Unlocking Insights: Harnessing Card Data to Measure Namibia's Cross-Border Digital Services Imports

Joel Kagola, Brian Mbazuvara, Metilda Ntomwa, Maria Ngolo, Isabel Nghinamupika and Sanette Schulze Struchtrup[1]

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Abstract

Cross-border digital trade has increased rapidly, but data gaps remain in Namibia’s cross boarder statistics. This paper explored the use of card data for Namibia, following the OECD handbook on Measuring Digital Trade to derive estimates of cross-border digital purchases of services by Namibian residents, to improve coverage and data quality in line with the ongoing updates of BPM6. Moreover, the paper points out the limitations of using card data in measuring digital trade and suggests ways to improve data quality. Namibia’s digitally ordered and delivered services from abroad have grown in value since COVID-19, increasing from US$ 27 million recorded in 2020 to US$111.2 million in 2024, reflecting the growing popularity of streaming services, software and cloud computing, the use of digital intermediation platforms, and e-learning. The gender distribution of digital service purchases was predominately male across most categories with urban areas accounting for a significant share of transactions relative to rural areas, where limited internet access continues to constrain participation in digital trade.

[1] The views expressed in this paper are those of the authors and do not necessarily reflect those of the Bank of Namibia. The authors thank Dr. Johan van den Heever, Ms. Abigail Nainda and the External Sector Section team members from the Bank of Namibia for their support, helpful comments and suggestions.

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Introduction

In recent years, digital trade has grown exponentially, creating new markets for domestic consumers while also widening data gaps in external sector statistics. More households and businesses now transact with non-residents through online platforms, yet traditional data sources, which tend to focus on large firms, and high-value goods and services may only partially cover the low-value digital transactions conducted by small firms and households.

Digital trade, which is defined as "all international trade transactions that are digitally ordered[2] and/or digitally delivered[3]" was estimated to account for 54.0 percent of global services exports in 2022 and around 12.0 percent of total global goods and services exports (WTO, OECD, IMF, WB & UNCTAD, 2023. The rise in digital trade raises important statistical needs with serious policy implications. From a statistical perspective, and more so for a developing country like Namibia, understanding trends in the digital economy is imperative, both for domestic and international trade policy, as it affects competition, tax policy, development, and economic growth. Domestically, the Ministry of Finance has made considerations to introduce value added tax (VAT) on imported digital services from non-resident suppliers in the medium term to enhance fairness of the tax system.

The rise in payment gateways globally has been the core enabler of digital trade by connecting businesses operating online (mobile applications, websites etc.) with consumers from all over the world. According to Grand View Research (2023), the global market for payment gateways was estimated at US$26.8 billion in 2022, reflecting decades of technological progress and the surge in cross-border digital payments, especially after the COVID-19 pandemic. Closer to home, increased access to the internet and ecommerce platforms has allowed residents to transact with nonresidents merchants. This has further been enabled by less stringent regulations, where the Central Bank of Namibia does not have any regulatory restrictions for Namibian businesses and consumers to access, sell and receive payments on international online e-commerce platforms (Bank of Namibia, 2024).

Since its independence in 1990, Namibia has invested greatly in the modernisation and expansion of its telecommunication networks, resulting in improved broadband access to the internet and a more robust overall information and communication technology (ICT) sector. Additionally, Namibia's connection to the WACS cable and the landing of the Equiano cable position the country at a more advanced level of digital infrastructure, Bank of Namibia (2023). According to the Communication Regulatory Authority of Namibia (2024), the number of internet users has increased over the last ten years, rising from 0.8 million in 2013 to 1.7 million in 2024. The use internet users per 100 inhabitants, has also increased over the years, standing at 66.0 in 2024 reflecting Namibia's steady progress in digital connectivity. As digitalisation progresses, micro-digital trade has become significant. More Namibians are buying goods and services digitally from abroad, e.g., online shopping and studying, purchasing applications and software, subscriptions and ordering transportation and travel services abroad via Digital Intermediation Platforms (DIPs) including UBER, Airbnb, Takealot, Amazon and Grab.

Meanwhile, these cross-border transactions are not reflected in the official External Sector Statistics (ESS) produced by the Bank of Namibia (BoN) due to lack of data sources. Data from

[2] This refers to international e-commerce i.e. the international sale or purchase of a good or service, conducted over computer networks by methods specifically designed for the purpose of receiving or placing orders.

[3] This refers to all international trade transactions that are delivered remotely over computer networks.

debit and credit card transactions was previously unavailable as commercial banks only started providing the central bank with data on all international card transactions in 2019. Presently, the services data in the current account are sourced from the International Transaction Reporting System (ITRS) which covers cross-border wire transfers settled through SWIFT (Society for Worldwide Interbank Financial Telecommunication).

Against this background, this paper presents estimates of Namibian households' and businesses' digital purchases of services from non-residents based on card transaction data. The paper thereby provides the building blocks needed to enhance the data on the current account by including digital cross-border transactions in services paid for using debit, credit and hybrid cards.

The rest of the paper is organised as follows: Section 2 briefly reviews the related literature. Sections 3 and 4 cover the data source as well as the data transformation undertaken to clean up and convert the “raw” data into orderly categories. Section 5 details the estimation approach, where it is necessary to adjust the card-based transaction values to estimate their corresponding entries in the current account of the balance of payments. An analysis of key statistical findings is covered in Section 6 and the challenges of using card payments data are contained in Section 7. Section 8 provides the conclusion and suggests further areas of research.

Related literature

In terms of balance of payment statistics, greater focus on digital trade has been lacking and is to be addressed in the *seventh edition of the Integrated Balance of Payments and International Investment Position Manual* (BPM7). There is limited literature on the measurement of cross-border digital trade although the newly released Handbook on Measuring Digital Trade by the IMF, OECD, WTO and UNCTAD provides the conceptual framework as well as guidance on the various sources and methods for compiling digital trade statistics and this paper is closely related to three recent studies, which are highlighted in the following paragraphs.

Meinusch and Hessel (2017) estimated the cross-border digital purchases of German private households using freely available internet data following a bottom-up approach. The approach broke down the market for digitally traded services into five segments, namely video-on-demand, digital audio content, buying and using software, gambling, and cloud services as they were considered the most significant in terms of household demand for digital services. The study focused on services delivered via digital channels by foreign enterprises to resident private households and excluded digitally ordered goods or services provided by German private households to non-residents as data was rather limited. The paper highlighted the limitations of using freely available internet data as it may not be readily available and does not meet all the requirements for use in the compilation of the balance of payments.

Yezekyan (2018) explored various data sources to measure e-commerce transactions in Armenia for balance of payments purposes. The study utilized administrative data from Armenia's payment and settlement organization, Customs Service, along with additional information from the Armenian Processing Centre (ArCa) database. The Customs Service classifies granular data on goods based on the type of receiver; however, it may be biased as it only includes goods received from large e-commerce companies and through parcel delivery services. Data from the payment and settlement systems enables the generation of statistics on cross-border acquisitions of goods and services; however, distinguishing between goods and services is impossible. Conversely, ArCa can accurately identify e-commerce transactions conducted abroad. However, looking at transactions conducted within Armenia, there is a drawback in distinguishing non-residents' e-commerce transactions.

The Central Reserve Bank of El Salvador (2023) has undertaken efforts to measure cross-border digital trade using credit and debit card payment data since 2021. El Salvador used data from financial institutions on online purchases made overseas with cards issued by domestic commercial banks, as well as purchases made domestically using cards issued by foreign commercial banks. The bank employed a Python script designed to consolidate multiple datasets into a single database, while also executing data-cleaning tasks and standardizing business names. Subsequently, data visualization software was employed to create an interactive dashboard that displayed statistics on cross-border digital trade, offering valuable insights into the e-commerce landscape.

At present, data sources for digital trade typically include Information and Communications Technology (ICT) surveys, customs data, household surveys, and business surveys as well as the ITRS as outlined in the Handbook on Measuring Digital Trade. Several other countries adopted the above measurement approaches. For example, China initiated its digital trade measurements in 2014 by utilising its customs records, survey data, and various sources aimed at streamlining the customs clearance process for digitally ordered goods. However, customs records alone could not capture the overall amount of cross-border e-commerce (CBEC), as not all digitally ordered goods are declared to customs especially goods below the customs threshold. Furthermore, the primary challenges identified included effective collaboration with data producers to acquire detailed data from overseas platforms, data granularity, and data accuracy.

Another instance mentioned in the Handbook is the case of Jamaica, which utilised the Tourist Satisfaction Survey (TSS) and Tourist Expenditure Survey (TES), credit card data, customs data and administrative data on tax declarations to measure the export and imports of digital trade services. However, the credit card information does not enable precise identification of products, nor does it distinguish between resident and non-resident transactions. Similarly, the Israeli Central Bureau of Statistics (CBS) collects data on credit card transactions and concentrates primarily on online purchases; however, the data relates exclusively to household transactions. Other countries, such as Indonesia, used an innovative approach that relied on data analytics to identify the so-called "digital traders" and match their transactions from five separate databases to compile statistics on digital trade.

Data source

The ITRS was used as the main data source for this study, comprising of a module on card payment data. In the case of Namibia and the other Common Monetary Area (CMA) members (Eswatini, Lesotho and South Africa), the ITRS is referred to as the Balance of Payments Customer Reporting System (BOPCUS), which captures all cross-border transactions between Namibia and the rest of the world. The BOPCUS system was initially developed as a foreign exchange system designed to effectively manage capital flow regulation responsibilities; however, over time, it became a crucial data source for the compilation of ESS. The system has undergone several enhancements since its inception, with the latest improvement completed in 2019, aimed at aligning the system to the BPM6. All commercial banks are required to report daily foreign transactions to the central bank via the system irrespective of the value.

Commercial banks began providing the central bank with data on all international card transactions since July 2019. Thus, the study covered the annual data from 2020 to 2024. The ITRS data is based on three payment transfer modules, namely BOPCUS, which contains data on cross-border wire transfers, Bobcard Resident and Bobcard Non-resident, which covers credit and debit card transactions. The Bobcard Resident module covers transactions of debit and credit cards issued by Namibian commercial banks used to pay for services or goods purchased from foreign merchants, while the Bobcard non-resident module covers transactions of debit and credit cards issued by foreign commercial banks. Granular information such as merchant names and codes at an individual transaction level are only available on the Bobcard Resident module (i.e Namibian-issued cards) and not on Bobcard Non-resident. Therefore, this allows for the compilation of import of services. Nonetheless, for both transfer modules, the reported data is strictly cross-border with no reporting thresholds, resulting in coverage of all microtransactions. Against this background, the study focused on using Namibian-issued cards to non-resident merchants' data as a source for measuring import of digital services.

While the BOPCUS makes provision for including information on whether the card was used at an e-commerce merchant or a point-of-sale device abroad, these fields are, however, not yet mandatory for reporting entities making it difficult to determine whether the card was used physically (card present) or remotely (card absent). To remedy this problem the study used Merchant Category Codes (MCC) and merchant names to identify a merchant's business activity and to indicate whether the good or service was digitally ordered, and/or digitally delivered. The four-digit MCC obtained from the Visa Merchant Data Standards Manual are used to describe a merchant's primary business activity according to the type of goods and/or services traded. Hence, MCCs and merchant names made it possible to have an idea of card absent transactions or online transactions, mainly those payments made via internet such as subscriptions.

To ensure robustness of the granular card data estimates, an additional data source was also employed, namely the aggregate cross border card data obtained from the National Payment Systems Department (NPS). This data source was primarily used for cross checking purposes. The aggregate data are submitted by commercial banks to the central bank on a quarterly basis for regulatory compliance purposes. Unlike the granular card data, the aggregate card payments data from the NPS contains important breakdowns on where the card was used, whether at Point-of-Sale (POS) terminals, Automated Teller Machines (ATMs), or online. This distinction made it possible to identify card absent transactions at an aggregate level and made it easier to verify the accuracy of the estimates derived from the granular data.

Data transformation and estimation approach

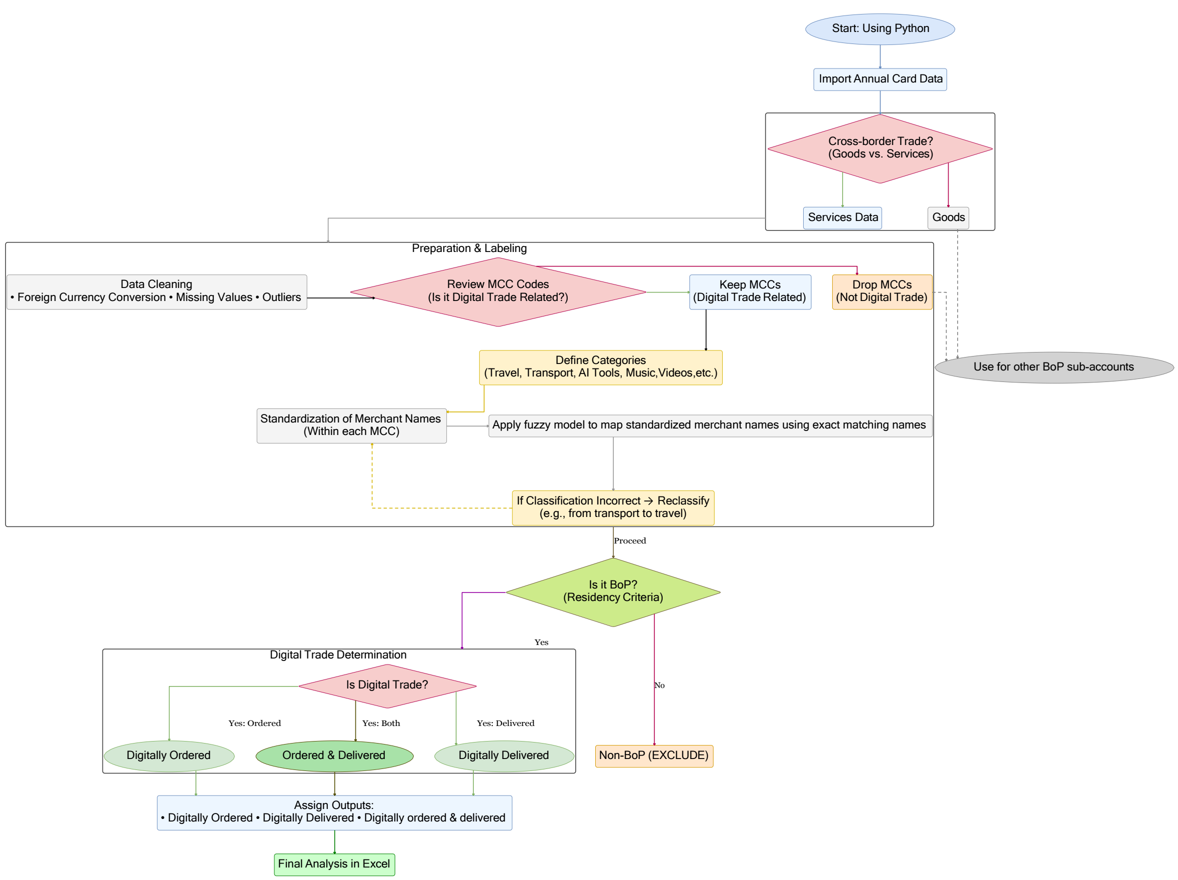
The data was cleaned and transformed in the following manner: firstly, "raw" large Microsoft Excel files that exceeded the Excel limit of approximately 1.4 million rows of records per month were extracted from the BOPCUS database. After that, data cleaning was done using Python scripts to take care of anomalies resulting from missing values, currency conversions and text-to-number conversions. Python was used for additional checks as well as transformation. This process entailed the classification of the data into market segments based on merchant names and codes in accordance with the VISA Merchant Data Standards manual, while also ensuring alignment with digital trade definition and balance of payments standards (Figure 1). Subsequently, cross-border digital purchases of services were estimated following the estimation approach below.

The flow map in Figure 1 outlines the methodological workflow used to estimate cross-border digital trade in services using annual card transaction data processed through Python. The approach follows a structured, iterative process; beginning with data importation and cleaning, followed by classification, residency filtering, and digital trade determination; to ensure that only BoP-relevant, digitally ordered and/or delivered transactions are retained for analysis.

Not all card transactions represent digital trade as defined in the Handbook on Measuring Digital Trade (OECD, IMF, WTO, UNCTAD & WB, 2023). The inclusion of MCC codes as part of digital services depended on whether the transactions were card absent (remote) or card present (non-remote) as well as the business activity of the merchant. Most of the MCC codes that related to ATM withdrawals, non-digital goods purchases, and other non-digital services were completely excluded. As such, about 191 MCCs were fully excluded, while 347 MCC codes were included to cater for classification and further adjustments. Digital trade was measured based on the second edition of the Handbook on Measuring Digital Trade, which defines it as “all international trade that is digitally ordered and/or digitally delivered.” The handbook outlines three criteria for identifying digital trade: the nature of the transaction (how), the product (what), and the partners involved (who), as illustrated in (

Annexure 1) and explained further below.

Figure 1: Flow map of the estimation approach



The first criterion relates to how the transaction was conducted. For a cross-border transaction to be considered part of digital trade, it must be digitally ordered and/or digitally delivered. Given that the data used was sourced from card payments and having full awareness that the payment for and delivery of the good or service do not have to be online, caution was followed when dealing with the data, since card data covers both digital and non-digital trade.

To define the categories, the MCC codes and their descriptions and names were used to determine each merchant business activity and to assess whether the associated service was digitally ordered, and/or digitally delivered, with particular focus on MCCs associated with online service providers and digital services. Within each MCC, all merchant names were reviewed and standardized keywords were developed and mapped to the relevant categories (Figure 1). Considerable manual effort was devoted to identifying the business activities of individual merchants, drawing extensively on MCC descriptions and supplementary online searches to ensure accurate classification. Digitally traded services was broken down into thirteen market segments, including video downloads and streaming; music downloads and streaming; software, cloud and storage services; applications; online gaming; online gambling; online dating services and adult content; online courses, eBooks, newspapers and audiobooks; digital advertising (including social media and influencer platforms); AI subscription services; transportation services; travel and other services. In addition, the analysis also considered digital services ordered through Digital Intermediation Platforms[4] (DIPs).

The manually standardised sample of merchant names was first mapped to the full annual dataset using exact name matching, and the fuzzy-matching model was then applied to match and align the remaining name variations. The resulting output was exported as CSV files, followed by a secondary keyword review within each MCC category. Any misclassifications identified were manually corrected, and the adjustments were incorporated into the Python code, which was then rerun to produce the final corrected output. The output was also carefully reviewed to identify and exclude non–BoP transactions based on residency criteria, for instance, payments between by residents via international online platforms such as Airbnb merchants were excluded, as they represent resident-to-resident transactions rather than cross-border flows.

Finally, transactions passing the residency tests were classified according to the digital trade conceptual framework, distinguishing between digitally ordered services and digitally deliverable services. The former covers services ordered online but consumed physically, such as travel services booked through platforms like UBER, Booking.com and Airbnb, as well as online tickets for sport events or transport. The latter covers services that are digitally delivered, which include downloadable software, music video, cloud storage and online gaming, just to mention a few. This classification framework provides a structured and internationally comparable estimate of Namibia’s cross-border digital trade in services. The use of card data has been adopted by several other countries, including Canada, Argentina, Ireland, and Armenia. However, the comprehensiveness of the market segments largely depends on data availability (WTO, OECD, IMF, WB, and UNCTAD, 2023).

Digital trade analysis

Card payment developments

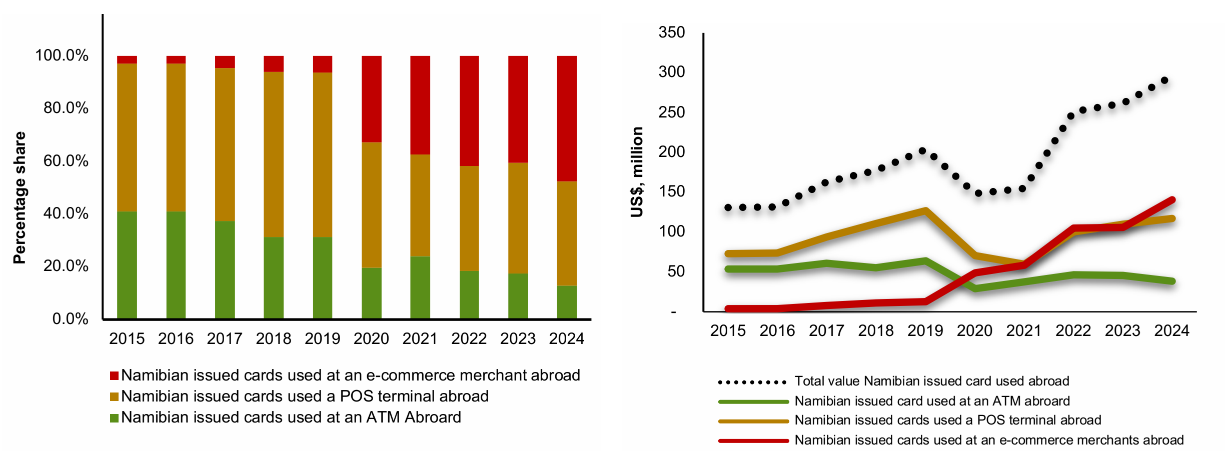
The data on Namibian-issued card payments to non-residents showed an upward trend between 2020 and 2024, reflecting a structural shift in how households and businesses transact

[4] DIPS are defined as “Online interfaces that facilitate, for a fee, the direct interaction between multiple buyers and multiple sellers, without the platform taking economic ownership of the goods or rendering the services that are being sold (intermediated).”

across borders. Payments from Namibian-issued cards to non-residents rose by 62.3 percent in 2022 to US$251.6 million and by a further 3.9 percent in 2023 to US$261.5 million. The most notable change was in e-commerce usage abroad with payments to foreign electronic merchants increasing substantially from a meagre 6.4 percent of total card outflows in 2019 to 47.5 percent in 2024 (Figure 2). Following the COVID-19 pandemic lockdowns, payments to e-commerce merchants abroad accelerated as more Namibians digitally ordered goods and services from abroad, such as purchasing applications or software, online learning and placing orders for services abroad via digital intermediation platforms (Amazon, Alibaba, UberEATS, Airbnb, etc.).

Figure 2: Namibian-issued cards data usage by category

Since 2020, the use of Namibian-issued cards at e-commerce has increased significantly and surpassed all other all categories in 2024, mainly reflecting an increase in digital trade by households.



Source: Bank of Namibia, National Payment Systems and Financial Surveillance

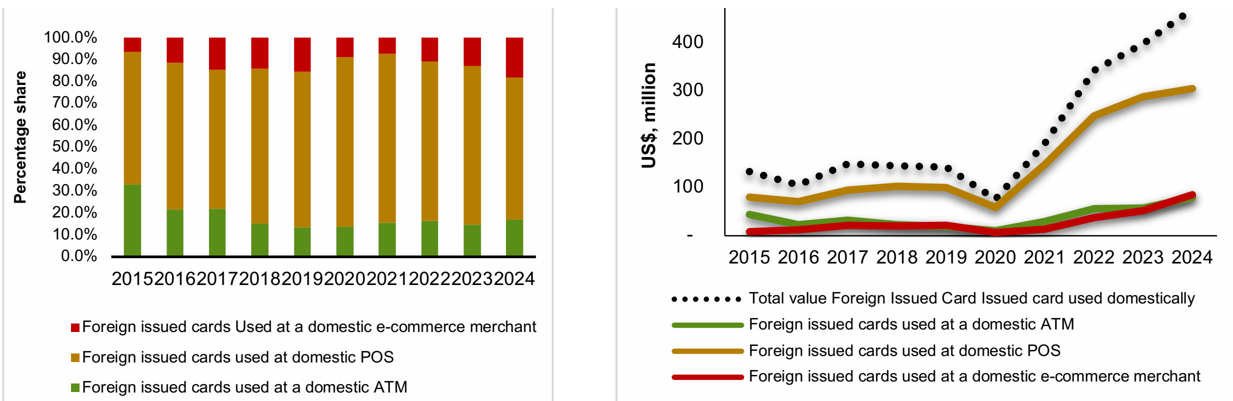
Note: All figures are based on aggregated and anonymised card transaction data reported by commercial banks to the central bank.

In contrast, the share of point-of-sale (POS) card payments abroad declined between 2020 and 2021, in line with the domestic COVID-19 travel restrictions, before recovering modestly in 2023. These travel restrictions were implemented at the end of March 2020 and were only fully lifted by the third quarter of 2022. To this end, data shows the share rebounded slightly in 2023 and increased further in 2024, as more Namibians resumed traveling abroad. The use of cards for cash withdrawal also continued to decline, consistent with the broader global transition to digital payments, with the percentage share of cash withdrawals dropping from 31.6 percent in 2019 to 13.1 percent in 2024. This compositional shift suggests that card data increasingly captures digitally ordered trade, particularly low-value transactions that are otherwise absent from traditional data sources.

From a balance of payments perspective, outward card payments now represent nearly 9 percent of Namibia's recorded services imports during 2024 (which is currently compiled from other sources, including the ITRS, surveys and administrative records). The inclusion of card data could significantly improve estimates for travel and other service subcomponents, particularly household-level imports of digital services. The Namibian experience mirrors trends in other developing economies, such as El Salvador, where central banks have turned to card data to bridge gaps in measuring digital trade. Going forward, integrating such data alongside ITRS wire transfers, VAT records, and surveys could help ensure BPM7 compliant statistics while also improving the coverage of emerging forms of cross-border economic activity.

Figure 3: Foreign-issued cards data usage by category

Since 2020, the use of Namibian-issued cards at e-commerce has increased significantly and surpassed all other all categories in 2024, mainly reflecting an increase in digital trade by households.



Source: Bank of Namibia, National Payment Systems and Financial Surveillance Department

The use of foreign issued cards at domestic merchants has increased rapidly since 2020 in line with the rebound in international and regional travel (Figure 3). These represented the export of services. The increase was more concentrated in the share of foreign issued cards used at domestic POS terminals which accounted for 65.0 percent of card payments by non-residents in 2024, reflecting travel related purchases by non-residents. The share of foreign issued cards used at domestic e-commerce merchants remained relatively smaller at 18.0 percent in 2024 albeit increasing in recent years, from 8.7 percent in 2020. This largely reflects the limited number of domestic online merchant platforms as well as payment gateways. There is currently about eight licensed payment gateway providers in Namibia.

Digital services imports

Total digital services[5] ordered and/or delivered digitally rose steadily since 2020, increasing by a cumulative US$76.7 million to reach US$111.2 million in 2024 (Table 1). This represented around 4.5 percent of Namibia's total services imports during 2024. The strongest growth was recorded in travel services, which expanded more than fivefold over the period (US$7.7 million in 2020 to US$39.5 million in 2024), reflecting the rebound in international mobility after COVID-19 restrictions. Transport services likewise recorded a notable rise, supported by the resurgence in travel activity. Online education and related content (courses, eBooks, newspapers, audiobooks) also grew markedly, from US$3.5 million in 2020 to US$9.1 million in 2024, pointing to the rising demand for digital learning tools. Software and cloud services maintained a robust trajectory, reaching US$9.8 million in 2024, while video streaming services more than doubled to US$6.6 million. This indicates the increased usage and access to the internet and technology by Namibians to purchase services from non-residents, highlighting changing consumption patterns among households.

[5] To avoid double counting of trade in goods, total digital services exclude DIPs transactions. This is because transactions intermediated via DIPs are, in principle included in conventional trade statistics.

Table 1: Total Digital Services

US$ million	2020	2021	2022	2023	2024
Total Digital Services	**34.4**	**55.6**	**83.0**	**86.9**	**111.2**
Video downloads or streaming services	3.3	4.2	4.5	4.8	6.6
Music downloads or streaming services	0.3	0.4	0.5	0.9	1.2
Software, cloud and storage services	4.7	6.1	6.7	7.8	9.8
Applications	3.2	3.9	6.8	5.8	8.0
Online gaming	1.5	1.7	1.7	2.5	2.6
Online gambling	1.3	1.7	0.9	2.9	3.2
Online dating services and adult content	0.5	0.4	0.5	0.7	0.5
Online courses, eBooks, newspapers and audiobooks	3.5	5.6	6.7	7.8	9.1
Digital advertising (including social media and influencer platforms)	2.0	4.4	5.1	3.6	4.5
AI subscription services	0.0	0.1	0.1	0.2	0.2
Transportation services	3.5	10.4	21.5	16.2	19.2
Travel	7.7	13.0	24.1	30.3	39.5
Other services	2.6	3.6	3.9	3.3	6.6
Off which DIPs	3.4	6.4	7.1	7.6	9.0

Source: Author's compilation

Looking at the split between digitally delivered and digitally ordered but not digitally delivered, there is a change in dynamics between 2020 and 2024. While both digitally delivered services and digitally ordered services increased, growth was more pronounced in the latter. Digitally ordered but not digitally delivered services expanded from US$15.4 million in 2020 to US$69.0 million in 2024, outpacing digitally delivered services, which rose from US$19.0 million to

US$42.1 million over the same period (Table 2). This divergence reflects the post-COVID rebound in travel and transportation services. Many of these services were ordered digitally such as flight bookings, and accommodation reservations, but the actual service was consumed physically. Digitally delivered services on the other hand, such as streaming, software and cloud computing, and online learning, continued to grow steadily.

Table 2: Total Digital Services Imports

US$ million	2020	2021	2022	2023	2024
Digitally delivered services	19.0	26.2	30.8	34.0	42.1
Digitally ordered services, but not digitally delivered [1]	15.4	29.3	52.2	52.9	69.0
Total Digital services	**34.4**	**55.6**	**83.0**	**86.9**	**111.2**

[1] This category caters to the fact that some digital purchases of services, such as travel and transport services, can be ordered online but not delivered digitally.

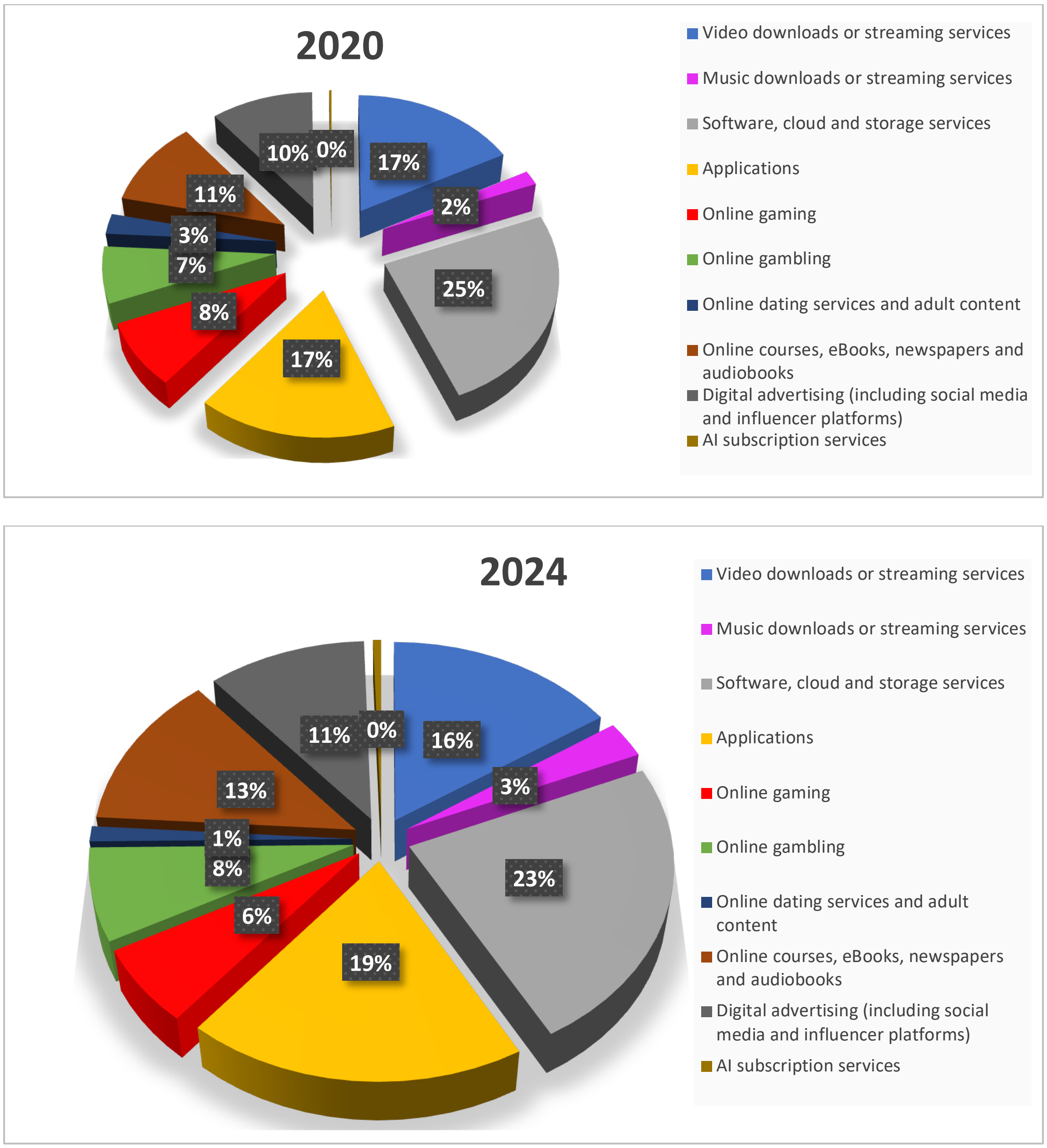
Sources: Authors' computation

Software, cloud storage and *application* remain the largest categories of digitally delivered services imports with the expenditure rising from US$4.7 million and US$3.2 million in 2020 to US$9.8 million and US$8.0 in 2024 (with a share of 23.3 percent and 19.1 percent, respectively, of total digitally delivered services). This primarily reflects payments for the usage of storage space from major international providers such as Google, Microsoft, Amazon Web Services and Apple as well as subscriptions to platforms like ZOOM that gained prominence during the pandemic due to the remote working. While businesses account for most of this spending, some households also purchase additional storage space from sites such as Dropbox, iCloud and OneDrive.

Video streaming accounted for 15.6 percent of digitally delivered imports in 2024 (Table 1), doubling in value from US$3.3 million in 2020 to US$6.6 million in 2024. This reflects the growing popularity of downloadable video and streaming platforms such as Netflix, Apple TV and Amazon Prime, which appeal to consumers due to relatively lower subscription fees, convenience and advert-free content, compared to some local and regional cable television services. Furthermore, these platforms use AI tools to filter large content and offer users a personalised experience. In this regard, Netflix remained the video streaming platform most used by Namibians, followed by Apple TV and Amazon Prime Video. To capitalise on the change in trends, a leading regional cable television provider introduced video-on-demand services, such as Showmax, which gained momentum from 2022.

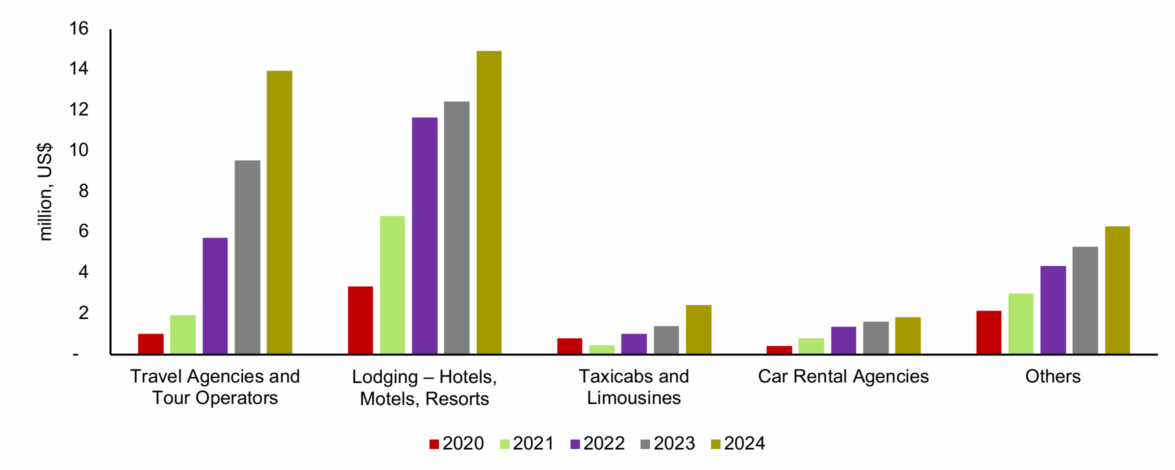
Other important categories comprise of online learning (including eBooks, newspapers, audiobooks), with a share of 12.8 percent in 2024. This underlines the growing role of digital tools in expanding access to international education and information to Namibians without the need to travel. Payments for online gaming and gambling took up a combined share of 13.8 percent, with online games having picked up from US$1.5 million in 2020 to US$2.6 million in 2024. Interestingly, the use of cross-border online gambling platforms such as South Africa’s Lottostar and Betway increased notably between 2020 and 2024. The rest of the cross-border payments for digitally delivered services were music downloads and streaming, with Namibians spending about US$1.2 million on subscriptions for platforms such as iTunes, Spotify, and Deezer in 2024.

Figure 4: Share of digitally deliverable services



Digitally ordered services that are not digitally delivered were more prevalent in transportation and travel related categories, rising from US$15.4 million in 2020 to US$69.0 million in 2024. About 57 percent of this increase relates to payments for travel services, particularly for online bookings to travel agencies and tour operators as well as lodging, hotels, motels, ride-hailing and automobile rentals abroad (Figure 5). Other notable components include the online purchase of airline tickets and the use of international shipping sites such as MyUs.com, ARAMEX and Mygermany.com, which Namibian residents increasingly relied on for cross-border delivery of goods, as well as the import of digital services related to transportation services.

Figure 5: Import of travel services ordered digitally



Digital Intermediation Platforms (DIPs)

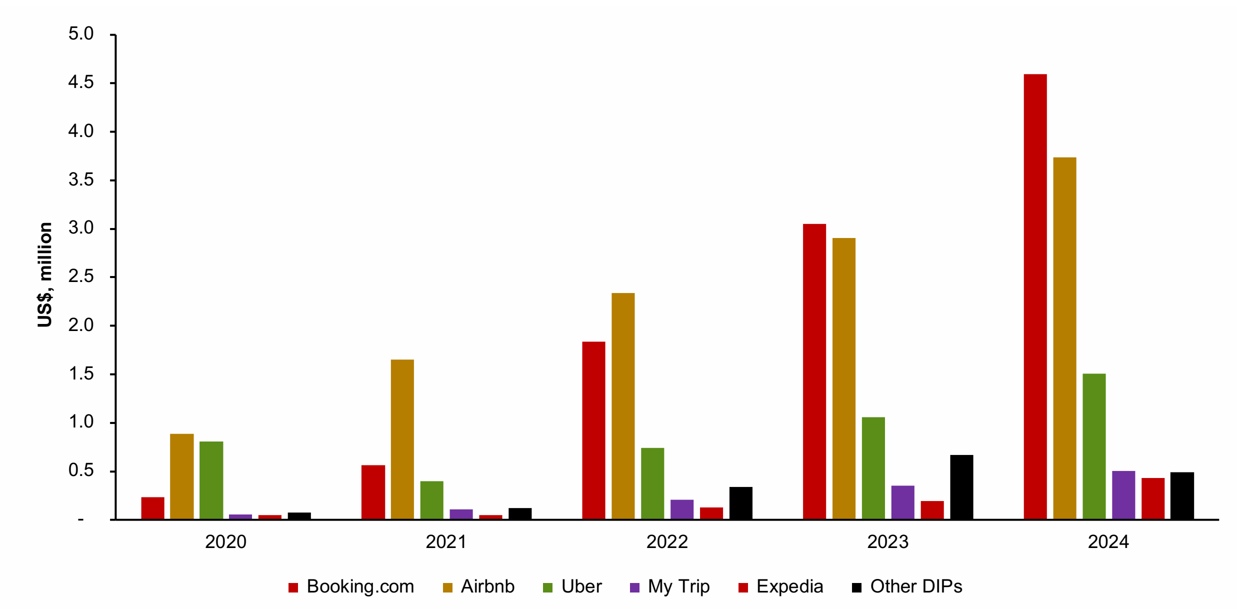
Platform enabled transactions remain one of the fastest-growing categories of Namibia's digital trade. DIPs are online platforms that, for a fee, facilitate direct interactions between various buyers and sellers without the platform taking economic ownership of goods or services being exchanged. The value of cross-border payments for services via DIPs increased from US$3.4 million in 2020 to US$9.0 million in 2024, reflecting their growing role in Namibian consumers' and businesses' transactions.

The usage of platforms such as Airbnb, Uber, Booking.com and Expedia growing role in Namibian consumers' and businesses' transactions (Figure 6). Airbnb and Booking.com registered the highest growths; while lower in 2020 due to travel restrictions, its usage resumed from 2021 onwards in line with the easing of travel restrictions. Services like Airbnb, Booking.com, and Uber are digitally ordered but not digitally delivered. Users install an app on their devices, provide their details, such as credit card information and their address, and make payments via the app. From a geographical perspective, Namibians primarily used DIPs originating from the Netherlands, the United Kingdom, South Africa and the United States, underscoring the global spread of platforms shaping the country's digital trade profile. This growing usage of DIPs highlights both an opportunity to capture new forms of cross-border activity and a challenge for balance of payments compilers, who must ensure proper classification between digitally ordered, digitally delivered categories as well as cross-border fee charges involved.

When Namibian property owners list accommodation on international platforms such as Airbnb or Booking.com, they pay a commission or service fee to the platform, which is considered an import of services in balance of payments terms. Airbnb typically hosts a service fee of about 3 to 5 percent of the booking value under its host-only fee model, or up to 15 percent under the split-fee model, where costs are shared between host and guest (Airbnb Help Center, 2024). Booking.com, by contrast, applies an average commission of around 15 percent, though this can range from 10 to 20 percent depending on property type, location, and cancellation policy (Booking.com Partner Hub, 2024).

Similarly, Namibian guests booking accommodation on these international platforms also incur guest service fees, which typically range from 6 to 14 percent of the booking cost on Airbnb and may include additional platform or transaction fees on Booking.com, depending on the payment method and property policy (Airbnb Help Center, 2024; Booking.com Partner Hub, 2024). These charges are collected and remitted abroad, meaning both Namibian hosts and guests make outward payments to non-resident digital intermediation platforms, the former as commission deductions and the latter as service fees. Together, these represent imports of digital intermediation services and contribute to the measurement of cross-border digital trade in Namibia.

Figure 6: Major travel service-related DIPs



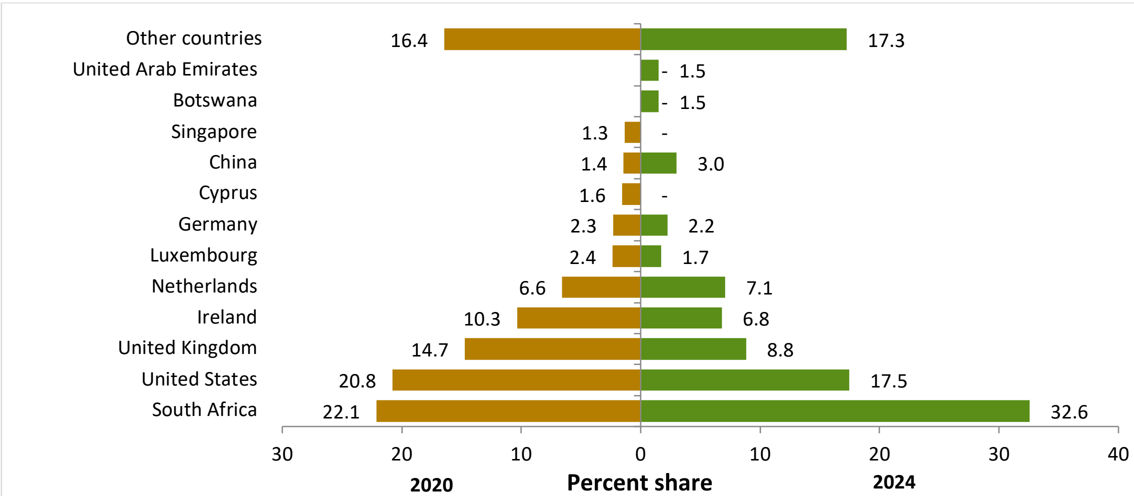
Digital trade outflows by direction and currency

The distribution of cross-border digital service payments remained highly concentrated among a few key destinations. South Africa continued to dominate as Namibia's main counterpart, with its share rising from 22.1 percent in 2020 to 32.6 percent in 2024, reflecting strong linkages in travel services and digital intermediation platforms operating across the Southern African region (Figure 7). The United States accounted for the second-largest share at 17.5 percent, down slightly from 20.8 percent in 2020, largely associated with software, cloud, and storage services, as well as online learning.

The United Kingdom ranked third, decreasing from 14.7 to 8.8 percent, supported by digital intermediation, travel, and online education services. Ireland and the Netherlands followed with 6.8 and 7.1 percent, respectively; both countries hosting major technology and digital service providers such as cloud and streaming firms.

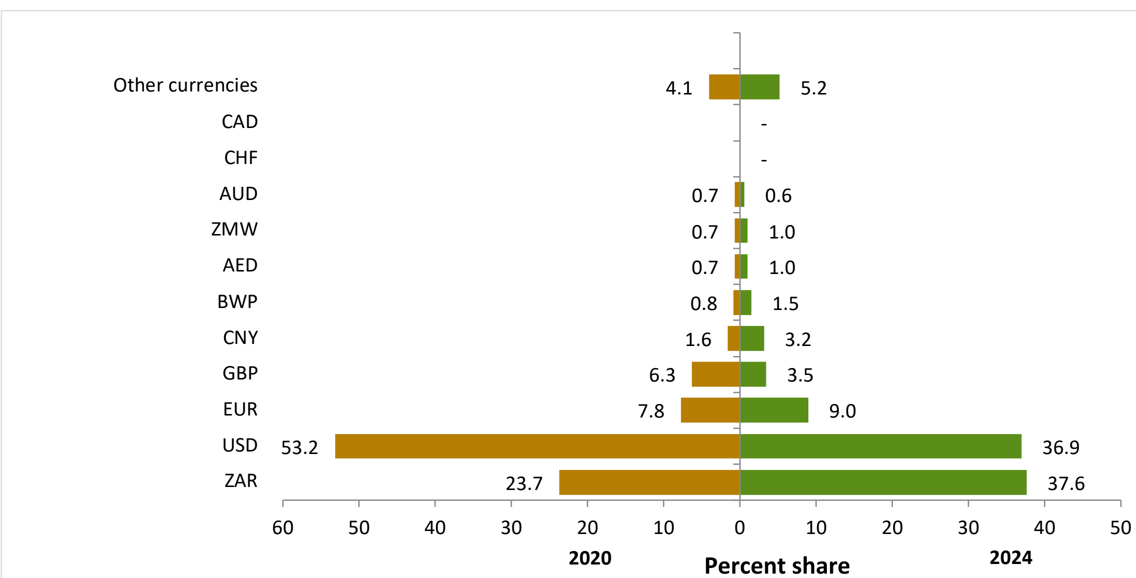
Smaller but growing destinations include China and Singapore, whose shares rose to 3.0 and 1.5 percent, reflecting rising payments for AI tools and platform-based services. Meanwhile, other countries collectively held a stable share of around 17 percent, suggesting a moderate diversification of Namibia's digital import destinations.

Figure 7: Geographical location of digital purchase



The currency distribution of Namibia's cross-border digital payments remained highly concentrated in South African Rand (ZAR) and United States Dollar (USD), which together accounted for nearly three-quarters of all transactions in both 2020 and 2024. The ZAR share increased notably from 23.7 percent in 2020 to 37.6 percent in 2024 (Figure 8), underscoring Namibia's strong regional integration with South Africa, where many digital platforms and payment gateways are domiciled. In contrast, the USD share declined from 53.2 percent to 36.9 percent, suggesting a gradual diversification away from U.S. denominated digital transactions.

Figure 8: Currency of invoicing of digital purchases



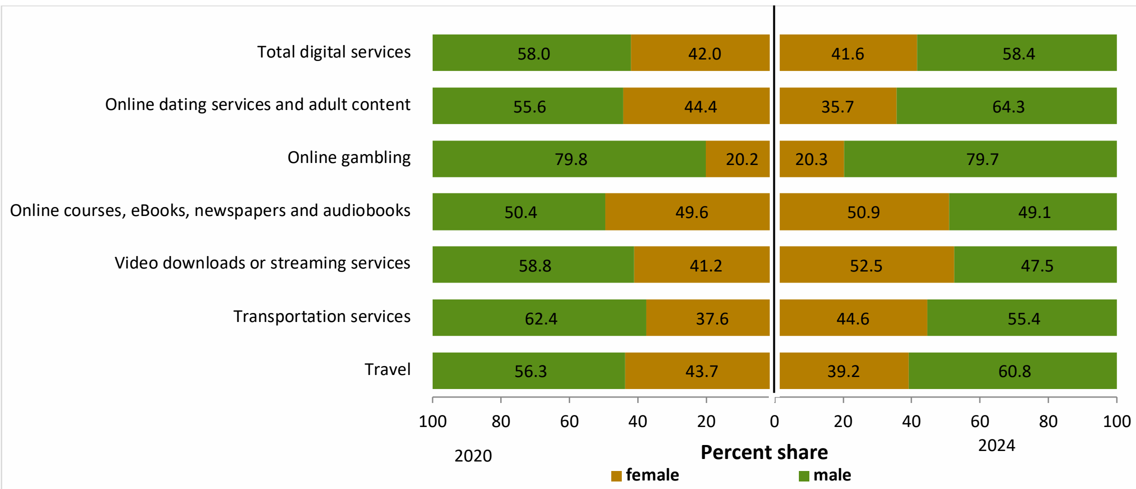
Other major currencies maintained relatively small shares. The Euro (EUR) rose slightly from 7.8 to 9.0 percent, reflecting continued transactions with European-based digital service providers, while the Chinese Yuan (CNY) more than doubled from 1.6 to 3.2 percent, indicating growing digital linkages with Chinese platforms. The British Pound (GBP) and Swiss Franc

(CHF) each contributed less than 4 percent, while African regional currencies such as the Botswana Pula (BWP), Zambian Kwacha (ZMW), as well as the United Arab Emirates Dirham (AED) collectively accounted for under 3 percent of total payments.

Digital services imports by gender, region and age group

The gender distribution of digital service purchases through Namibian-issued cards shows a clear shift toward male dominance across most categories between 2020 and 2024. Overall, the share of male consumers of digital services rose from 42.0 percent in 2020 to 58.4 percent in 2024, indicating a reversal in the gender composition of Namibia's cross-border digital consumption.

Figure 9: Selected digital trade services segments by gender



At a category level, online gambling and online dating and adult content services remain heavily male-driven, with male shares of approximately 80 percent and 64 percent, respectively, in 2024. Meanwhile, categories such as video streaming and transportation services also saw a rise in male participation, reflecting broader post-pandemic normalization of travel and entertainment consumption. By contrast, female participation remains relatively strong in online courses, eBooks, and audiobooks, where consumption was almost evenly split at around 51 percent for females and 49 percent for males in 2024, suggesting that educational and information-based digital services remain appealing to both genders. The narrowing gender gap in this segment could also reflect increased digital literacy and access among women during the period.

The overall shift toward male dominance in digital trade may partly reflect the resumption of mobility-related digital purchases (e.g., airline, hotel, and transport bookings) and the growing male engagement in online leisure and betting platforms, which tend to dominate card-based digital transactions. Nonetheless, the balanced participation in knowledge-based and streaming services signals a gradual broadening of digital inclusion across genders in Namibia's digital economy.

Table 3: Percent share of Digital Services imports by age, 2020

Percent share	Children	Working age (Active Adult Population)		Elderly
		Youth	Adult	
Total Digital Services	**0.5**	**29.3**	**45.0**	**25.2**
Video downloads or streaming services	1.0	47.4	45.3	6.3
Music downloads or streaming services	0.6	44.6	45.1	9.7
Software and cloud services	0.5	19.8	36.8	42.9
Online gaming	2.7	41.2	46.1	10.0
Online gambling	0.2	53.9	37.0	8.9
Online dating services and adult content	0.0	18.4	38.0	43.5
Online courses, eBooks, newspapers and audiobooks	0.2	29.8	56.3	13.7
Transportation services	0.0	17.2	50.9	31.9
Travel	0.2	29.6	44.0	26.2
Other services	0.6	27.0	43.4	29.0

Table 4: Percent share of Digital Services imports by age, 2024

Percent share	Children	Working age (Active Adult Population)		Elderly
		Youth	Adult	
Total Digital Services	**0.3**	**21.4**	**47.3**	**31.0**
Video downloads or streaming services	0.9	38.3	51.6	9.2
Music downloads or streaming services	0.8	40.4	49.0	9.8
Software and cloud services	0.4	13.2	33.3	53.1
Online gaming	1.7	37.8	48.5	12.1
Online gambling	0.3	20.0	67.4	12.3
Online dating services and adult content	0.5	19.5	55.9	24.1
Online courses, eBooks, newspapers and audiobooks	0.3	30.9	53.6	15.2

Transportation services	0.1	20.3	46.7	32.9
Travel	0.1	16.6	50.1	33.1
Other services	0.4	22.7	40.5	36.5

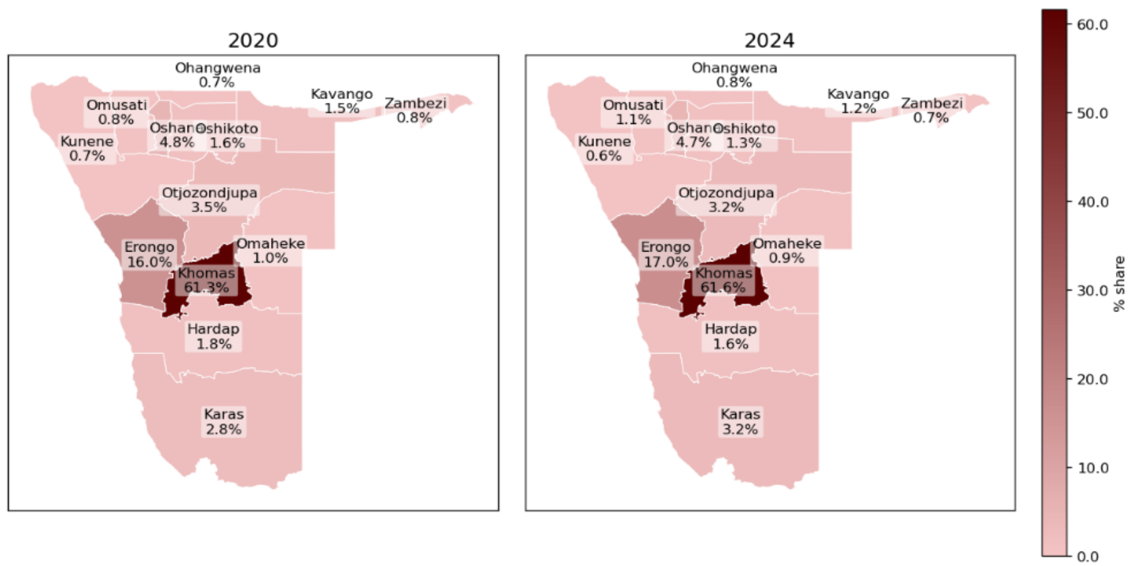
The age profile of households involved in cross-border digital services imports is dominated by the working age population (15 to 59 years), particularly the adult (25 to 59 years) and the youth (15 to 34 years), with a combined share of 68.7 percent. In 2020, adults accounted for 42.4 percent of total digital purchases, followed by youth at 30.4 percent and elderly users at 25.2 percent. By 2024, the adult share increased modestly to 44.6 percent, while the youth share declined to 22.9 percent. The elderly participation in digital trade has grown steadily, from 25.2 percent to 31.0 percent, suggesting greater comfort with digital payments and services such as software, cloud subscriptions, and online learning.

In contrast, children (less than 14 years) users remained marginal (below 1 percent), though small shares appeared in unlikely categories such as online dating and adult content. This likely reflects proxy or shared card usage; for example, cases where parents or guardians open bank accounts in their children's names but retain and use the cards for their own purchases, causing transactions to be recorded under younger age brackets. Additionally, misclassification of merchants, aggregation of payments through app stores, and family sharing of digital subscriptions may contribute to these anomalies rather than indicating genuine underage consumption.

Across service categories, video and music streaming continued to be the most widely used among adults and youth, together accounting for the majority of transactions in both years. Online gaming and gambling were also adult-driven segments, with over 55 percent of all transactions attributed to this group in 2024. Meanwhile, software and cloud services shifted notably toward older consumers; the elderly share increased from 42.9 to 53.1 percent; suggesting growing adoption of productivity and subscription-based platforms. Online learning and e-book services recorded a small decline among adults (from 53.6 to 51.3 percent) but expanded among elderly users (from 13.7 to 15.2 percent), reflecting more balanced uptake across age groups.

Overall, Namibia's digital trade landscape appears to be maturing, with adults remaining the largest participant group, while elderly consumers are rapidly catching up, supported by broader internet access, improved digital literacy, and greater familiarity with online payment systems.

Figure 10: Regional breakdown of digital services imports



The spatial distribution of Namibia’s cross-border digital service purchases remains highly concentrated in Khomas and Erongo regions, accounting for over 78 percent of all digital transactions in both 2020 and 2024 (Figure 10), reflecting strong urban bias in digital trade participation. Rural regions contributed marginally, reflecting ongoing gaps in internet access, financial inclusion, and digital infrastructure across the country.

Challenges of using card payments data

There are limitations with relying solely on credit and debit card information for measuring cross-border digital trade. One of the challenges associated with the estimation approach is to accurately categorize multi-service merchants that offers more than one business activity. Since MCCs are based on the entities core business activity, it becomes a challenge if the secondary activities are not registered separately which is the case for big merchants such as Apple and Microsoft for some of the digital services that are offered. To remedy this challenge, the merchant codes were used to classify merchants based on transaction type. Additionally, pricing information from various websites assisted in categorizing transactions with similar costs. For instance, Microsoft transactions worth of US$9.99 and US$6.99 were classified as computer software and cloud services, aligned with the known cost of standard Microsoft 365 subscriptions.

Secondly, distinguishing between residents and non-residents became a significant challenge when using card data from payments statistics as a source in balance of payments, especially given the complicated nature of residency status. This difficulty arises across multiple times as individuals who make card payments may change their residency status, such as expatriates who have moved abroad but continue to use their domestic bank accounts and cards. Moreover, this is aggravated by the fact that domestic products or services sold on international online e-commerce platforms are considered as sold internationally even if bought by a Namibian buyer from the platform (Bank of Namibia, 2024). Additionally, there are cases involving students who come to Namibia for full-time studies that make payments abroad using Namibian-issued cards. As per BPM6 methodology, such individuals remain residents of their home economies. This can lead to an overstatement of service imports and continues to be a major challenge faced by balance of payments compilers when using card data.

Moreover, accurately identifying cross-border digital transactions remains challenging due to the complex structures of digital intermediation platforms and payment gateways. These systems often obscure the true country of residence of either the buyer or the seller, as payments may be processed through intermediaries or foreign-linked bank accounts. For instance, platforms such as Airbnb, Booking.com, and Intercape may facilitate transactions that are domestic in nature, yet their payment routing mechanisms create the appearance of cross-border flows. Airbnb transactions, for example, are often channeled through Ireland, even when the accommodation is located elsewhere. Likewise, Intercape, a South African transport operator providing routes within Namibia, processes payments through South African bank accounts, causing purely domestic journeys to appear as international transactions in financial data.

Similarly, some Namibian e-tailers rely on ordering systems linked to foreign bank accounts, while products of domestic origin sold via international e-commerce platforms are classified as international sales, even when purchased by Namibian residents. These situations blur the distinction between resident-to-resident and cross-border transactions and, if left unadjusted, risk overstating cross-border digital trade and payment flows.

For balance of payments purposes, only the platform or booking fees are treated as imports of services if the underlying transactions involve resident parties. To address these challenges, platforms known to facilitate domestic transactions, as well as e-tailers or DIPs with foreign-linked ordering systems, adjusted downward relying on the fee structure and estimates of the possible resident transactions, thereby improving the accuracy of cross-border digital trade estimates. In the case of airlines, 80 percent of card transactions were classified as digital trade as most tickets are ordered digitally, while the remaining 20 percent were treated as card present (in person) transactions.

Another classification challenge arises from transactions involving travel agents and tour operators, particularly in distinguishing between transport services and travel services. Tour operators often provide all-inclusive travel packages that bundle multiple components—such as transport, accommodation, excursions, and insurance into a single transaction. The distinction in the balance of payments becomes complicated, making it difficult to allocate the appropriate value between passenger transport such as airfare or bus fare and travel services including accommodation and tour arrangements.

From a balance of payments perspective, this may lead to distortions in both the transport and travel subcomponents of the services account, particularly when foreign intermediaries facilitate domestic trips or when residents book packages abroad. To address this, information on the spending patterns of outbound travelers from the Namibia Tourism Satellite Account was used to adjust for the split in MCCs related to travel agents and tour operators[6]. The transactions from the travel agencies and tour operators MCC code were proportionally allocated between travel and transport services, guided by results from the satellite tourism account.

Lastly, the challenge of capturing purchases made through online chat platforms (e.g., WeChat, WhatsApp) remains a significant obstacle. Although orders for goods and services from abroad conducted through chat-based methods are not negligible, especially in the Namibian case, such purchases were excluded from the scope of this study due to the inherent ambiguity of

[6] Results from 2022 Namibia Tourism Satellite Account showed that outbound travelers spend about 23.5 percent on transport services with reminder spend on accommodation, food and beverages, cultural services etc.

chat-based transactions. Therefore, addressing this issue is an important future refinement on the way to comprehensively measure digital payments.

Conclusion

This paper presents experimental estimates of digital purchases of services from non-residents by Namibian households and businesses. The estimates are based on monthly credit and debit card data covering the period 2020 to 2024. Cross-border digital services imports have been on an upward trend, indicating the growing participation of Namibian households and businesses in global digital trade. These foreign card transactions are significant and are expected to be included in the Namibia's official BOP statistics by 2026. Card payment data is a good proxy to measure cross-border digital trade and should be explored by other countries that have access to such granular datasets. However, several challenges need to be addressed before the incorporation of these data in official BOP statistics.

Nonetheless, several caveats in drawing conclusions from this paper apply. First, the estimates only cover the card-based cross-border payments, whereas other channels such as wire transfers and mobile payments are excluded. The Handbook on Measuring Digital Trade recommends a multisource approach, that combines card data with household surveys, customs data, ITRS, and VAT data, to produce more comprehensive digital trade estimates. Therefore, future work could integrate ITRS data settled via wired transfers such as SWIFT with other data sources to produce comprehensive data on cross-border digital services and compile the template on digital trade.

Secondly, the study concentrated on outflows, representing imports of digital services by Namibian households and small and medium-sized enterprises. Further research could extend the coverage to exports of digital services, subject to the availability of similar granular datasets.

In summary, Namibia's experience demonstrates both the opportunities and the limitations of using card transaction data to measure digital trade. While not exhaustive, such data provide timely, high granularity, and policy-relevant insights that can enhance external sector statistics and strengthen alignment with forthcoming BPM7 standards.

Going forward, stronger collaboration amongst statistics producing agencies as well as the payment systems teams at central bank and experts from card processing entities such as VISA, Mastercard will be key to improving the quality and analytical use of card data. Collaborative engagement with other central banks regionally and internationally will also support the compilation of digital trade in accordance with the Handbook on Measuring Digital Trade and help produce robust, internationally comparable digital trade statistics that inform both fiscal policy and external-sector analysis

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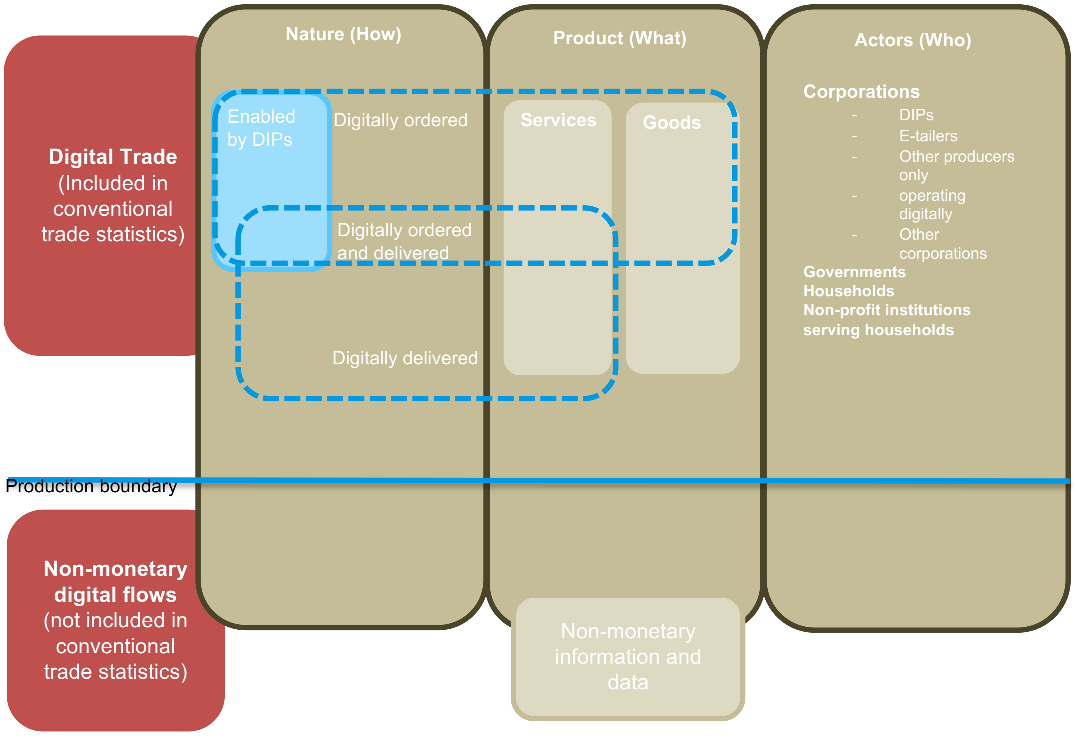
Annexure 1: A conceptual framework for digital trade

Figure 11: The conceptual framework for digital trade



Sources: IMF, OECD, UNCTAD and WTO, adapted from OECD, WTO, IMF (2023).