize that VAT is the single largest source of government revenue in Nepal and is a critical driver of macroeconomic stability. Impact on Aggregate GDP: Research by Sah (2023) titled "VAT elasticity on Nepalese economy without agriculture" specifically examines the impact of VAT on aggregate GDP levels. The study establishes that VAT collection has significant elasticity with respect to economic output, suggesting that formal sector growth (captured by VAT) is a potent indicator of overall economic health. Growth vs. Accumulation Trade-off:** A study assessing tax revenue in Nepal found that while VAT revenue and GDP share a positive relationship, high VAT collection can have a negative effect on private capital accumulation growth. This suggests that while VAT funds the state, the consumption-tax burden may constrain private investment if not reinvested efficiently into productivity-enhancing infrastructure

In Nepal, VAT was implemented in 1997, two years after the VAT Act was approved by the assembly in 1995. It substituted the erstwhile sales tax, contract tax, service tax, and entertainment tax. Therefore, VAT is inclusive of all four taxes it replaced. After the implementation of VAT, it slightly changed the prices of goods and services. Under the VAT system, the tax is based on the principle that each producer or distributor adds value, in some way, to the materials they have purchased, and this added value is taxed at each stage of the production and distribution chain. In the VAT system, producers, distributors, and people providing services charge VAT for the products or the services sold or provided and the claim a refund of VAT on the goods or services purchased to make these sales. If the tax on sale is less than the tax on purchase, the person claims a refund for the difference. Thus, VAT has been perceived as a vital device for securing macroeconomic solidity and growth by placing domestic revenue mobilization comparatively by sounder base (Adhikari, 2003). To implement the VAT universal, the fiscal matters Department of the IMF has provided a considerable amount of mechanical support to various countries.

VAT is the vital content of the contemporary tax management system as it shortens the tax administration and expands tax compliance. However, VAT also has some possible difficulties and is not favorable to competence. When the transaction chain breaks, VAT leads to a loss of production efficiency (Desai-Hines, 2005). In addition, because the tax system is not perfect and the statutory tax rebate is too high, VAT does not help exports and trade; hence, it reduces exports and domestic output. Meanwhile, VAT has a negative impact on the informal sector of the economy (Piggott and Whalley, 2001; Emran and Stiglitz, 2005; Keen, 2008). Meanwhile, it is not clear whether the presentation of value-added tax is favorable to the development of competence.

Modern investigation emphases on examining the association between VAT revenues and economic growth, both using a regression model in which the instructive variables are the tax revenues of each type of tax, and GDP is the variable explained (Kalaš et al., 2018), or applying VAR models (Mutaşcu and Dănulețiu, 2011) or by checking the Granger causality (Al-Abbadi and Abdel Khaliq, 2017). Similarly, Romer and Romer (2010) focused on the impact of fiscal policy changes on economic activity. Unrestricted VAR and structural VAR models were also applied to assess the macroeconomic effects of fiscal policy (Afonso and Sousa, 2011). In fact, this approach constitutes a return to the way of looking at taxation from an economic point of view. Economists' concerns were almost exclusively related to the influence of public spending on economic growth, rather than the influence of taxation, the main growth model being analyzed comprehensively by Barro. & Sala-i-Martin, X.I. (1995). When tax revenues are considered, the meaning of the analysis is from taxation to economic activity (Leibfritz et al., 1997; Perotti, 2004).

METHODOLOGY

To observe the elasticity and buoyancy among value-added tax (VAT) and financial development proxied by GDP at the comprehensive level, the study employs descriptive and explanatory investigation plans in view of VAT as a self-determining variable and GDP as the needy variable at the aggregate level, in addition to remittance, exchange rate, market capitalization, money supply (M1 M2), and government spending as overriding variables. In so doing, it is theorized that there is significant positive impact of VAT on GDP. Likewise, it is also theorized that the overriding variables government spending and money supply have optimistic association, whereas exchange rate and market capitalization have undesirable. In the progression of using and testing the association between remittance and GDP with other overriding variables, error correction model (ECM) is employ. Numerous additional examinations such as unit root test, DF and ADF, autocorrelation, fractional correlation, correlogram, test, Durbin Watson, HDW, Jarque-bera normality test, serial correlation test, heteroscedasticity, Glejser test, specification test, test of Exogeneity, structural break test, Multicollinearity test Ramsey test and Chow-test have correspondingly been employed to validate the model. The measurable data employed in this study have been collected from the Economic survey published of Government of Nepal.

The data facts for these variables included in annual observation from fiscal year 2003/04 to fiscal year 2022/23. The values of all the variables are converted into real price by GDP deflator. Mainly, real GDP without agriculture, real remittance, real money supply, real market capitalization, and real exchange rate are calculated as nominal exchange rate (that is, NPR to USD) multiplied by the GDP deflator (i.e., base year 2013/14=100) over 20 years period. The simple linear model was converted into a log linear model. For the specification model of the cointegrated regression model with time-series data, the variables are employed in the model. of the variables were employed for the study period of 20 years from 2003/04 to 2022/23. Econometrically, the modeling of such behavior requires a stationary data process, which is absent in many economic variables (Wood, 1995).

Model specification

To measure a cointegrated regression model with time series data, the variables are laboring for the study period of 20 years from 2003/04 to 2022/23. Econometrically, modeling such behavior requires stationary data, which are preoccupied with economic variables (Wood, 1995). The stationary data process designates the constant mean and variance of each data series of the variables involved in the model. Lawful estimation is not possible when a set of stationary variables is cointegrated, and the set of views remains worthless. This means that the approximation based on non-stationary data series does not help to admit or discard the estimation. The cointegrated regression shows the occurrence of a long-run balance association. Theoretically, one should be cautious in the custom of time-series data, whether stationary or non-stationary, for conditions of macro data such as GDP. Modeling economic performance requires attention. As GDP is significant for the economic planning of the country, this necessitates information on the status of the economy and its comportment.

The model used in this revision was the cointegration approach. Various fictions are available regarding this approach. The important contributions are made by Engle and Granger (1987, 1991) and Dickey et al. (1991), (Wood, 1995), and (Perman, 1989, 1991, 1993), who contended for the need of stationary data series to employ cointegration theory. As many economic variables do not possess the characteristics of stationarity, it is essential to keep in mind the type of data series used in the model. Lawful approximation and extrapolation are not imaginable when a set of non-stationary variables is cointegrated. After the approximation of three different equations to find suitable variables for the approximation, an Error Correction Model (ECM) is employed for VAT efficiency procedures with the use of lagged dependent variable also simplifies to obtain short and long-term consequence of value added tax (VAT). The first differences data is used for ECM. The cointegration of a set of variables delivers adequate pounded for stipulating a corresponding error correction or dynamic equation for these variables and is well-matched with long-run steadiness behavior.

Model specification: GDP as dependent, VAT revenue and other intervening variables

So as to scrutinize the influence of VAT revenue on national economic development provided by GDP as dependent variable, allowing for VAT as independent variable and exchange rate, remittance, market capitalization, money supply (M1, M2), and government spending, as intervening variables. The relationships between the variables are specified as below:

$$GDP_{ct} = f\ (VAT_{ct},\ Exr_{ct},\ R_{ct},\ MC_{tc},\ MS_{ct},\ GS_{ct})$$

The relationship and impact of VAT on GDP has specified as:

$$\ln GDP_{ct} = \ = \beta_0 + \beta_1 \ln VAT_{ct} + \beta_2 \ln EXR_{ct} + \beta_3 \ln R_{ct} + \beta_4 \ln MC_{ct} + \beta_5 \ln MS_{ct} + \beta_6 \ln GS_{ct} + \ldots \ \ldots + e_i \ldots (1$$

$$\ln GDP_{ct} = \beta_0 + \beta_1 \ln VAT_{ct} + \beta_2 \ln EXR_{ct} + \beta_3 \ln R_{ct} + \beta_4 \ln MC_{ct} + \beta_5 \ln MS_{ct} + \ldots \ldots \ldots + e_i \ .(2)$$

$$\ln GDP_{ct} = \beta_0 + \beta_1 \ln VAT_{ct} + \beta_2 \ln EXR_{ct} + \beta_3 \ln R_{ct} + \beta_4 \ln MC_{ct} + \beta_5 \ln GS_{ct} + \ldots \ldots \ldots + e_i \ (3)$$

where:

lnGDP_ct = Characterizes Gross Domestic Products at constant price at time't' in logarithm.

lnVAT_ci = Characterizes Value Added tax revenue in constant price at time't' in logarithm.

lnEXR_ct = Characterizes Exchange Rate at constant price at time't' in logarithm.

lnR_ct = Characterizes Remittance at constant price at time't' in logarithm.

lnMC_ct = Characterizes Market capitalization at constant price at time't' in logarithm.

lnMS_ct = Money Supply at constant price at time't' in logarithm.

lnGS_ct = Government spending at constant price at time, 't' in logarithm.

H_{01}: VAT has significant impact on GDP on aggregate level

Unit root test

A unit root test verifies whether a time-series variable is nonstationary using an autoregressive model. A well-known test that is valid in large samples is the augmented Dickey–Fuller (ADF) test. Optimal finite sample tests for a unit root in autoregressive models are developed. Dickey and Fuller (1979) developed a procedure to test whether a variable has a unit root or, equivalently, whether the variable follows a random walk. Hamilton (1994) described four different cases to which the augmented Dickey–Fuller test could be applied. In the process of checking whether the variables have a unit root. If the absolute test statistics are more than the critical value, then the null hypothesis that the series is non-stationary cannot be accepted. That is the guidelines. However, if the absolute test statistics are less than the critical value, the null hypothesis can be rejected and the alternative hypothesis will be accepted. A unit root test verifies whether a time series variable is non-stationary using an autoregressive model. A well-known test that is valid in large samples is the augmented Dickey–Fuller test

H_1: The variable log linear at constant price has stationarity or no unit root.

Table:1

Dickey fuller, Augmented Dickey fuller and unit root test

Variables	Test	Dickey-fuller	Augmented Dickey-fuller	p-value	Coefficient At lag	Unit root	
						t-stat ( )	p-value
$lnGDP_{ct}$	At level	-1.9662 (-3.029)	-3.0299 (-1.4044)	0.6671	-0.0471	1.238 (812.40)	0.000
	At first difference	-1.9628 (-4.125)	-3.0521 (-3.9937)	0.0081	-1.4106	1.6245 (309.399)	0.000
$lnVAT_{ct}$	At level	-1.9662 (0.3950)	-3.0299 (0.2921)	0.9712	0.0124	1.3581 (196.271)	0.000
	At first difference	-1.9614 (-4.6728)	-3.0403 (-4.8812)	0.0013	-1.1717	2.1093 (62.918)	0.000
$lnMC_{ct}$	At level	-1.9601 (-0.5294)	-3.0299 (-0.9999)	0.7312	0.0746	1.2805 (144.245)	0.000
	At first difference	-1.9644 (-3.7019)	-3.0655 (-3.6319)	0.0174	-1.3269	1.7718 (51.8051)	0.000
lnR_{ct}	At level	-1.9601 (-1.4005)	-3.0299 (-3.1243)	0.0417	-0.01874	1.2948 (159.197)	0.000
	At first difference	-1.9614 (-3.5551)	-3.0403 (-3.4501)	0.0226	-0.8662	1.8292 (56.0503)	0.000
$lnEXR_{ct}$	At level	-1.9601 (-0.5063)	-0.30299 (-0.4639)	0.8783	-0.0614	2.1073 (113.8986)	0.000
	At first difference	-1.9614 (-5.4741)	-3.0403 (-5.3507)	0.0005	-1.2857	-12.910 (-6.2871)	0.000
$lnMS_{ct}$	At level	-1.9601 (-1.5863)	-3.0299 (-1.7535)	0.3903	-0.2887	1.2420 (375.850)	0.000
	At first difference	-1.9614 (-6.8129)	-3.0403 (-6.6097)	0.000	-1.4639	1.6378 (142.2958)	0.000

It is obvious from the table that the variable $lnGDP_{ct}$ has the p-value that is 0.6671 > 0.05 so it cannot reject the null hypothesis, meaning that, the variable $lnGDP_{ct}$ at level has a unit root. The test statistics guidelines indicates that the test statistics is more than critical value at 5% it cannot reject the null hypothesis but the test statistics -0.4044 and critical value at 1% and 5% and 10% is less than test statistics. So, it cannot reject the null hypothesis, meaning that, the variables has a unit root the P-value >0.05. so it cannot reject the null hypothesis , meaning that the all the variables have a unit root at level. In addition, the coefficient at lag one is also negative i.e. -0.047117of all the variables. So the model is viable. After the first differences level of probability or the p-value that is 0.0081<0.05. so, the null hypothesis has rejected, meaning that the variables has no unit root or stationary after the first difference, including all the variables in the model.

Correlogram test various time lag the probability value or p-value < 0.05 indicates the null hypothesis cannot rejected, it means that the variables have auto correlation at level including variables $\ln GDP_{ct}$, $\ln VAT_{ct}$, $\ln Remit\ T_{ct}$, $\ln EXR_{ct}$, $\ln R_{ct}$, $\ln MC_{ct}$, and $\ln MS_{ct}$. At the first difference level of the correlogram, an image of correlation statistics is ups and downs and highs and lows and ups and downs. This means there is no autocorrelation. Or p-value > 0.05 indicates the null hypothesis can be rejected. Meaning that the variables have no auto correlation at first difference level.

Table No. 2

Correlogram at first difference level of all the variables included in the model

<table>
<tr><th>Auto correlation</th><th>Partial correlation</th><th></th><th>AC</th><th>PAC</th><th>Q</th><th>Probability</th></tr>
<tr><td>. | . |</td><td>. | . |</td><td>1</td><td>-0.016</td><td>-0.016</td><td>0.0060</td><td>0.938</td></tr>
<tr><td>**| . |</td><td>**| . |</td><td>2</td><td>-0.369</td><td>-0.369</td><td>3.2006</td><td>0.202</td></tr>
<tr><td>.* *| . |</td><td>. ***| . |</td><td>3</td><td>-0.093</td><td>-0.124</td><td>3.4165</td><td>0.332</td></tr>
<tr><td>. |**. |</td><td>. |* . |</td><td>4</td><td>0.283</td><td>0.162</td><td>5.5528</td><td>0.235</td></tr>
<tr><td>. |** . |</td><td>. |* . |</td><td>5</td><td>0.194</td><td>0.169</td><td>6.6298</td><td>0.250</td></tr>
<tr><td>.***| . |</td><td>. **| . |</td><td>6</td><td>-0.293</td><td>-0.169</td><td>9.2696</td><td>0.159</td></tr>
<tr><td>.**| . |</td><td>.***| . |</td><td>7</td><td>-0.324</td><td>-0.257</td><td>12.770</td><td>0.078</td></tr>
<tr><td>. |***. |</td><td>. |**. |</td><td>8</td><td>0.351</td><td>0.235</td><td>17.230</td><td>0.028</td></tr>
<tr><td>. |** |</td><td>. *| . |</td><td>9</td><td>0.151</td><td>-0.077</td><td>18.141</td><td>0.034</td></tr>
<tr><td>. **| . |</td><td>. |** . |</td><td>10</td><td>-0.094</td><td>0.087</td><td>18.530</td><td>0.047</td></tr>
<tr><td>.**| . |</td><td>. | . |</td><td>11</td><td>-0.214</td><td>-0.017</td><td>20.810</td><td>0.035</td></tr>
<tr><td>. | * . |</td><td>. *| .* |</td><td>12</td><td>-0.053</td><td>-0.163</td><td>20.972</td><td>0.051</td></tr>
<tr><td>. |* . |</td><td>. | . * |</td><td>13</td><td>0.198</td><td>-0.062</td><td>23.571</td><td>0.035</td></tr>
<tr><td>. *| *. * |</td><td>. *| . * |</td><td>14</td><td>-0.099</td><td>-0.175</td><td>24.351</td><td>0.042</td></tr>
<tr><td>. *| . |</td><td>. * | . |*</td><td>15</td><td>-0.188</td><td>0.023</td><td>27.860</td><td>0.022</td></tr>
<tr><td>. | * . |</td><td>.* | * . |</td><td>16</td><td>0.052</td><td>-0.010</td><td>28.215</td><td>0.030</td></tr>
<tr><td>. | .* |</td><td>. *| . |</td><td>17</td><td>0.017</td><td>-0.105</td><td>28.273</td><td>0.042</td></tr>
<tr><td>. | *. *|</td><td>. *| . |</td><td>18</td><td>-0.003</td><td>-0.109</td><td>28.276</td><td>0.058</td></tr>
</table>

Null hypothesis: the variables log linear at real price has auto

The table shows the occurrence of autocorrelation. This randomness is ascertained by calculating auto correlation for data values at varying time lag.

Table-3

Autocorrelation table

Variables	At level			At first difference		
	AC	Q-Statistic	Pro.	AC	Q-Statistic	Pro.
$\ln GDP_{ct}$	0.845	16.521	0.000<0.05	-0.016	0.0060	0.938 > 0.05
$\ln GDPWA_{ct}$	0.853	16.836	0.000<0.05	-0.138	0.4206	0.517 > 0.05
$\ln GDPP_{ct}$	0.792	14.515	0.000<0.05	-0.029	0.0190	0.890 > 0.05
$\ln GDPPWA_{ct}$	0.825	15.775	0.000<0.05	-0.521	6.0150	0.096 > 0.05
$\ln GDPT_{ct}$	0.751	13.057	0.000<0.05	-0.199	0.8788	0.349 > 0.05
$\ln GDPS_{ct}$	0.849	16.679	0.000<0.05	-0.135	0.4017	0.526 > 0.05
$\ln VAT_{ct}$	0.853	16.852	0.000<0.05	-0.163	0.5870	0.444 > 0.05
$\ln PVAT_{ct}$	0.853	16.833	0.000<0.05	-0.404	3.6114	0.057 > 0.05
$\ln TVAT_{ct}$	0.852	16.527	0.000<0.05	-0.288	1.8443	0.174 > 0.05
$\ln SVAT_{ct}$	0.814	15.346	0.000<0.05	0.050	0.0556	0.814 > 0.05
$\ln MS_{ct}$	0.638	9.4398	0.000<0.05	-0.464	4.7701	0.090 > 0.05
$\ln MC_{ct}$	0.811	15.245	0.000<0.05	0.211	0.9879	0.320 > 0.05
$\ln GSP_{ct}$	0.842	16.414	0.000<0.05	-0.065	0.0945	0.759 > 0.05
$\ln R_{ct}$	0.756	13.248	0.000<0.05	0.1289	0.3611	0.548 > 0.05
$\ln EXR_{ct}$	0.748	12.954	0.000<0.05	-0283	1.7796	0.182 > 0.05

Year	Before VAT revenue Rs.	Total Revenue Rs.	Before VAT % of TR	Year	After VAT revenue Rs.	Total Revenue Rs.	After VAT % of TR
1977/78	6689.36	33659.57	19.87	1997/98	27255.34	105132.14	25.92
1981/82	10455.22	39992.54	26.14	2001/02	33942.84	133489.11	25.43
1986/87	12569.64	53349.11	23.56	2006/07	54961.24	184734.83	29.75
1991/92	17750.77	69295.90	25.62	2011/12	88963.25	306502.07	29.02
1996/97	29130.93	104376.29	27.91	2016/17	146665.37	536722.47	27.32
Avg.	15418.38	59491.26	**26.66%**	**Avg.**	**68108.30**	**245358.75**	**27.58%**
Average differences between after VAT and before VAT= 27.58-26.66 i.e. 0.93%							

Table -3 demonstrates the p-value > 0.05 indicating the rejection of null hypothesis Table-3 shows the p-value > 0.05 indicating the rejection null hypothesis implying that the variables has auto correlation at level. After the first difference implying that there is no auto correlation.

RESULT AND DISCUSSION

A Short overview of revenue mobilization in Nepal

In the total tax revenue collection, the portion of direct tax is comparatively less than the indirect tax. Total tax revenue collection represents the tax revenue collected from direct tax, indirect tax and non-tax revenue. Indirect tax includes excise duties, custom duties and VAT collection. The size of total revenue from direct tax, indirect tax including excise duty customs duty and VAT over 20 years from 1997/98 to 2016/17 in the interval of 5 years as given in the Table: 4.1_a and 4.1_b respectively.

Table 4.1_a

Share of Various tax revenue in total revenue

Years	Direct Tax%	Indirect tax%	Non- tax %
1997/98	18.79	59.97	21.25
2001/02	19.90	58.07	22.03
2006/07	21.64	59.45	18.91
2011/12	27.37	59.26	13.36
2016/17	31.32	58.55	10.13
2021/22	32.19	56.45	11.36
Average	**23.25%**	**58.87%**	**17.86%**

Table 4.1_b

Share of indirect tax revenue in total tax revenue

Years	Custom duty %	Excise duty %	VAT %
1997/98	25.81	6.33	25.92
2001/02	25.09	7.55	25.43
2006/07	19.05	10.65	29.75
2011/12	17.76	12.28	29.02
2016/17	18.359	12.88	27.32
2021/22	18.214	13.34	25.90
Average	**21.17%**	**10.11%**	**27.37%**

Source: Economic survey and Budget speeches of various years (Annex: 1)

Table 4.1_a shows the percentage of different sources of revenue on total revenue collected by the government during the period of 25 years, 1997/98 and 2021/22, at intervals of 5 years. The percentage average revenue from different sources such as direct tax, indirect tax and nontax revenue has been 23.25%, 58.87% and 17.86% respectively over the study period. Similarly, Table 4.1_b reveals the percentage of customs duty, excise duty, and VAT on total indirect tax during 1997/98 to 2021/22 at intervals of five years over period. Over the years, revenue from customs duty recorded a decreasing trend, while excise duty registered a steadily increasing trend. On the contrary, VAT remained fluctuating around the average over the period. Despite a higher average share of indirect tax in the total revenue around 58.87% throughout the study period. Increasing contribution of indirect tax indicates the effects of modernization of tax system in the Nepalese economy over the period. However, fluctuating trend of VAT around the average indicates that there is a need for the effective implementation of VAT.

VAT revenue before and after VAT policy enforcement

VAT replaced sales tax, contract tax, hotel tax and entertainment tax since 17 November 1997(1Marga 2054). The VAT revenue in relation to total revenue before application and after the introduction of VAT has been analyzed. The size of VAT revenue before the VAT application from 1977/78 to 1996/97 in the interval of every five years, and after the VAT application from 1997/98 to 2016/17 in the same interval has been presented in Table 4.2_a and Table 4.2_b respectively.

Table $5._a$

Before VAT policy VAT revenue (Rs. million real price)

Year	Before VAT revenue Rs.	Total Revenue Rs.	Before VAT % of TR
1977/78	6689.36	33659.57	19.87
1981/82	10455.22	39992.54	26.14
1986/87	12569.64	53349.11	23.56
1991/92	17750.77	69295.90	25.62
1996/97	29130.93	104376.29	27.91
Avg.	15418.38	59491.26	**26.66%**

Table $5._b$

After VAT policy VAT revenue (Rs. million real price)

Year	After VAT revenue Rs.	Total Revenue Rs.	After VAT % of TR
1997/98	27255.34	105132.14	25.92
2001/02	33942.84	133489.11	25.43
2006/07	54961.24	184734.83	29.75
2011/12	88963.25	306502.07	29.02
2016/17	146665.37	536722.47	27.32
Avg.	**68108.30**	**245358.75**	**27.58%**

Average differences between after VAT and before VAT= 27.58-26.66, that is, 0.93%

Source: IRD annual report and Economic survey of various years (Annex-2)

Tables 4.2a and 4.2b show the size of VAT revenue before the introduction of VAT in 1977/78 at real price was NPRs 33659.57 million, which was 19.87% of total tax revenue, while that increased to NPRs. 104376.29 million in 1996/97 showing 27.91% of total revenue. Thus it increased by 26.96 times over the period of 20 years before introduction of VAT. However, after the introduction of VAT, VAT revenue was collected NPRs. 105132.14 at real price (25.92% of total revenue) in 1997/98 and NPRs. 536722.47million at real price (27.32% of total revenue) in 2016/17. During the period of 20 years of VAT application VAT increased only 6 fold.

The average percentage of VAT equivalent was 26.66% of total revenue, whereas the average percentage of VAT has been 27.58% of total revenue. Thus, the difference of average percentage before and after the implementation of VAT is only 0.93%, implying that the contribution of VAT seems lower than what the government expected at the time of introducing VAT in the country. Figure 4.2 portrays the comparative trend of replaced tax revenue before and VAT revenue after the implementation of VAT.

Figure: 1

VAT revenue percentage before and after VAT policy enforcement of total revenue

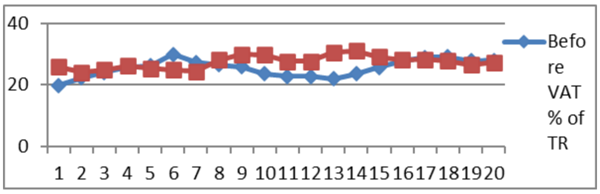

Figure 1 shows VAT registered growth in total revenue; however, the comparative proportionate contribution of replaced tax and VAT on total revenue registered a fluctuating trend during the study period. The percentage of replaced tax on total revenue was lowest, i.e. 19.87% in 1977/78 and highest 27.91 in 1996/97, averaging out at 26.66%. Similarly, the percentage of VAT on total revenue was lowest, i.e., 25.43% in 2001/02 and highest, i.e. 29.75% in 2006/07, making an average of 27.58%. The percentage of average difference between replaced tax and VAT is only 0.93%., which implies less average contribution VAT than the government's expectations.

GDP as dependent variable

The logical relationship as specified in the research framework hypothesizes that the national economy (GDP) is positively affected by VAT revenue, remittance and money supply, while there is a negative effect of market capitalization and government spending but a mixed effect of exchange rate on national economy (GDP). In order to examine the effect of each of these independent variables on economic development, a multiple regression has been used. For the purpose of examining the factors affecting the national economy (GDP), the empirical models have been specified with/ without government spending and money supply. As given in equations 1, .2, and 3

$$\ln GDP_{ct} = \beta_0 + \beta_1 \ln VAT_{ct} + \beta_2 \ln EXR_{ct} + \beta_3 \ln R_{ct} + \beta_4 \ln MC_{ct} + \beta_5 \ln MS_{ct} + \beta_6 \ln GS_{ct} + \ldots + e_i \quad (1)$$

$$\ln GDP_{ct} = \beta_0 + \beta_1 \ln VAT_{ct} + \beta_2 \ln EXR_{ct} + \beta_3 \ln R_{ct} + \beta_4 \ln MC_{ct} + \beta_5 \ln MS_{ct} + \ldots + e_i \quad (2)$$

$$\ln GDP_{ct} = \beta_0 + \beta_1 \ln VAT_{ct} + \beta_2 \ln EXR_{ct} + \beta_3 \ln R_{ct} + \beta_4 \ln MC_{ct} + \beta_5 \ln GSP_{ct} + \ldots + e_i \quad (3)$$

The results of regression equations 1, 2 and 3 specified for economic development as dependent variable in aggregate level and the VAT revenue as independent variable.

Table 6. Regression result of VAT and other intervening variables on GDP

Parameters/variables	Equation: 1	Equation:.2	Equation: 3
Constant (β_0)	3.5160*	.475088*	3.3292*
	[0.278532]	[0.093710]	[0.268329]
	{12.6234	{37.08334}	{12.40746}
VAT revenue (β_1)	0.42267*	0.405056*	0.315055 *
	[0.118697]	[0.035651]	[0.035651]
	{3.594918}	{11.20273}	{3.076335}
Exchange rate (β_2)	−0.15566*	−155664**	−0.16882**
	[0.055805]	[0.0538214]	[0.058717]
	{−2.7194}	{−2.89223}	{−2.50154}
Remittance (β_3)	0.08633**	0.087151*	0.094320*
	[0.016248]	[0.0014837]	[0.016394]
	{5.313224}	{5.874045}	{5.747861}
Market Capitalization (β_4)	−0.03067	−0.030798***	−0.020801
	[0.017793]	[0.017146]	[0.017683]
	{-1.72423}	{−1.796172}	{−1.17628}
Money Supply (β_5)	−0.0479*	0.04514***	
	[0.029486]	[0.022432]	
	{1.627576}	{2.012641}	
Government Spending (β_6)	−0.02645	----	0.142290
	[0.140643]	----	[0.168659]
	{-0.156874}	----	{1.011708}
Adjusted R^2	0.992	0.993400	0.9920
Durbin –Watson	2.417	2.363	2.033
F-statistics	783.2866	572.9784	476.42141
Jarque-Bera statistic	4.6726	4.418	3.556
Breusch-Godfrey LM Observed χ^2:	1.521	4.997	4.917
Breusch- pagon observed: χ^2:	5.134	9.633	8.641
Glejser test Observed: χ^2:	5.485	5.210	3.806
RAMSEY TEST: F – statistics $_{(1,12)}$:	3.1123	2.4320	3.2121
ARCH Observed: R^2:	0.036	0.041	0.711
Chow test F – statistics $_{(7,6)}$:	9.681673	881.4447	214.1074

Figures in parentheses [], {} indicates standard error and t-statistics of the concerned variables and p-value

The result of the regression equation 1, 2 1nd 3 specified. The regression results of all the three different equations provide equation 2 as an appropriate model. It is because the sign of the coefficient of all the variables are as per the expectations.

It is apparent from Table 6 that application of the JB statistic is about 4.6726, 4.4182 and 3.556. The null hypothesis that there is no normality in the model has been rejected. Durbin Watson d statistics of the model is 2.417, 2.363 and 2.033 using VAT and 5 intervening variables with 20 observations. The guideline of the theory is that d-statistics has to remain between d_u and (4-d_u) to confirm the no autocorrelation in the model. The econometric theory points out that the d-statistics has to lie between (d_u) and (4-d_u) to confirm autocorrelation in the model. From the result, it shows that d-statistics 2.417, 2.3636 and 2.0338 lie between upper bound (d_u) and (4-d_u) [i.e. $d_U < d < d_U$]. Thus, it confirms the absence of auto correlation in the entire model. But the value of DW d statistics lies in an indecisive area. $\chi 2$ is 4.997 and the p-value is 0.416 > 0.05. Therefore, it cannot reject null hypothesis or accept null hypothesis, implying that there is no serial correlation in the model. The observed $\chi 2$ is 9.633 and p-value i.e. 0.0.08 >0.05. So it cannot reject the null hypothesis, which means that there is no heteroskedasticity in the residuals of this model.

Glejser test: $\chi 2$ is 5.2107 and p-value i.e. 0.3907 > 0.05. Therefore, it cannot reject the null hypothesis indicating that there is no heteroscedasticity in the residuals of this model. The $F_{(1,12)}$: 2.7553 and p-value i.e. 0.00066<0.05. Therefore, it rejects the null hypothesis which indicates that the predicted value or value of a dependent variable is stable over the study period and for the prediction period. Test of Exogeneity: The test evaluates the consistency of an estimator when compared to an alternative, less efficient estimator which is already known to be consistent. It helps one evaluate if a statistical model corresponds to the data. Hausman's formal results apply not only linear models, but also maximum likelihood methods. However, test statistics is not possible due to small sample size of no. of observations i.e. 20 years of VAT implementation in Nepal. **Structural break test: Null hypothesis: There is no structural break in the time series data. Since $F_{(7, 6)}$:** 881.447 and p-value i.e. 0.0006<0.05, null hypothesis cannot be rejected, indicating that there is no structural break on time series data used for the model of the study period.

Multicollinearity test: Variables	VIF (1)	VIF (2)	VIF (3)
VATLOGC	150.399	15.299	100.165
EXRLOGC	2.611	2.6110	2.586
RLOGC	8.355	7.488	7.610
MCLOGC	10.231	14.412	12.758
LOGC	14.438	6.346	-----
LNGSPDC	161.664	-----	100.571

From the above three equations 1, 2 and 3, the second equation 2 is being employed for the error correction model. The time series data in the model involves at first difference. The residual of equation 2 is taken as an independent variable as shown in equation 4 as ($ECM_{(t-1)}$) in Table 7.

Error correction model (ECM)

Through the documentation of cointegration of a set of variables, the dynamics of economic development proxied by GDP was reconnoitered. The inclusion of a large number of lag lengths reduces the degree of freedom. However, because of the small sample size (need to preserve the degree of freedom) the first model includes only one lag on the dependent and independent variable. Where Δ is the first difference operator, ECM_{t-1} is the lagged error correction term from equation 2 of Table 6.

$$\Delta(\ln GDP_{ct}) = \beta_0 + \beta_1 \Delta\ln VAT_{ct} + \beta_2 \Delta\ln EXR_{ct} + \beta_3 \Delta\ln R_{ct} + \beta_4 \Delta\ln MC_{ct} + \beta_5 \Delta\ln MS_{ct} + \beta_6 \Delta\ln ECM_{t-1} + \beta_7 \Delta\ln GDP\beta_{t-1} \quad \text{- - - (5.6.4)}$$

Where, Δ is the first modification operator, ECM_{t-1} is the lagged error improvement term from equation 2 of Table.6.

Table 7
Cointegrated Regression Results

$$\Delta(\ln GDP_{ct}) = \beta_0 + \beta_1 \Delta\ln VAT_{ct} + \beta_2 \Delta\ln EXR_{ct} + \beta_3 \Delta\ln R_{ct} + \beta_4 \Delta\ln MC_{ct} + \beta_5 \Delta\ln MS_{ct} + \beta_6 \Delta\ln ECM_{t-1} + \beta_7 \Delta\ln GDP\beta_{t-1}$$

$$-3.6926 + 0.4270^{*}\,\Delta\ln VAT_{ct} - 0.0409\Delta\ln EXR_{ct} + 0.0706^{***}\,\Delta\ln R_{ct} - 0.03^{***}\Delta\ln MC_{ct}$$

[0.00523]	[0.07887]	[0.08473]	[0.03590]	[0.026132]
{-0.0052}	{5.4143}	{-0.4827}	{1.96906}	{-1.372}

$$+\ 0.033^{***}\ln\Delta MSi + 1.037\ln\Delta ECM_{t-1} - 0.027\ln\Delta GDP\beta_{t-1}$$

[0.015898]	[0.503341]	[0.196456]
{2.083}	{1.845}	{0.138900}

$F-_{(7,10)}$: (6.270475)* Adjusted R^2 : 0.8144

DW : 2.070645

Jarque-Bera	: 13.2955
Breusch-Godfrey LM. χ^2 :	: 2.1875
Breusch- pagon χ^2	: 2.1875
Glejser test χ^2	: 3.4518
RAMSEY TEST $F_{(2,7)}$	: 4.4826
ARCH R^2	: 0.4549
Chowtest $F_{(7,6)}$	: 4.43201

Multicollinearity test: Variables	VIF
VATLOGC_1	1.30
EXRLOGC_1	1.53
RLOGC_1	3.84
MCLOGC_1	2.83
MSLOGC_1	1.54
RES_1	3.02
GDPLOGC_2	2.03

The results of the first difference lagged GDP facilitate the long-run and short-run influence of the variables included in the model by satisfying R2 and F-statistics are satisfactory.

Table 7 satisfies the necessary conditions, demonstrating the presence of a sound model of GDP and VAT relationship and the prediction of VAT productivity. The first difference of intervening variables exchange rate, market capitalization, remittance, money supply and error term keeping constant, there is a positive significant impact of VAT in the economic development of Nepal.The R^2 shows that the explanatory power of the model is 0.81 indicating that 81% of the variation of GDP is explained to the extent of 81 percent variation of the independent variable included in the model. The diagnostic test suggests that the residuals do not violate classical assumptions. The lagged residuals from 52 equation of Table 7 ECM_(t-1)are statistically significant indicating the acceptable ground to take variable as cointegrated set. The result allows long run and short run dynamics of all the relationship between GDP and VAT. The estimated coefficient of VAT in error correction model shows that one percent point rise in VAT has led to 0.427 percent point increase in real GDP in short run, whereas it is found 0.46 percent point in the long-run. It means that the short-run marginal productivity of VAT is 0.427 percent point, whereas its long run percent point is 0.46.

Durbin Watson d-statistics 2.0706 lies between upper bound(d_u) and (4-d_u) [i.e. d_U< d < d_U], which confirms the absence of autocorrelation in the error correction model. The JB statistic is about 13.2955 and the probability of obtaining such a statistic under the normality assumption is about 0.001 and significant at 1% level. **Serial correlation test:** $\chi2$ is 2.1857 and the p-value is 0.8422 > 0.05. So, it cannot reject the null hypothesis indicating that there is no serial correlation in the model. The observed $\chi2$ is 2.1875 and probability i.e. 0.9487 >0.05. So it cannot reject the null hypothesis implying that there is no heteroskedasticity in the residuals of this model. **Glejser test:** $\chi2$ is 3.4518 and p-value i.e. 0.8403 > 0.05. So it cannot reject the null hypothesis, which means that there is no heteroscedasticity in the residuals of this error correction model.

Specification test: The $F_{(1,12)}$: 4.4826 and p-value i.e. 0.02304<0.05. So the null hypothesis has been rejected implying that the predicted value or value of the dependent variable is stable over the study period and for the prediction period. .

Structural break test: Null hypothesis: There is no structural break in the time series data. $F_{(7,6)}$: 4.4320 and p-value i.e. 0.352>0.05. So it cannot reject the null hypothesis, which indicates that there is no structural break.

Multicollinearity test: Null hypothesis: explanatory variables are not correlated. By observing the equation 5.6.4, the error correction model in Table 5.7. The VIF of the model or the VIF <10. So, it cannot reject the null hypothesis, meaning that explanatory variables are not correlated or the error correction model has no multicollinearity problem. Again, this variance inflation factor indicates that the variance of the weight coefficient is not inflated by a factor.

CONCLUSION

Therefore, the association between VAT and National economy GDP has positive connections in the long and short run. The projected factor of VAT in the error correction model displays that one percent point increase in VAT has led to 0.427 percent point upsurge in real GDP in the short run, while it is found to be 0.46 percent point in the long-run. It states that the short-run bordering productivity of VAT is 0.427 percent point, while its long run percent point is 0.46. Hence, OLS estimates of the bounciness and resilience coefficients for the sample are simulated. All issues for collaboration terms are as per anticipation though marginal, and statistically momentous, inferring a regular enhancement in VAT supervision. Additionally, it found approximations to be prejudiced if the DGP is not habituated by income tax freedom. Experiential consequences display that long-run resilience and bounciness factors for VAT are the bottommost, representing the areas of reform to be focused in VAT revenue supervision.

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