Hong Kong Travelers in Mainland China:

Scale, Destinations, and Expenditure Patterns *

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Abstract

This report presents evidence on the scale, destinations, and expenditure patterns of Hong Kong travelers in Mainland China. Official statistics indicate that the number of trips by Hong Kong residents to Mainland China, as well as their expenditures outside Hong Kong, have merely returned to pre-COVID levels. We then use aggregate statistics from AlipayHK for a more detailed investigation of consumption patterns. Our analysis reveals a growing integration of cross-border consumption markets, reflected in the increasing number of trips to Mainland China, a broader range of destinations, and a more balanced distribution of expenditures across Mainland cities. Furthermore, aggregate statistics from AlipayHK users highlight distinct differences in consumption patterns between Mainland China and Hong Kong. Notably, among AlipayHK users who have made transactions in Mainland China, services account for approximately half of total expenditures, whereas retail—which dominates spending in Hong Kong—represents only 26%. Using a simple model, we construct a relative competitiveness index from the perspective of Hong Kong residents. The results indicate that life services in Mainland China hold the greatest competitive advantage over Hong Kong, while Hong Kong remains more competitive in retail and the food and beverage sectors.

*We thank Tony Te KE and Matthew Ce SHI for helpful comments.

1 Introduction

Hong Kong's retail sector is experiencing a decline. Despite a notable recovery in 2023 following the end of COVID restrictions, the sector remains sluggish. Retail sales in 2023 increased by 14% compared to 2022, but they are still 16% below their 2018 level. Worse, the recovery quickly lost momentum, with retail sales dropping by 7% year-on-year in the first ten months of 2024. Tourists have historically been a vital source of retail demand in Hong Kong. However, despite showing signs of recovery, visitor arrivals remain underwhelming. As of October 2024, the total number of visitor arrivals accounted for only 56% of the figure recorded in 2018. *The Economist* lists weak retail sales as one of the two difficulties facing Hong Kong's real economy.[1]

To some, this marks the beginning of the end of the sector. From the perspective of an integrated market, retail in Mainland China not only offers lower prices but is also constantly strengthening their competitiveness through large investments, fast learning, and continuous innovation.[2] Moreover, connectivity between Hong Kong and Mainland China has been greatly improved by new infrastructure, such as the high-speed railway, additional control points, as well as government policies and private-sector initiatives aimed at reducing barriers in the Greater Bay Area. "Hong Kong residents increasingly go to the nearby city of Shenzhen for shopping, reversing an old trend," as the same article in *The Economist* argues. Indeed, about 6.5 million trips have been made by Hong Kong residents every month in 2024, diverting billions of HKD in consumption demand away from Hong Kong. The future of Hong Kong's consumer services appears bleak, seemingly a necessary trade-off as Hong Kong reaps larger benefits from full economic integration with Mainland China.

This report presents two sets of evidence to contest the prevailing pessimistic view. Our first data source is the official statistics released by the Hong Kong government's Census and Statistics Department and Immigration Department, offering direct evidence on the scale of Hong Kong travelers and their spending. An immediate observation is that Hong Kong residents are merely reverting to their pre-pandemic travel and consumption patterns. Before the pandemic, trips to Mainland China accounted for 80% of the average Hong Kong resident's outbound trips, with approximately 9% of their budget allocated to expenditures outside of Hong Kong. While these ratios plummeted during the pandemic, they have been recovering since the first quarter of 2023 and have recently reached levels comparable to the pre-pandemic period. To conclude, the comprehensive official statistics show a clear, albeit somewhat unremarkable, mean-reversion process. This finding directly contradicts the grim predictions about Hong Kong's retail sector, which have largely been based on anecdotal claims of Hong Kongers' spending sprees abroad, rather than any comprehensive evidence.

The next question is how much the average Hong Konger spends on each trip to Mainland China. A frequently cited figure in various newspapers and social media can be traced back to the consumption expenditure of Hong Kong residents per Mainland trip in 2014, a statistic released by the Census

[1] "Stability, now what?", *The Economist*, September 14th-20th, 2024.

[2] Chen et al. (2023) documented rapid capital deepening and fast productivity growth in China's consumer services. The literature also highlights the significant impact of E-Commerce platforms, which remain underdeveloped in Hong Kong, on transforming consumer services in China.

and Statistics Department but not updated since. In 2014, the average expenditure per person-trip for Hong Kong residents traveling to Mainland China for personal reasons was recorded at HK$860.[3] We extrapolate this data to 2019, assuming that per-Mainland trip expenditure in a given year is proportional to the expenditure outside Hong Kong per outbound trip. The inferred expenditure per trip in 2019 is around HK$1,000 for Mainland destinations and therefore HK$5,500 for non-Mainland destinations. If we further assume a stationary composition of expenditure for Mainland and non-Mainland trips one year before and after the pandemic – an assumption that aligns well with the constant composition of Mainland and non-Mainland trips – the average Hong Konger would still spend around HK$1000 for each Mainland trip, neither more nor less than their pre-COVID spending.[4]

Our second data source comprises the statistics compiled from AlipayHK users. Notwithstanding the typical limitations on representativeness, this sample allows us to conduct external validity checks on the official statistics. Simple aggregation depicts an equally gloomy outlook for consumer services in Hong Kong. Consumption expenditure of all AlipayHK users in Mainland China rises 57-fold within 16 months.[5] However, a closer examination reveals a similar pattern to the official data. The increase in consumption expenditure is mainly driven by the rise in the number of active days, a variable constructed to capture visits to the Mainland, rather than by increased expenditure per active day.[6] Moreover, we find that the average consumption expenditure per active day in Mainland China has stabilized around HK$ 500 since 2023Q3. Since this figure almost surely underestimates the spending per Mainland trip, the discrepancy is qualitatively correct and its magnitude also appears to be within a reasonable range of the bias.[7]

The AlipayHK aggregated data also reports the number of distinct prefecture-level cities where AlipayHK users conducted transactions per active day in Mainland China. The average number of distinct cities per active day increased from 1.07 in January 2023 to 1.15 in May 2024. This broader range of destinations is associated with a decrease in spatial expenditure concentration: the Herfindahl-Hirschman Index (HHI) of city-level expenditures declined both across all Mainland cities and within the Greater Bay Area. This suggests that Hong Kong travelers are benefiting from accessing a greater variety of goods and services offered across different Mainland cities.

The AlipayHK aggregated data also provides valuable insights into expenditure patterns that may not be fully captured by official statistics. We find that AlipayHK users who have had transactions in Mainland China exhibit different cross-border expenditure patterns. Two categories (Food and Beverages, Retail) account for 86% of AlipayHK users' expenditure in Hong Kong, but only 42%

[3] Source: Hong Kong Monthly Digest of Statistics in November 2015, CSD.

[4] All expenditures from CSD are in real term (2022 HK$).

[5] Specifically, we identify cross-border consumption expenditure by "Hong Kong-Mainland Cross-border Payment", through which AlipayHK users can make payment for offline transactions in Mainland China.

[6] We define an active day for an AlipayHK user in Mainland China as a day on which the user makes at least one payment through "Hong Kong-Mainland Cross-border Payment".

[7] There are two main reasons for underestimation. First, each trip contains at least one day, and it is challenging to identify the duration of a Mainland-bound trip in the AlipayHK aggregated data. Second, AlipayHK users may use other payment methods, for which we have no data.

in Mainland China. Conversely, services (in particular life services) represent 49% (40%) of the expenditure in Mainland China, compared to just 12% (3%) in Hong Kong.[8] Moreover, the increasingly even spatial distribution of expenditures across Mainland cities is entirely driven by spending on services rather than retail. At the same time, the expenditure portfolio in Hong Kong has remained largely unchanged since the lifting of COVID restrictions. This stark contrast challenges the common concern that Hong Kongers are traveling to Mainland China for cheaper goods, hollowing out Hong Kong's retail sector. Instead, the available data does not provide compelling evidence that goods in Mainland China are direct substitutes for consumption in Hong Kong.

AlipayHK is only one of several major digital payment platforms. To understand potential bias of this sample, we build a simple model where consumers choose between different payment methods to purchase various goods and services across different locations. We show that, if consumers' preferences over payment methods, varieties, and locations are idiosyncratic and Frechet distributed, the across-border expenditure patterns revealed by the AlipayHK aggregated data can be structurally interpreted. The ratio of expenditure in category in Mainland China to the same category in Hong Kong, adjusted by an externally calibrated scalar, is a summary statistic of the category's competitiveness in Mainland China relative to Hong Kong, from the perspective of Hong Kong residents. For instance, the high expenditure share in life services in Mainland China indicates that these services are significantly more competitive than those in Hong Kong. Hong Kong has the highest level of advantage in Retail of clothing, Jewelleries, and educational services.

2 Scale of Hong Kong Travelers in Mainland China

This section employs both official data and AlipayHK transaction records to address two frequently asked questions: How often do Hongkongers travel to Mainland China, and how much do they spend during their visits?

2.1 Official Data

To facilitate the presentation of the facts, we introduce the following notations. Let N_t denote the number of Hong Kong residents' out-bound trips. N_t can be decomposed as $N_t = \sum_l N_{lt}$, where $l \in \{M, R\}$ represent the trip destination, with M, R denoting Mainland China and rest of the world. Let E_t denote the total consumption expenditure of Hong Kong residents at period t, and E_t can also be decomposed as $E_t = \sum_l E_{lt}$, where $l \in \{H, M, R\}$ represents the location of consumption, with H denoting Hong Kong.

We use "Daily Passenger Traffic" released by the Immigration Department to compile the quarterly N_t and N_{Mt}.[9] The solid and dotted line in Figure 1 plots the share and number of Mainland

[8] Life services include personal services such as beauty and health, bill payment services for water, electricity, and gas, as well as other services like laundry, cleaning, and garment care.

[9] The outbound trips through the following seven control points are defined as "Mainland-bound": Express Rail Link West Kowloon, Hong Kong-Zhuhai-Macao Bridge, Lo Wu, Lok Ma Chau, Lok Ma Chau Spur Line, Man Kam To,

trips ($\frac{N_{Mt}}{N_t}$ and N_{Mt}), respectively. Before the pandemic, the share was approximately 80%, but it dropped drastically to just 11% in 2022Q4. The removal of COVID policies led to an immediate and complete recovery: the share rebounded to its pre-pandemic level and has remained highly stable since then. The number of trips follows a similar pattern, with both indicators illustrating that Hong Kong residents have simply resumed their pre-pandemic travel behavior.

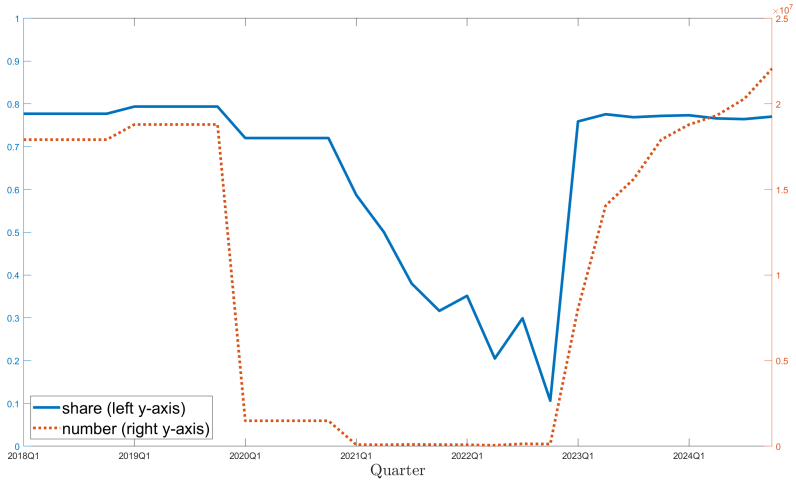

Figure 1: Trips to Mainland China

Note: This figure plots the share of Mainland-bound trips of Hong Kong residents in their total outbound trips (solid line, left y-axis) and the number of Mainland-bound trips (dotted line, right y-axis). Data source: The Immigration Department of the Hong Kong government.

On the expenditure side, the Census and Statistics Department (CSD henceforth) categorizes E_t into two components: consumption expenditure within Hong Kong (E_{Ht}) and outside ($E_{Mt} + E_{Rt}$). The solid line in left panel of Figure 2 plots the quarterly proportion of the expenditure outside Hong Kong, $\frac{E_{Mt}+E_{Rt}}{E_t}$, from 2018Q1 onwards. While we cannot distinguish the expenditure in Mainland China E_{Mt} from $E_{Mt} + E_{Rt}$, the patterns before and after the pandemic in Figure 2 are remarkably similar to those in Figure 1. The share fluctuated slighltly around 9% before the pandemic. While it plummeted to less than 2% during the pandemic, the share has been steadily increasing since 2023Q1 and has recently reached a level comparable to the pre-pandemic period. The dotted line (the right y-axis) plots the level of the expenditure outside Hong Kong in real term, $E_{Mt} + E_{Rt}$, which has also returned to the 2019 level in the recent quarters.

and Shenzhen Bay. Prior to 2021, the Immigration Department only published annual statistics on outbound trips. To estimate quarterly data for these years, we divided the annual figures by four.

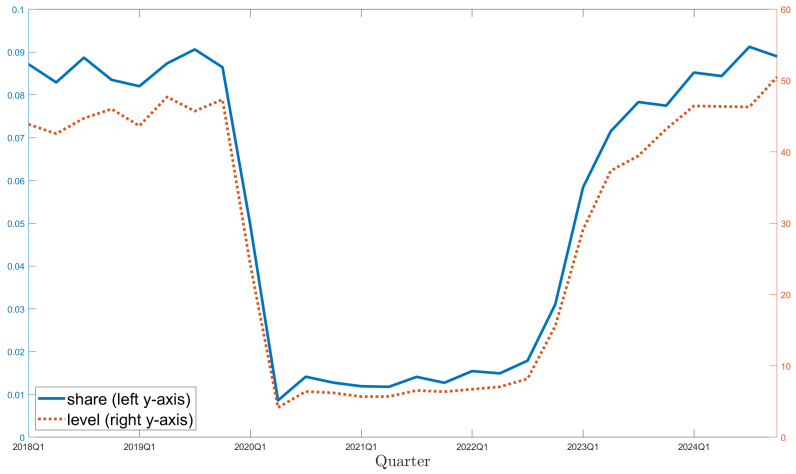

Figure 2: Consumption outside Hong Kong

Note: This figure plots the share of consumer expenditure of Hong Kong residents outside Hong Kong (solid line, left y-axis) and its level in real term (dotted line, right y-axis, unit: billion 2022 HK$). Data source: The Census and Statistics Department of the Hong Kong government.

The close comovement between $E_{Mt} + E_{Rt}$ and N_t also reveals a stable expenditure per trip, $\frac{E_{Mt}+E_{Rt}}{N_t}$, before and after the pandemic, as illustrated in the left panel of Figure 3. The only exception is a spike in 2023Q1, immediately following the lifting of COVID restrictions. However, the consumption boom outside Hong Kong quickly subsided. The average expenditure per trip after 2023Q1 is nearly identical to that in 2018-19 in real term.

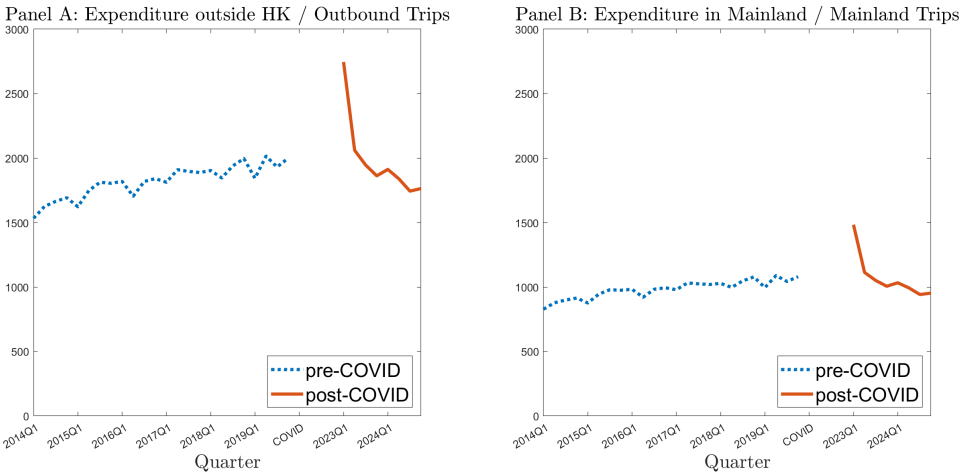

Figure 3: Per-Trip Expenditure (2022 HK$)

Note: The left panel plots the total expenditure of Hong Kong residents outside Hong Kong ($E_{Mt} + E_{Rt}$) divided by the number of out-bound trips ($N_{Mt} + N_{Rt}$). See Figure 2 and 1 for data sources. The right panel plots the expenditure in Mainland China per Mainland-bound trips inferred from equation (1). The dotted and solid lines represent the pre- and post-COVID period, respectively. All the expenditures are in real term (2022 HK$).

No official data directly distinguishes between E_{Mt} and E_{Rt}. Various newspapers and social media refer to an estimate of HK$4 billion for Hong Kongers' consumption expenditure in Shenzhen in July 2023.[10] This figure was derived by multiplying the 2014 per-trip consumption expenditure of Hong Kong resident in Mainland (last released by the Census and Statistics Department) by the number of trips to Shenzhen in July 2023. However, given that Hong Kong's total expenditure outside Hong Kong increased by 11% from 2014 to 2023, using the 2014 per trip-expenditure likely underestimates E_{Mt} for 2023.

We estimate E_{Mt} by assuming a constant ratio of expenditure per Mainland trip to non-Mainland trip ($\frac{E_{Mt}/N_{Mt}}{E_{Rt}/N_{Rt}}$). This implies a time-invariant share θ of expenditure per Mainland trip in the per-trip expenditure – i.e., $\frac{E_{Mt}/N_{Mt}}{(E_{Mt}+E_{Rt})/N_t} = \theta$. Under this assumption, the stable expenditure per trip before and one year after the pandemic would predict a constant $\frac{E_{Mt}}{N_{Mt}}$. The Immigration Department categorizes outbound trips by control points.[11] The share of Mainland trips collapsed in the pandemic, rebounded to 76% in 2023Q1, and has since stabilized around this level, which is, once again, comparable to the pre-COVID share (see Figure 1). The assumption of time-invariant $\frac{E_{Mt}/N_{Mt}}{(E_{Mt}+E_{Rt})/N_t}$ is at least consistent with the stable composition of outbound trips.

We can now extrapolate $\frac{E_{Mt}}{N_{Mt}}$ by

$$\frac{E_{Mt}}{N_{Mt}} = \theta \times \frac{E_{Mt} + E_{Rt}}{N_t} \tag{1}$$

where $t \in \{2015Q1, \cdots, 2019Q4, 2023Q1, \cdots, 2024Q4\}$ and $\theta = 0.54$ is calibrated by the 2014 data. The right panel of Figure 3 plots $\frac{E_{Mt}}{N_{Mt}}$ inferred from (1). The average Hong Konger would spend around one thousand HK dollars per Mainland trip in 2024, almost identical to their pre-COVID spending levels.

2.2 AlipayHK aggregated data

We next compile statistics from AlipayHK aggregated data to conduct external validity checks for the reliability of E_{Mt} and $\frac{E_{Mt}}{N_{Mt}}$ inferred from the official statistics. We use superscript A to denote the expenditure paid through AlipayHK. Subscript i and j refer to type-i AlipayHK users and consumption category j, respectively. Our most granular data is E^A_{ijlt}, the expenditure on consumption category j of type-i users paid through AlipayHK in location l, where $l \in \{H, M\}$ refers to the offline expenditure in Hong Kong and Mainland China, respectively.In this subsection, we will compile $E^A_{lt} \equiv \sum_{i,j} E^A_{ijlt}$, the total offline expenditure in location l.

According to AlipayHK aggregated data, the total expenditure in Mainland China increases by 57 times from January 2023 to May 2024. Converting to quarterly data, this represents a 15-fold

[10] See, e.g., Nanfang Metropolis Daily https://news.southcn.com/node_54a44f01a2/a37d10c11e.shtml, The Academy of Chinese Studies in Hong Kong https://www.ourchinastory.com/cn/7065.

[11] We define Mainland-bound trips by those through the Hong Kong-Zhuhai-Macao Bridge, Express Rail Link West Kowloon, and control points adjacent to Shenzhen.

increase from 2023Q1 to 2024Q1, 9 times greater than the increase in $E_{Mt} + E_{Rt}$ reported in the official data. The total expenditure in Hong Kong (E^A_{Ht}) remains relatively stable.

The much fast increase of E^A_{Mt} may be driven by the rapid increase in the number of AlipayHK users. To mitigate the effect, we focus on incumbent seasoned AlipayHK users who have actively used AlipayHK since 2022. [12] Their total expenditure through AlipayHK in Hong Kong and Mainland China is denoted by E^A_{sHt} and E^A_{sMt}, where $i = s$ represents the seasoned users. And we find that the increase in E^A_{sMt} is still dramatic, representing a 13.5-fold increase from 2023Q1 to 2024Q1.

We have shown that the increase in E_{Mt} is, by and large, driven by the increase in the number of Mainland-bound trips. As a result, today's expenditure per Mainland trip is almost identical to the pre-pandemic level of HK$ 1,000. Using the AlipayHK aggregated data, we compile the number of AlipayHK users' active days in Mainland China since January 2023, denoted by D^A_{Mt}. Figure 4 plots the numbers since January 2023, with D^A_{Mt} normalized to unity for January 2023. The number of active days in Mainland (D^A_{Mt}) increases by more than 30 times. Converting to quarterly data, D^A_{Mt} represents a 9.7-fold increase from 2023Q1 to 2024Q1, 4 times greater than the increase in $N_{Mt}+N_{Rt}$ reported in the official data.

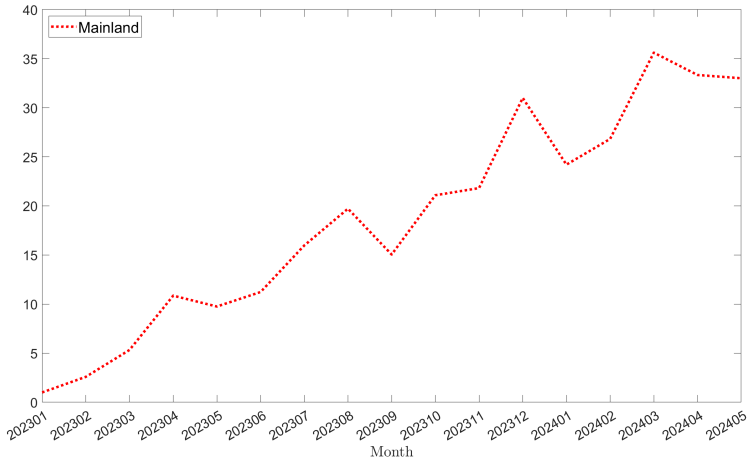

Figure 4: Growth of active Days on AlipayHK

Note: The dotted line plots the number of total active days in Mainland China relative to its level in January 2023 (normalized to unity).

We next calculate the expenditure per active day in Mainland China, $\frac{E^A_{Mt}}{D^A_{Mt}}$. Figure 5 plots the results. The dynamics of $\frac{E^A_{Mt}}{D^A_{Mt}}$ do not exactly follow $\frac{E_{Mt}}{N_{Mt}}$ inferred from the official statistics in Panel B of Figure 3. In particular, $\frac{E^A_{Mt}}{D^A_{Mt}}$ of AlipayHK users continued to grow in the first three quarters of 2023, while $\frac{E_{Mt}}{N_{Mt}}$ has been stable since 2023Q2. The expansion of AlipayHK's market share in Mainland might explain the difference. Notable, even $\frac{E^A_{Mt}}{D^A_{Mt}}$ has been stabilizing about HK$ 500 since

[12] We define seasoned users, specifically active users, as individuals who registered through AlipayHK and successfully completed at least one transaction within the year 2022.

2023Q4. This average expenditure is only half of the average expenditure per Mainland trip inferred from the official data. However, the discrepancy is qualitatively correct because the former figure almost surely underestimates the spending per Mainland trip (each trip contains at least one day and AlipayHK users may use other payment methods). The magnitude of the discrepancy also appears to be within a reasonable range of the bias.

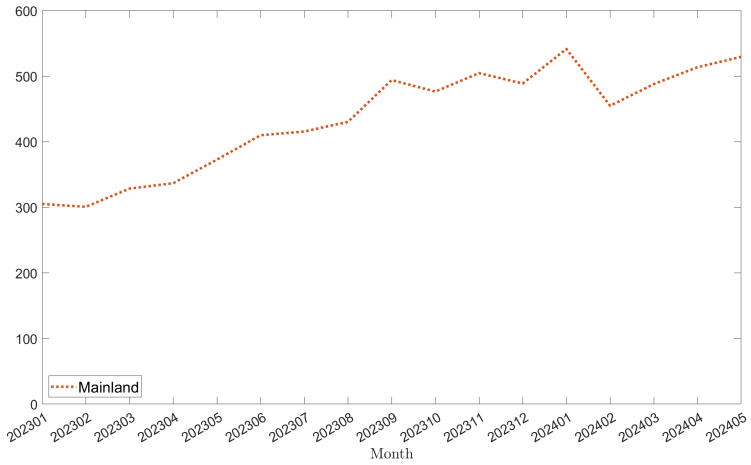

Figure 5: Expenditure per Active Day on AlipayHK

Note: This figure plots the expenditure per active day of Mainland China since January 2023. Unit: HK$

3 Destinations and Consumption Patterns of Hong Kong Travelers in Mainland China

3.1 Destinations

One key advantage of the AlipayHK aggregated data is its ability to identify the location of each transaction down to the prefecture-level city, which we refer to as the "transaction city." Let E^A_{ct} denote the total expenditure paid through AlipayHK in city c. Figure 6 illustrates the city-level expenditure shares, $\frac{E^A_{ct}}{\sum_c E^A_{ct}}$. Panel A shows that AlipayHK transactions already covered almost every city in 2023Q1, with the exception of those in western China. This coverage expanded further, encompassing nearly all cities by 2024Q1 (Panel B).

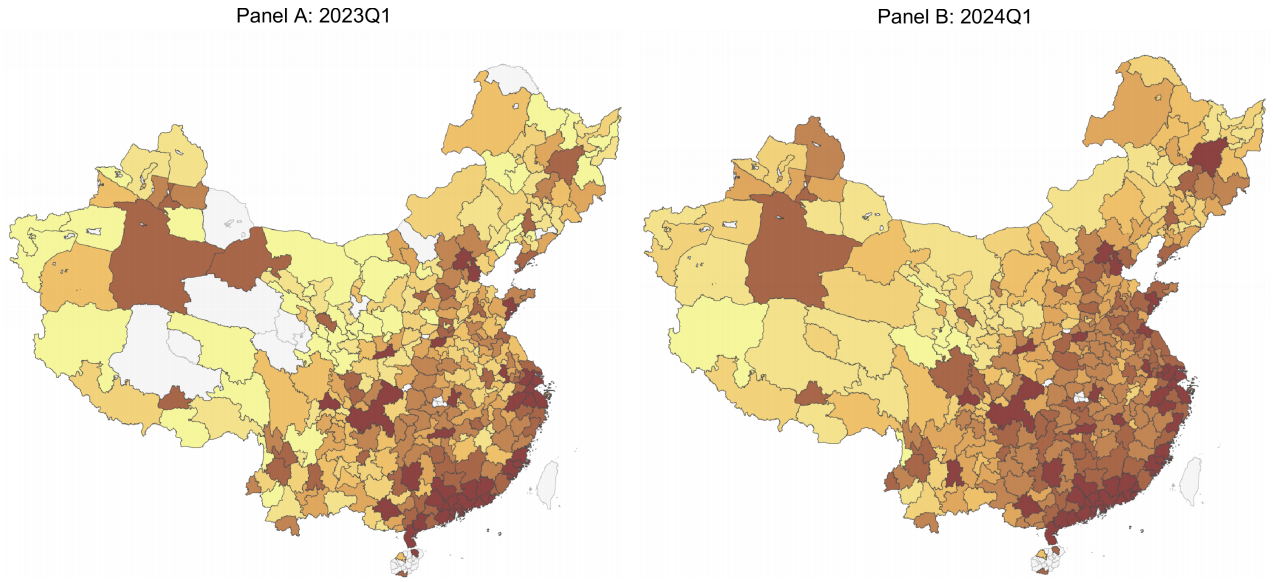

Figure 6: Spatial Distribution of Expenditure in Mainland China

Note: This figure shows the geographic distribution of expenditures using AlipayHK aggregated data. The left panel displays city-level expenditure shares of total Mainland consumption in 2023Q1, equally divided into eight groups based on percentiles. Darker shades indicate higher expenditure shares. The right panel illustrates the distribution for 2024Q1 using the same group division rules as in 2023Q1. Blank cities indicate that no transaction recorded for that period. To avoid confusion, we exclude cities in Taiwan and the South China Sea, which the mainland part of AlipayHK aggregated data does not cover.

The AlipayHK aggregated data also provides valuable insights into the concept of 'one trip with multiple destinations,' a theme frequently highlighted in various official reports and news articles.[13] While AlipayHK transaction records are insufficient to identify every Mainland trip, we can calculate the average number of distinct transaction cities per active day in Mainland China. This serves as a lower-bound estimate of the number of destination cities per trip, as it splits trips spanning multiple days into separate active days. Figure 7 shows that the average number of distinct transaction cities per active day in Mainland China increased from 1.07 cities in January 2023 to 1.15 cities in May 2024.[14] It is important to emphasize the lower-bound nature of this estimate. The actual number of destination cities per Mainland trip is likely even higher.

[13]See, for example, the Hong Kong Tourism Board (HKTB) https://www.discoverhongkong.com/tc/about-hktb/annual-report/annual-report-20182019/multi-destination-travel/ and Wen Wei Po https://www.wenweipo.com/a/202303/15/AP6410dc60e4b0b6003c017c41.html.

[14]This increase may partially reflect the impact of new infrastructure developments that have reduced cross-border consumption barriers, such as the high-speed railway, additional control points, as well as government policies and private-sector initiatives aimed at facilitating mobility within the Greater Bay Area.

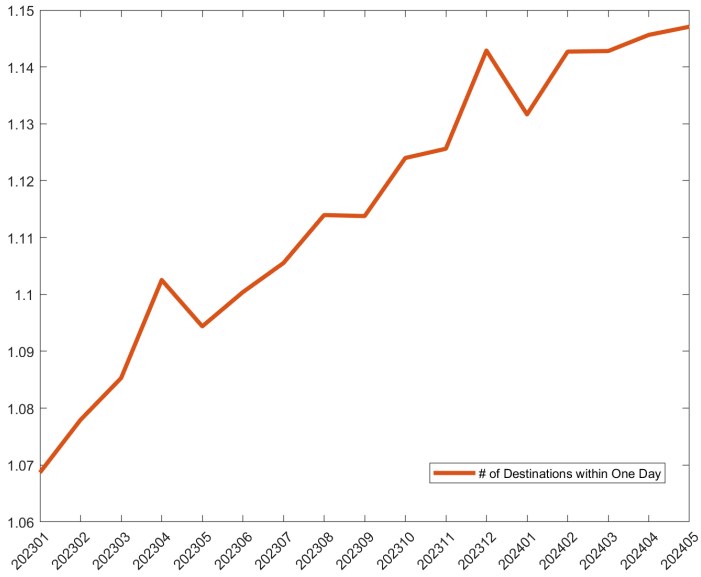

Figure 7: Average Distinct Transaction Cities in Mainland

Note: This figure illustrates the average count of unique transaction cities per day in Mainland for consumers with cross-border spending records starting from January 2023 using AlipayHK aggregated data.

3.2 Cross-Border Consumption Patterns

How do consumption patterns differ across borders? The left panel of Figure 8 compares the expenditure shares across four major categories in Hong Kong and Mainland. This analysis focuses exclusively on AlipayHK users with cross-border spending records, allowing us to compare their spending patterns in Hong Kong and Mainland China. In Hong Kong, AlipayHK users spend the most on retail, followed by food and beverage, with services ranked third. However, in Mainland, the majority of spending of these AlipayHK users is on services, which alone account for 49% of the total their spending in Mainland. This challenges the conventional belief that Hong Kong consumers primarily visit the Mainland for cheaper food and retail shopping, suggesting instead that services are the main draw for their spending.

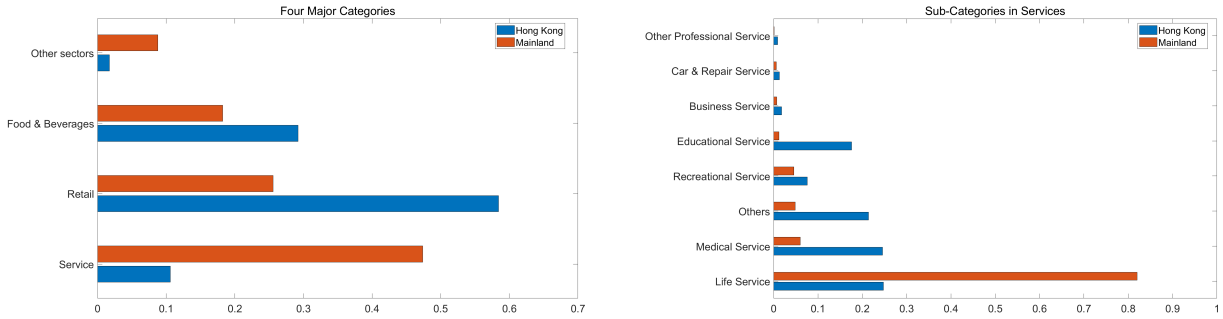

Figure 8: Heterogeneous Consumption Patterns across Borders

Note: The left panel plots the expenditure shares of consumption in Mainland and Hong Kong across four major spending categories (retail, food and beverage, services, and others) in the AlipayHK aggregated data. The right panel plots the expenditure shares in Mainland and Hong Kong across sub-categories within services. The sub-categories include life services, medical services, educational services, recreational services, car and repair services, business services, professional services n.e.c, and other services. All expenditure shares are calculated using data from January to May, 2024.

What services in Mainland attract such a large share of spending? The right panel of Figure 8 breaks down service-related spending in Mainland China and Hong Kong into sub-categories. We find that life services account for approximately 80% of total service spending in Mainland, encompassing expenditures on daily services such as cleaning, personal care, beauty, and bill payments. Following life services, consumers spend around 5% on medical and recreational services. This, again, contrasts with the spending patterns in Hong Kong, where consumers allocate only about 25% of their service-related spending to life services, with a similar proportion going toward medical services. Moreover, consumption patterns in Hong Kong are barely affected by the lifting of COVID restrictions. Panel A of Figure 9 shows some marginal adjustments in the composition of expenditure in Hong Kong before and after the pandemic. Higher shares in services, food and beverage are consistent with the post-COVID recovery of the industries requiring in-person contact. It is worth mentioning that the surge in spending on services in Mainland China might crowd out similar expenditures in Hong Kong due to cross-border substitutability. However, the higher post-pandemic share of service spending in Hong Kong contradicts this concern. Furthermore, Panel B reveals a remarkably stable composition of service expenditures within Hong Kong after the pandemic. In short, there is no clear evidence showing that goods and services in Mainland China serve as substitutes for consumption in Hong Kong.

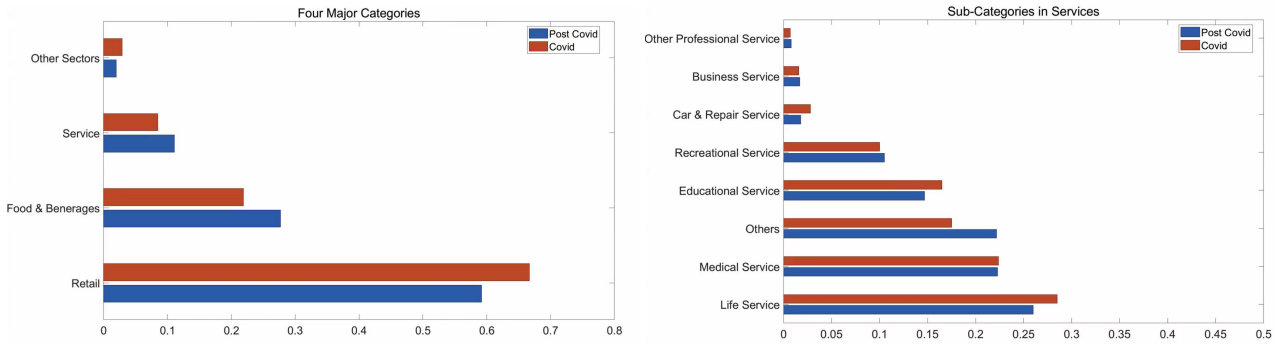

Figure 9: Expenditure Shares before and after the pandemic

Note: The figure plots the expenditure shares of AlipayHK users in Hong Kong before and after the pandemic. The left panel plots the expenditure shares of four major categories of AlipayHK users in Hong Kong. The right panel plots the expenditure shares across sub-categories within services.

3.3 Spatial Consumption Patterns

We now examine the consumption patterns of Hong Kong residents across Mainland cities. Figure 6 illustrates that while the majority of AlipayHK expenditures remain concentrated in developed regions, such as the Greater Bay Area, Beijing, and Shanghai, the expenditure shares in lower-tier cities have grown over time. This more balanced spatial distribution of expenditures indicates a higher level of integration within the consumption market.

To measure changes in the spatial concentration of expenditures, we calculate the Herfindahl-Hirschman Index (HHI) for city-level expenditures, E^A_{ct}. The results are presented in Figure 10. The HHI for all Mainland cities decreases by 20%, falling from 0.38 in 2023Q2 to 0.30 in 2024Q2. The HHI for the Greater Bay also declines, although the reduction is less pronounced.

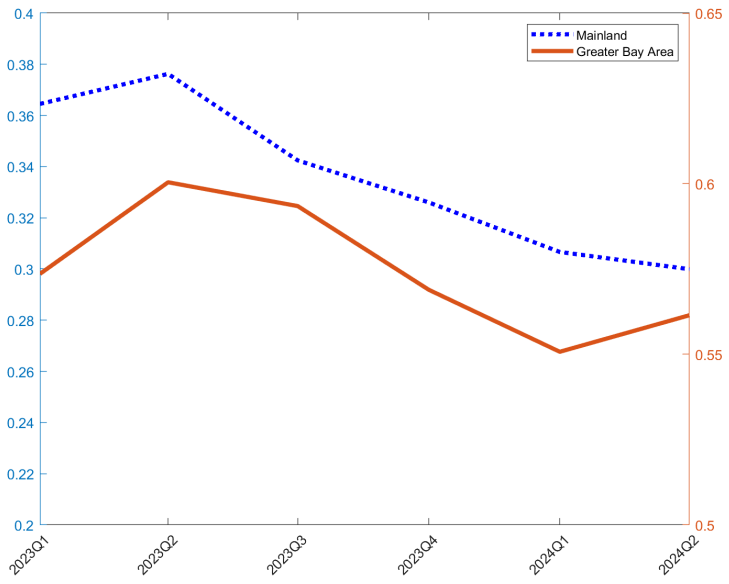

Figure 10: Quarterly HHI in Mainland

Note: This figure shows the quarterly HHI of city-level expenditures in Mainland using AlipayHK aggregated data. The dotted line illustrates the quarterly trend of HHI in Mainland, while the solid line shows the HHI within Mainland cities in the Greater Bay Area. Specifically, the Mainland cities in the Greater Bay Area include Dongguan, Foshan, Guangzhou, Huizhou, Jiangmen, Shenzhen, Zhongshan, Zhaoqing, and Zhuhai.

The two largest categories, retail and services, together account for over 70% of AlipayHK expenditures in Mainland China (see Figure 8). Gao et al. (2025) find that the decline in spatial concentration is entirely driven by services. Figure 11 summarizes their main findings: while the concentration of retail spending remains stable or slightly increases for both all Mainland cities and the Greater Bay Area, the concentration of service spending shows a much more significant decline in both cases.

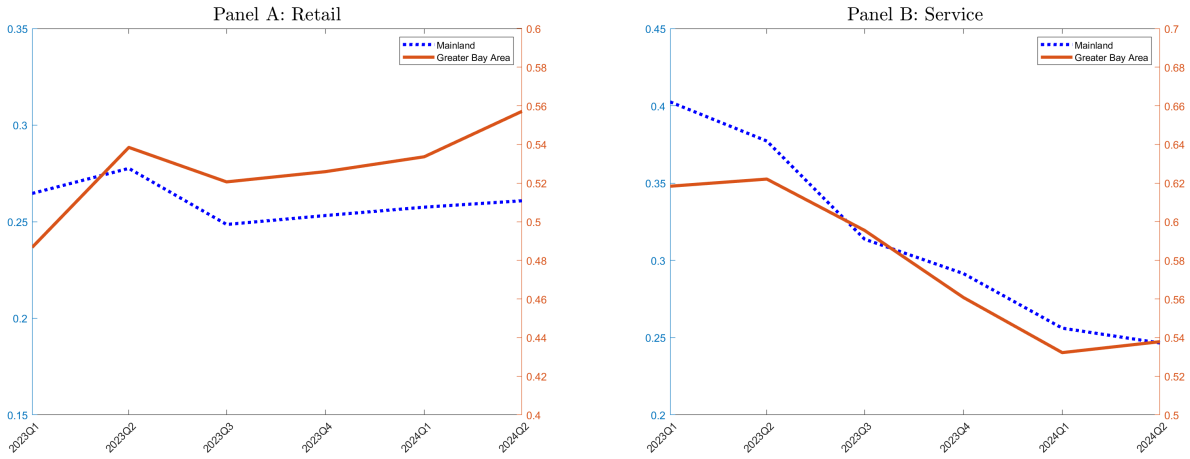

Figure 11: Quarterly HHI in Mainland by Spending Category

Note: This figure shows the quarterly HHI of city-level expenditures in Mainland using AlipayHK aggregated data for two spending category, with retail in the left panel and services in the right panel. The dotted line illustrates the quarterly trend of HHI in Mainland, while the solid line shows the HHI within Mainland cities in the Greater Bay Area. Specifically, the Mainland cities in the Greater Bay Area include Dongguan, Foshan, Guangzhou, Huizhou, Jiangmen, Shenzhen, Zhongshan, Zhaoqing, and Zhuhai.

Figures 12 and 13 offer a visual comparison of city-level expenditure shares across the two main categories over time (Gao et al., 2025). While both figures indicate that spending remains concentrated in the most developed regions, the widespread increase in expenditure shares from 2023Q1 to 2024Q1 in lower-tier cities is observed only in service spending. This contrast suggests that the more evenly distributed expenditures across Mainland cities is primarily driven by the growth of service spending in lower-tier cities.

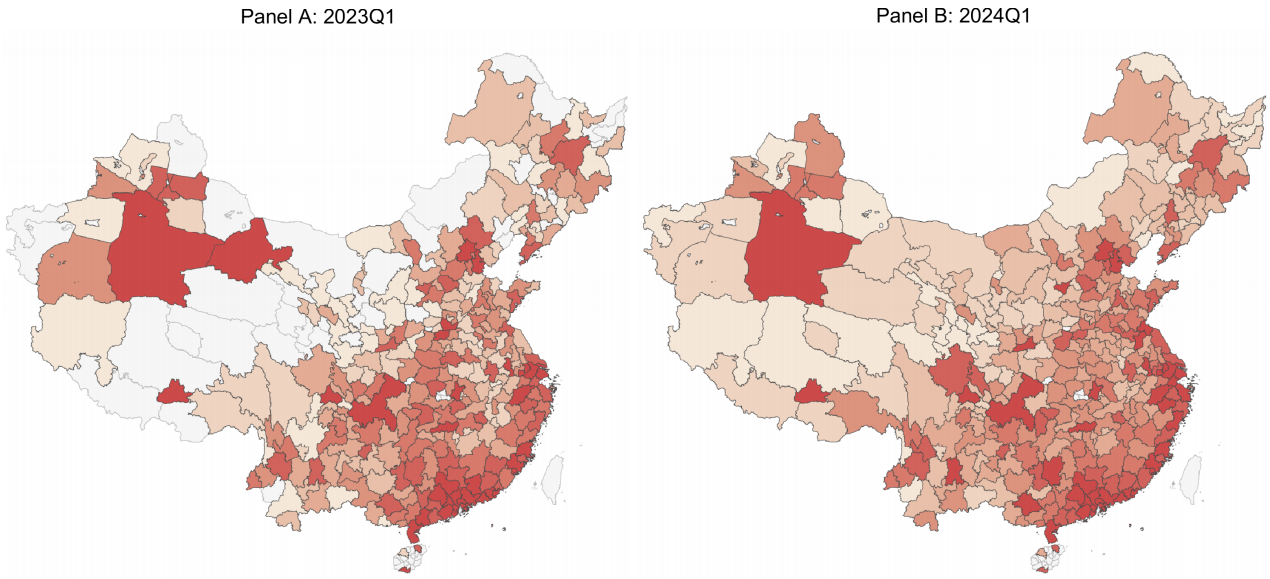

Figure 12: Spatial Distribution of Retail Expenditure in Mainland China

Note: This figure shows the geographic distribution of retail expenditures using AlipayHK aggregated data. The left and right panel display the city-level retail expenditure shares in 2023Q1 and 2024Q1, respectively. Refer to the note for Figure 6 for additional details on specifications.

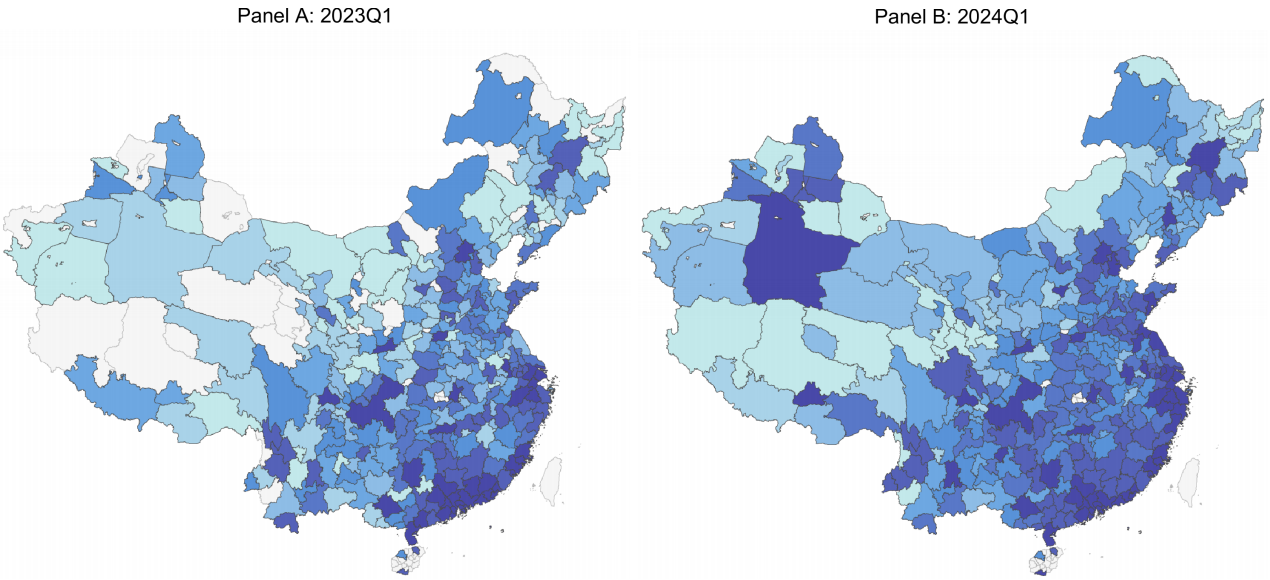

Figure 13: Spatial Distribution of Service Expenditure in Mainland China

Note: This figure shows the geographic distribution of service expenditures using AlipayHK aggregated data. The left and right panel display the city-level service expenditure shares in 2023Q1 and 2024Q1, respectively. Refer to the note for Figure 6 for additional details on specifications.

4 Relative Competitiveness

This section introduces a simple model to demonstrate how the Mainland expenditure share in a given category serves as a summary statistic for the competitiveness of goods and services in Mainland China relative to Hong Kong. Within this model, the variable 'competitiveness' is derived from the model's assumptions and observed data. It represents the effective price of consumption goods or services, providing a quantitative measure of their relative attractiveness. The model also helps to illustrate how the results are affected by potential biases in the AlipayHK aggregated data, as it is just one of several major digital payment platforms. We show that if consumers' preferences over payment methods, categories, and locations are idiosyncratic and Frechet distributed, the AlipayHK sample will uniformly shift the summary statistic without affecting rankings or economic interpretations.

Following Burstein et al. (2024), we assume each individual i derives utility from shopping a continuum of variety indexed by $z \in [0,1]$. For each variety, individual chooses whether to shop locally ($l = H$), across the border in Mainland ($l = M$), or from the rest of the world ($l = R$), within a particular spending category j, and using payment methods either AlipayHK ($k = A$), or other payment vehicles ($k = O$).

Utility of individual i is given by

$$U_i = \int_0^1 \left[\sum_j \sum_{l=H,M,R} \sum_{k=A,O} a_{ijl}^k \varepsilon_{ijl}^k (z)\, c_{ijl}^k (z) \right]^{\frac{\rho-1}{\rho}} dz.$$

Here, c_{ijl}^k denotes the quantity of goods purchased in location l from category j via payment method k. a_{ijl}^k represents the tastes of individual i over consumption goods in location l from category j via payment method k whereas $\varepsilon_{ijl}^k (z)$ represents the idiosyncratic tastes across variety z. ρ captures the substitutability of consumption across categories, locations, and payment methods.

The budget constraint of individual i is:

$$I_i = \sum_j \sum_{l=H,M,R} p_{jl} \sum_{k=A,O} \int_0^1 c_{ijl}^k (z)\, dz.$$

Here, p_{jl} denotes the price of goods purchased in location l from category j. Following Burstein et al. (2024), we assume $\varepsilon_{ijl}^k (z)$ is Frechet distributed, $G(\varepsilon) = exp\left(-\varepsilon^{-\theta}\right)$ with $\theta > \rho - 1$. Both ρ and θ are inconsequential to our results.

We first establish the expenditure share

$$\pi_{ijl}^k = \frac{\left(a_{ijl}^k / p_{jl}\right)^\theta}{\sum_j \sum_{l=H,M,R} \sum_{k=A,O} \left(a_{ijl}^k / p_{jl}\right)^\theta} \tag{2}$$

where $\left(a_{ijl}^k / p_{jl}\right)^\theta$ directly reflects the effective price in location l from each category j via payment method k, which serves as our measure of competitiveness and the attractiveness of consumption goods.

To isolate the effects of payment method, we assume $a_{ijl}^k = a_{ijl} \times a_{il}^k$, where a_{ijl} is a demand shifter for category j in location l and a_{il}^k captures the convenience of individual i using payment method k in location l. While a_{il}^k may vary across payment method k for given i and l, we assume that the average payment convenience is identical across location l for any individual i. This assumption implies

$$\sum_k \left(a_{iM}^k\right)^\theta = \sum_k \left(a_{iH}^k\right)^\theta. \tag{3}$$

We now define the relative competitiveness index as $\left(\frac{a_{ijM}/p_{jM}}{a_{ijH}/p_{jH}}\right)^\theta$, which compares the quality-to-price ratio of the same category between Mainland China and Hong Kong. If $\left(\frac{a_{ijM}/p_{jM}}{a_{ijH}/p_{jH}}\right)^\theta > 1$, regardless of the value of θ, we infer that category j in Mainland China is more competitive than the same category in Hong Kong. For any given θ, the magnitude of the index reflects the level of advantage Mainland China has over Hong Kong. Conversely, when the index is less than one, the closer it approaches zero, the greater the advantage Hong Kong has over Mainland China in that category.

We now outline the procedures of inferring the relative competitiveness index using the AlipayHK aggregated data. According to equation (2), the relative competitiveness can be written as

$$\left(\frac{a_{ijM}/p_{jM}}{a_{ijH}/p_{jH}}\right)^\theta = \left(\frac{a_{iH}^A}{a_{iM}^A}\right)^\theta \frac{E_{ijM}^A}{E_{ijH}^A}. \tag{4}$$

Equation (4) eliminates the potential impact of unobservable cross-region heterogeneity in AlipayHK usage. It also shows that the relative competitiveness is simply equal to the expenditure share in the AlipayHK aggregated data adjusted by a scalar common to all categories.

To obtain the relative competitive index, we have to infer $\left(\frac{a_{iH}^A}{a_{iM}^A}\right)^\theta$ from the data. To this end, we use equation (2) and (3) to obtain the expenditure share in Mainland China relative to Hong Kong

$$\frac{\pi_{iM}}{\pi_{iH}} = \frac{\sum_{j,k}\left(a_{ijM}^k/p_{jM}\right)^\theta}{\sum_{j,k}\left(a_{ijH}^k/p_{jH}\right)^\theta} = \frac{\sum_j \left(a_{ijM}/p_{jM}\right)^\theta}{\sum_j \left(a_{ijH}/p_{jH}\right)^\theta} \tag{5}$$

where π_{iM} and π_{iH} represent the expenditure shares in Mainland China and Hong Kong, respectively. Aggregating equation (4) across categories and combining with (5), we establish

$$\left(\frac{a_{iH}^A}{a_{iM}^A}\right)^\theta = \frac{\pi_{iM}/\pi_{iH}}{E_{iM}^A/E_{iH}^A} \tag{6}$$

where E_{iM}^A and E_{iH}^A denote the total expenditure of individual i in Mainland China and Hong Kong via AlipayHK, respectively. This equation allows us to calibrate $\left(\frac{a_{iH}^A}{a_{iM}^A}\right)^\theta$ using data from the average AlipayHK user. In 2024, combining both online and offline channels, the total expenditure of AlipayHK users in Mainland China is 11% of their total expenditure in Hong Kong, i.e. $E_{iM}^A/E_{iH}^A = 0.11$.

In Section 2, we estimate the expenditure shares of all Hong Kong residents to be 3.6% in Mainland China and 91.5% in Hong Kong. Substituting the ratio into into equation (6), we can find that

$$\left(\frac{a_{iM}^A}{a_{iH}^A}\right)^\theta = 0.11 \times \left(\frac{\pi_{iH}}{\pi_{iM}}\right) = 2.8. \tag{7}$$

With the measure of relative convenience, we apply the equation (4) to illustrate the relative competitiveness of each category. The blue bar in Figure 14 reports the relative competitiveness index for 16 subcategories. Across these categories, we find that life services in Mainland China are significantly more competitive than in Hong Kong. On the other hand, Hong Kong consistently appears more attractive in most other categories, including grocery, jewelry, and clothing shopping, dining and beverages, as well as medical and educational services.

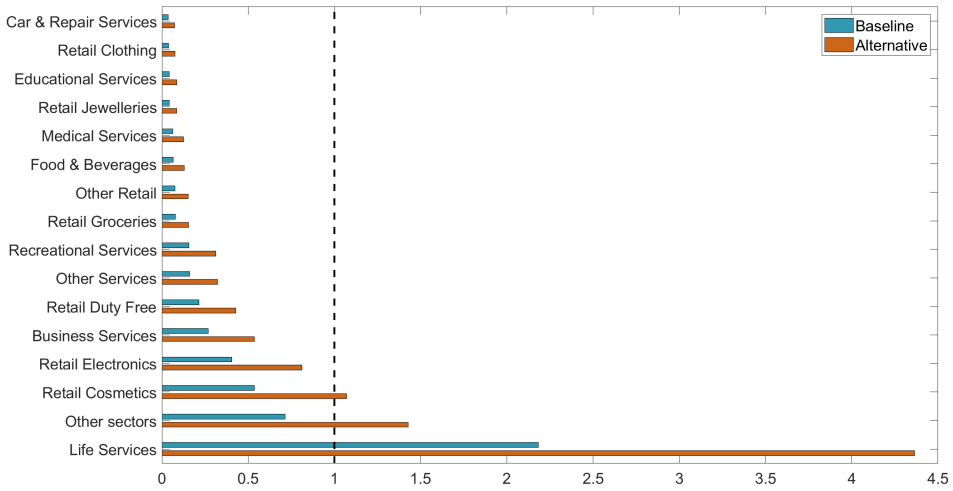

Figure 14: Relative Competitiveness Index

Note: The figure plots the relative competitiveness index across 16 subcategories under the baseline case ($\left(a_{iM}^A/a_{iH}^A\right)^\theta = 2.8$) and alternative case ($\left(a_{iM}^A/a_{iH}^A\right)^\theta = 1.4$). For each subcategory, Mainland goods and services are more competitive when the relative competitiveness index exceeds one.

In the accounting exercise, we use the aggregate expenditure share ratio $\frac{\pi_{iH}}{\pi_{iM}}$ from Section 2 to infer relative competitiveness. However, our category-level expenditure data are drawn exclusively from AlipayHK users, whose cross-border spending patterns may differ from those reflected in the aggregate data. To account for this, we consider an alternative scenario in which the AlipayHK users' ratio $\frac{\pi_{iH}}{\pi_{iM}}$ is only half the aggregate value. This implies a relative convenience term of $\left(a_{iM}^A/a_{iH}^A\right)^\theta = 1.4$. The orange bar in Figure 14 confirms that our two main findings remain robust in this alternative case.[15]

[15]It is worth noting that the model simplifies cross-border shopping behavior by ignoring travel costs and the heterogeneous usage patterns of AlipayHK across categories. Considering these factors might make Mainland China more competitive in certain categories, such as retail cosmetics and electronics.

5 Concluding Remarks

This report documents a set of facts on the size of Hong Kong travelers to Mainland China and their spending patterns. Using official statistics, we assess the common perception that the recent surge in spending by Hong Kong residents in Mainland China is the primary driver of the decline in some consumer service sectors in Hong Kong. We find, instead, this post-pandemic increase in cross-border travels and spending appears to reflect a return to pre-pandemic patterns. This suggests that the decline in Hong Kong's consumer services is more likely attributable to other factors that have changed since 2020, such as falling asset prices and reduced visitor numbers to Hong Kong.

The aggregate statistics from AlipayHK further reveal a shift in Hong Kong residents' expenditures in Mainland China – from retail to services. As a result, concerns about the competitive threat posed by Mainland China's retail sector and improved cross-border connectivity – often seen as major risks to the survival of Hong Kong's retail sector – are likely overstated. Moreover, our competitiveness index indicates that most retail and service sectors in Hong Kong remain competitive relative to their Mainland counterparts. However, certain sectors may face significant challenges due to deeper integration with the Mainland economy. For example, our analysis suggests that Hong Kong's life services sector is less competitive than its Mainland counterpart, even from the perspective of Hong Kong residents who may exhibit a home bias.

Finally, we observe a growing integration of Hong Kong travelers using AlipayHK into Mainland cities, as reflected in their exploration of a wider range of destinations and a more balanced distribution of expenditures across Mainland cities. The increasing diversity in destination choices of Mainland China by AlipayHK users, coupled with their distinctly different cross-border spending patterns and the more balanced spatial distribution of service expenditures, highlight a significant degree of complementarity in service consumption between Hong Kong and Mainland China. The diversified choice and complementarity may enhance welfare gains for Hong Kong residents through improved access to Mainland services—a dynamic that warrants further exploration to fully understand its magnitude and implications.

References

[1] Burstein, A., Lein, S., Vogel, J., 2024. Cross-border shopping: evidence and welfare implications for switzerland. Journal of International Economics. 152, 104015.

[2] Chen, X., Pei, G., Song, Z., Zilibotti, F., 2023. Tertiarization like china. Annual Review of Economics. 15 (1), 485–512.

[3] Gao, X., Han, J., Song, Z., 2025. Cross-border service consumption: Evidence from hongkongers in mainland china. Working Paper in Progress.