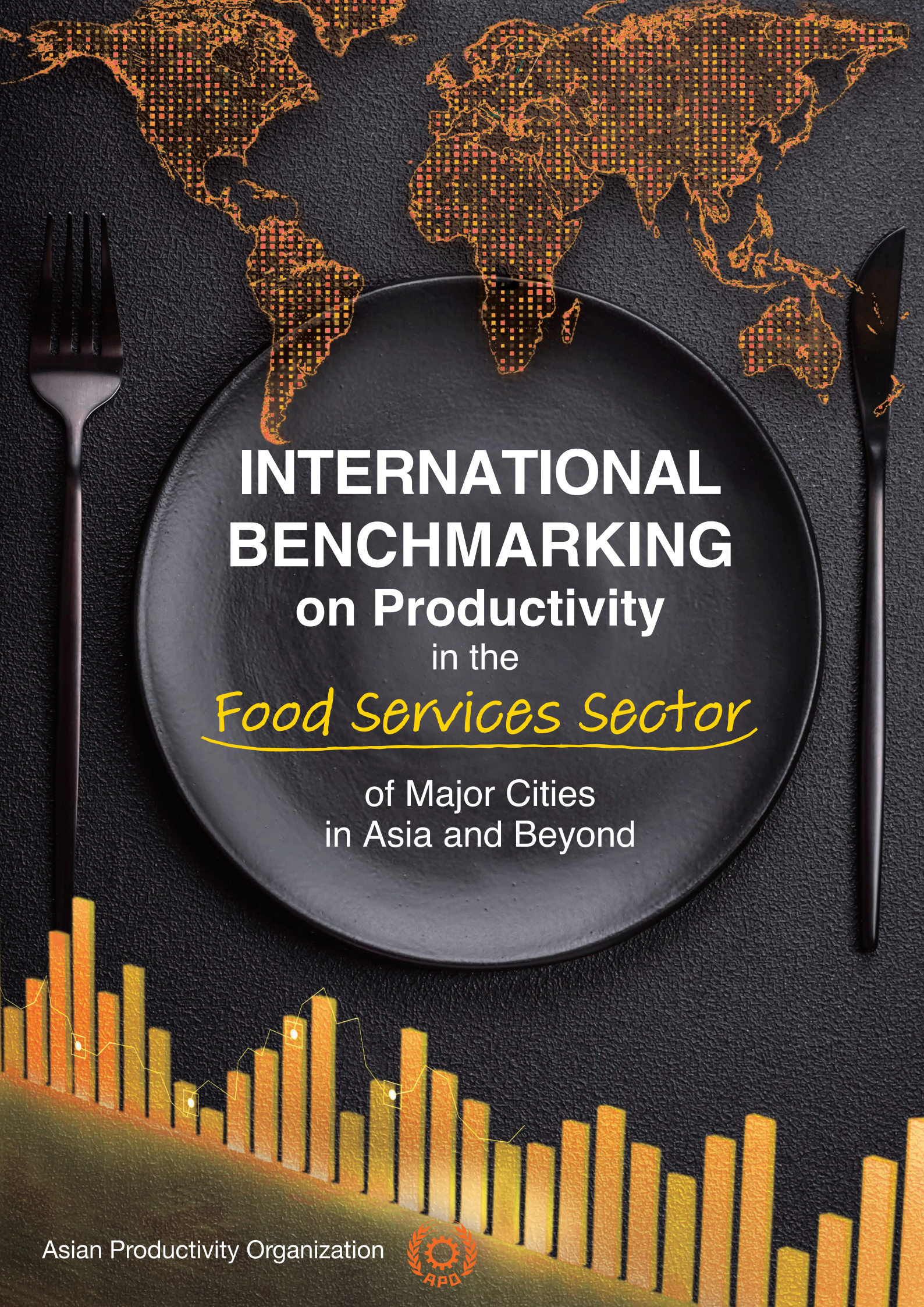
INTERNATIONAL
BENCHMARKING
on Productivity
in the
Food Services Sector
of Major Cities
in Asia and Beyond
Asian Productivity Organization
APO

INTERNATIONAL BENCHMARKING ON PRODUCTIVITY IN THE FOOD SERVICES SECTOR OF MAJOR CITIES IN ASIA AND BEYOND

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International Benchmarking on Productivity in the
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Dr. Kuan-Huei Lee served as the volume editor.

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FOREWORD

The food services sector in APO member economies has long been a cornerstone of economic growth and development. The Asia-Pacific region, known for its rich culinary heritage and diverse food preferences, has witnessed a significant surge in this sector in recent decades due to urbanization, rising incomes, and changing consumer preferences. This growth has created new opportunities for businesses and contributed to economic prosperity across the region.

This benchmarking study analyzed the food services sector performance of four cities in advanced member economies, Seoul, Singapore, Taipei, and Tokyo; two major cities in the Asia-Pacific, Chengdu and Hong Kong; and two leading international cities, London and New York City. The food services sector's performance across these eight major hubs was evaluated and compared to identify critical productivity drivers, emerging business models, and best practices in the food services industry.

By analyzing standardized metrics, such as sales per employee or sales per square foot, this study established a baseline for operational efficiency and business performance. It also investigated factors influencing productivity differences, such as infrastructure, workforce quality, consumer behavior, labor policies, technology use, and organizational practices, to understand why some cities or models perform better. Based on the analysis and findings, this report offers actionable, evidence-based recommendations and highlights successful practices from top-performing cities for broader application across APO member economies.

The research reveals that although all cities grapple with labor shortages, rising costs, and evolving consumer demands, their productivity levels vary significantly. High-performing cities succeed by embracing digital tools and streamlining operations while benefiting from strong institutional support. In contrast, other cities fall behind because of inconsistent technology adoption and regulatory or cultural challenges. These findings offer a clearer understanding of global productivity dynamics, highlighting both strengths and areas for improvement. It is our hope that these findings and recommendations will offer valuable insights for policymakers, business leaders, and industry practitioners to address productivity gaps, strengthen operational resilience, and enhance the sector's long-term competitiveness and sustainability across diverse economic contexts.

The APO expresses its heartfelt appreciation to the research team from the Singapore Institute of Technology, including Dr. Kuan-Huei Lee, Associate Professor and Director of Programmes in the Business, Communication and Design Cluster, and Carol Nguyen, Data Analyst, and all other contributors and

supporting organizations for their invaluable insights and efforts in producing this report. May the meaningful perspectives and global benchmarks shared in this publication empower stakeholders in the food services sector to enhance their competitiveness and performance.

Dr. Indra Pradana Singawinata
Secretary-General
Asian Productivity Organization
Tokyo

PREFACE

The food services sector is a vital contributor to urban economies but faces growing pressures from labor shortages, rising costs, and changing consumer expectations. Improving productivity has therefore become essential to sustaining the sector's competitiveness and resilience.

This APO-commissioned benchmarking study compares food services productivity across eight global cities, Chengdu, Hong Kong, London, New York City, Seoul, Singapore, Taipei, and Tokyo, using standardized metrics and expert insights. Rather than ranking performance, the study highlights key productivity drivers, practical innovations, and transferable lessons to support policymakers and industry stakeholders.

It is our hope that the findings will contribute to evidence-based decision-making and cross-city learning in advancing productivity and sustainability across the food services sector.

Dr. Kuan-Huei Lee
Associate Professor and Director of Programmes
Business, Communication & Design (BCD) Cluster
Singapore Institute of Technology

EXECUTIVE SUMMARY

This international benchmarking study, commissioned by the Asian Productivity Organization (APO), analyzes food services sector productivity across eight global cities: Chengdu, Hong Kong, London, New York City, Seoul, Singapore, Taipei, and Tokyo.

Data were sourced from official statistical departments and supplemented by semi-structured interviews with local food services experts. Key productivity metrics include the annual growth rate of sales per man-hour and monthly sales per square foot.

Key Findings

1. Pre-COVID (2012–2019), annual sales growth per employee in Hong Kong, Singapore, and Seoul moved in tandem. The 2020 shock induced contractions, sharpest in Singapore, followed by a recovery led by Seoul, with a strong rebound in Singapore and a comparatively modest one in Hong Kong.

2. Sales per square foot: Taipei, London, Hong Kong, and Singapore were in the lead.

3. Common challenges: Rising operating costs, persistent labor shortages, shifting consumer preferences, and uneven technology adoption affect all eight cities despite differing cost structures and labor conditions.

Emerging Innovations

1. Tokyo and Chengdu stand out in robotics adoption and digitally integrated service ecosystems.

2. New York City and Singapore excel in process design.

3. Taipei demonstrates sustainability leadership through regulatory compliance, consumer awareness, and waste reduction.

Strategic Recommendations

1. Strengthen policy support for technology adoption, workforce upskilling, and spatial efficiency.

2. Develop benchmarking platforms with standardized metrics and case studies.

3. Encourage cross-city collaboration through data sharing and regional working groups.

4. Embed longitudinal measurement of productivity and sustainability indicators.

This study lays the groundwork for enhancing productivity, resilience, and sustainability in the food services sector across the Asia-Pacific region. It also provides a replicable framework for cross-city benchmarking and international knowledge exchange.

INTRODUCTION

Background of Asia's Food Services Sector and the Role of the Asian Productivity Organization

Asia's food services industry has experienced significant growth over the past few decades, driven by urbanization, rising disposable incomes, and evolving consumer preferences. Major cities such as Chengdu, Hong Kong, Seoul, Singapore, Taipei, and Tokyo have emerged as culinary hubs, blending rich cultural traditions with modern innovations to meet the needs of diverse and discerning consumers.[1]

Amid this dynamic landscape, the Asian Productivity Organization (APO) has advanced productivity in key sectors, including food services. Established on 11 May 1961, in Tokyo, Japan, the APO is a non-political, non-profit intergovernmental organization comprising 21 member economies. Its mission is to promote sustainable socioeconomic development in the Asia-Pacific region through productivity enhancement.

As a think tank, policy advisor, and innovation catalyst, the APO initiates projects in industry, agriculture, services, and public sectors. In the food services industry, the APO has led conferences and research programs that focus on digital transformation, sustainability, and consumer satisfaction. Notably, one conference explored the use of data analytics, artificial intelligence (AI), and the Internet of Things (IoT) to improve operational efficiency, sustainability, and consumer satisfaction.

This benchmarking study evaluates and compares food services sector performance across six Asian cities—Chengdu, Hong Kong, Seoul, Singapore, Taipei, and Tokyo—and two international cities: London and New York City (NYC). By leveraging the APO's regional frameworks and fostering cross-border knowledge exchange, the study aims to identify critical productivity drivers, emerging business models, and best practices in the food services industry.

This comparative analysis will provide policymakers, business leaders, and industry practitioners with insights to address productivity gaps, enhance operational resilience, and improve the sector's long-term competitiveness and sustainability across diverse economic contexts.

[1] UNESCO (2020) describes Chengdu as a vibrant culinary hub that blends rich traditions with modern innovations to serve diverse consumers. Tokyo's food scene combines deep-rooted traditions with innovative cuisines, catering to global tastes and modern dietary needs (Go Tokyo, 2025). Henderson (2016) emphasizes that Singapore's food culture serves as a dynamic hub, weaving together multicultural traditions and modern innovations to create appealing dining experiences for diverse consumers. The Korea Tourism Organization (2025) notes that the Republic of Korea's (ROK) food scene seamlessly integrates centuries-old traditions with modern innovations to attract a diverse range of diners, with recognition from MICHELIN highlighting its ongoing evolution. An article by the Michelin Guide (2025b) reports that chefs in Hong Kong blend traditional soy food with modern innovation to satisfy discerning diners. ROC's food producers merge traditional snacks with innovations, such as healthier ingredients and ready-to-eat formats, to meet the needs of modern consumers (Innovation Hub, TAITRA, 2024).

Objective of the Benchmarking Study

In support of the APO's mission to enhance productivity and promote sustainable growth across its member economies, this study is guided by the following key objectives:

1. *To Conduct a Benchmarking Study on Productivity Levels in the Food Services Sector Across Selected Cities*
   This objective involves the systematic collection and comparison of quantitative and qualitative data from prominent Asian and international cities. Using a standardized framework of productivity metrics, such as annual growth rate of sales per employee and sales per square foot, the study aims to establish a comparative baseline reflecting operational efficiency and business performance across various market contexts and regulatory environments.

2. *To Uncover Key Drivers and Constraints of Productivity*
   Beyond basic comparisons, the study conducts an in-depth analysis of the factors influencing productivity variations across cities. It examines urban infrastructure, workforce quality, consumer behavior, labor policies, technology integration, and organizational practices. The aim is to identify patterns and contextual factors that explain why certain cities or business models excel in resource utilization, customer throughput, and cost-efficiency.

3. *To Provide Actionable Recommendations and Best Practices for Improving Productivity in the Food Services Sector*
   Drawing on the benchmarking results and analysis, the study presents evidence-based strategies for food services operators, industry associations, and policymakers. Recommendations include productivity-enhancing approaches such as workflow redesign, workforce upskilling, digital technology adoption, and menu optimization, applicable to various APO member economies. The study also highlights replicable best practices from high-performing cities that can serve as models for regional learning and adaptation.

Importance of Food Services Productivity Benchmarking

The food services sector is not only a cultural cornerstone but also a significant economic driver in major global cities. Besides contributing to employment and gross domestic product (GDP), it also plays a vital role in shaping tourism, urban lifestyles, and local supply chains. However, the sector faces challenges, including chronic labor shortages, rising operational and rental costs, and diverse and dynamic consumer expectations, from demands for healthier food options to personalized, on-demand service experiences.[2]

[2] The food sector in NYC is critical to the city's economy and culture. However, in 2024, it faces declining sales, high labor and rental costs, regulatory challenges, and evolving consumer expectations (NYC Hospitality Alliance, 2024). The Singapore food services sector serves as a *cultural anchor* and a key economic driver, shaping urban lifestyles and tourism while contributing significantly to employment and GDP. It confronts persistent labor shortages, rising costs, and changing consumer preferences for healthier, personalized, and experiential dining (USDA Foreign Agricultural Service [FAS], 2024b; Renub Research, 2024). The UK food services sector is a key economic contributor and cultural mainstay, driving employment, urban vibrancy, and local supply chains. However, it faces significant challenges from elevated labor and operational costs, skill shortages, and shifting consumer preferences towards health and personalized experiences (Tokio Marine HCC, 2025). China's restaurant sector, vital for jobs and urban culture, experienced mass closures in 2024 due to high costs and changing consumer habits (Reuters, 2025a); Japan's food services industry is a core economic driver and cultural influence, fueling over USD226 billion in sales in 2023 as tourism and urban lifestyles grew; yet the sector faces acute challenges from persistent labor shortages, cost hikes, and surging demands for healthier and more personalized dining (USDA FAS, 2024a). The food services sector in ROC is facing critical labor shortages, despite government efforts (Taiwan News, 2025). In the US, the sector is contending with persistent labor shortages, rising costs, and growing demands for healthier and personalized dining (Mintel, 2025). Hong Kong's food services sector, which is home to over 12,000 diverse restaurants and serves as a global tourism hub, also struggles with labor shortages, high rents, and fast-evolving consumer demands for healthy, personalized dining (USDA FAS, 2024c); the ROK's food services industry is a vital economic and cultural pillar, posting sales of USD137.1 billion in 2022 and supporting a significant workforce, yet the sector grapples with persistent labor shortages, rising costs, and rapidly evolving consumer preferences for health, convenience, and personalized dining (USDA FAS, 2024d).

The COVID-19 pandemic has exacerbated existing pressures, resulting in disruptions. Temporary closures, fluctuating dining restrictions, and a shift in delivery models have impacted workforce structures, consumer behavior, and business sustainability. In this context, efficiency, innovation, and adaptability are essential for survival and future success.

This study represents an international benchmarking effort focused on food services productivity. By comparing key performance indicators across eight cities (Chengdu, Hong Kong, London, NYC, Seoul, Singapore, Taipei, and Tokyo), the study offers insights into how diverse economies and operational models address shared challenges.

This benchmarking study is not just a snapshot of current conditions, it is a resource designed to support sustainable development, digital readiness, and operational resilience in the food services sector for the future.

Benchmark Cities

This study examines food services productivity in a select group of global cities, comprising a mix of advanced APO member economies and leading urban centers with mature and dynamic food sectors.

1. *Chengdu* – Famous for its rich culinary heritage, strong local dining culture, and growing integration of modern dining formats alongside traditional operations.

2. *Hong Kong* – A fast-paced dining hub combining high population density with a strong culture of eating out, characterized by compact spaces and quick-service turnover.

3. *London* – A cosmopolitan food capital with a diverse culinary scene, strong regulatory standards, and emphasis on workforce productivity.

4. *NYC* – A dynamic culinary hub renowned for its diverse dining scene, rapid adoption of technology, and relentless pace, where innovation and competition drive both operational efficiency and customer experience.

5. *Seoul* – A highly connected smart city with a strong culture of food delivery innovation and technology integration.

6. *Singapore* – A global food destination celebrated for its efficient infrastructure, strong government support for the food services sector, and seamless integration of technology into dining experiences.

7. *Taipei* – Noted for its vibrant night markets, independent food operators, and evolving café culture.

8. *Tokyo* – Renowned for its diverse culinary offerings, deep-rooted dining traditions, and innovative approaches that balance efficiency with exceptional hospitality.

These cities were selected for their economic maturity, distinctive food services ecosystems, and potential insights into productivity, innovation, and resilience.

Sub-sector Coverage

The benchmarking study evaluates productivity in the food services sector across three key sub-sectors: Full-Service Restaurants (FSR), Quick-Service Restaurants (QSR, excluding fast food chains), and cafés/specialist coffee shops. Each city's official statistics classify food services differently. In some cases, the classification aligns closely with the study's sub-sectors, enabling direct comparison. In others, definitions or groupings vary significantly. For these instances, smaller or overlapping categories will be consolidated into the closest matching sub-sector, with reference to the city's official classification to ensure accuracy and cross-city comparability. Definitions of the three sub-sectors are provided in Appendix A.

METHODOLOGY

Research Design Overview

This international benchmarking study employs a mixed-methods approach, integrating quantitative data from official statistics with qualitative insights from industry experts. The aim is to provide a comprehensive understanding of productivity performance in the food services sector across the selected cities.

Quantitative Data Collection – Official Statistics

Core productivity indicators for each city were derived from official government statistical departments, national economic databases, and sector-specific food services reports. These datasets formed the quantitative foundation of the analysis, ensuring accuracy, credibility, and comparability.

Qualitative Data Collection – Expert Interviews

To complement the quantitative analysis and capture current on-the-ground trends, we conducted semi-structured interviews with experts in the food services sector in each city where contacts were available. Interviewees included food services operators, brand managers, and trade association representatives. Discussions focused on staffing models, operational challenges, and the adoption of automation and innovation. These insights provide context for interpreting statistical findings and reveal current perspectives on each city's food services landscape.

Methodology Adaptation and Cross-City Comparability

Owing to variations in data classification, granularity, and availability across cities, smaller or overlapping categories were consolidated into three core sub-sectors: FSR, QSR, and cafés/ specialist coffee shops. Triangulation of multiple data sources and normalization techniques, including Purchasing Power Parity (PPP) adjustments to convert local currencies to International Dollars, were employed to enhance comparability while maintaining the integrity of each city's classification system.

OVERVIEW OF THE GLOBAL FOOD SERVICES SECTOR

Chengdu

Chengdu is a major hub of China's food services industry, with over 11,768 outlets employing approximately 225,204 people by the end of 2023 (Sohu, 2025a). The city's food services sector includes a diverse mix of hotpot restaurants, banquet-style eateries, street food vendors, cafés, and traditional tea houses. According to the National Bureau of Statistics of China (2024), Chengdu's food services market generated CNY135.2 billion (USD18.9 billion) in revenue in 2024, accounting for 5.8% of the city's GDP (Sichuan Provincial Department of Housing and Urban–Rural Development, 2025) and 2.4% of China's total food services market (National Bureau of Statistics of China, 2025; Statista, 2025).

Consumer behavior in Chengdu reflects a cultural affinity for communal and experiential dining, particularly around hot pot and banquet-style meals. While full-service dining remains dominant, anchored by strong culinary traditions and social dining norms, emerging trends among younger consumers are reshaping the landscape. Post-1995, increased attention has been drawn to lighter, healthier meals, as well as solo or small-group formats, with restaurants offering aesthetic and emotionally resonant experiences (Sohu, 2025). These younger diners prefer personalized settings, fusion cuisine, and individual dining options over traditional all-you-can-eat formats. Despite rising costs, food remains central to lifestyle and identity, driving a mix of traditional and modern demand in Chengdu's food services market.

Although labor costs in Chengdu are lower than in coastal cities like Shanghai and Shenzhen, food services operators face challenges from rising ingredient prices and increasingly stringent food safety regulations. In response, the local government has implemented supportive initiatives. Notably, Jinniu District launched a "one-stop service" to streamline restaurant licensing, reducing processing time by 86%, the number of required documents by 55.9%, physical visits by over 80%, and the number of approval steps by 66.7%. Through cross-agency coordination, a single-window system, digital tools (e.g., WeChat mini-programs for virtual surveys), and "nanny-style" support, the program has raised the first-time license approval rate to over 90%, easing market entry and boosting regulatory efficiency (The People's Government of Sichuan Province, 2024).

Technology adoption is transforming Chengdu's food services sector. Digital ordering systems, QR code menus, and AI-assisted kitchen management tools are now commonplace, particularly among younger, tech-savvy operators. A Chengdu community restaurant drew attention in 2025 for utilizing AI-powered cooking robots that can prepare classic Sichuan dishes, such as twice-cooked pork, in just two minutes (Sichuan Online, 2024). These machines deliver restaurant-level flavor, standardize output, and reduce labor costs, earning praise from diners for both taste and affordability. By integrating smart kitchen technology, operators enhance efficiency and maintain service consistency, demonstrating how digital innovations are improving productivity and customer satisfaction in China's evolving food services industry (Sichuan News, 2024).

Sustainability is an emerging priority in Chengdu's food services sector, driven by municipal policies and grassroots innovation. The local government has introduced guidelines to reduce kitchen waste, promote greener packaging, and encourage energy-efficient upgrades in food services establishments (UNICEF, 2023). According to Sichuan Daily (2025), Chengdu is advancing citywide waste sorting by integrating regulations, market incentives, and community participation, resulting in over 90% of neighborhoods involved and daily kitchen waste processing capacity exceeding 2,300 tons.

Hong Kong

According to Hong Kong's Census and Statistics Department (2023), Hong Kong is a key center of Asia's food services industry, with over 15,516 restaurants and cafés employing approximately 225,468 professionals. The food services landscape includes traditional Cantonese banquet halls, cha chaan teng cafés, international fine dining venues, street food markets, and a growing quick-service and specialty beverage scene. In 2024, the food services market generated a revenue of HKD138.2 billion (USD17.7 billion). FSR led the sector, accounting for 61.4% of total sales, followed by QSR at 23.5% (GlobeNewswire, 2025).

Consumer behavior in Hong Kong's food services sector is shifting toward convenience, affordability, and wellness-oriented choices. Fast-food sales are projected to increase 6.8% by 2030, and 93% of restaurateurs viewed food delivery platforms as "increasingly essential" in 2024 (Restroworks Blog, 2025b). Health-conscious and plant-based dining options are gaining popularity, reflecting broader lifestyle trends (La Rioja, 2022). Culinary innovation, including fusion cuisines and novel menu items, continues to attract diverse demographics and reinforces the city's image as an "ever-evolving culinary landscape" (Michelin Guide, 2025a). The sector also faces pressure from cross-border dining, as more consumers seek cost-effective alternatives in Shenzhen, impacting local spending (Hale, 2024).

Hong Kong's food services sector operates under a strict regulatory framework focusing on food safety, licensing, compliance, and sustainability. To support small and medium-sized enterprises (SMEs), the Hong Kong Government launched the Digital Transformation Support Pilot Programme, offering matching grants of up to HKD50,000 (USD6,400) to help food services operators adopt digital tools such as point-of-sale (POS) systems, e-payment solutions, and customer management software (SME Link, n.d.). This initiative reflects the government's commitment to fostering resilience and innovation in the sector.

Technology adoption is rapidly transforming Hong Kong's food services sector. Automated solutions, including robot chefs, waiter robots, and smart food delivery machines, are increasingly common. For instance, "Food On" at Hong Kong Science Park employs robots for cooking, serving, and delivery, enabling quicker service (three-minute meals) while enhancing food safety and efficiency (Africanews, 2024). Additionally, Bowlbie Restaurant & Bar utilizes Konica Minolta's smart delivery robots to address staffing challenges, enhance delivery efficiency, and improve the overall customer experience. These robots streamline operations, reduce staff workload, and create a novel dining atmosphere that aligns with modern customer expectations (Konica Minolta, 2024).

Sustainability is a central priority in Hong Kong's food services sector, supported by government initiatives and industry participation. In March 2025, the Environmental Protection Department launched the Packaging Reduction Charter, urging restaurants and food services operators to adopt

sustainable packaging, track material usage, and reduce waste generation (Environmental Protection Department, 2025). The city has also implemented bans on single-use plastic cutlery and is preparing to extend restrictions on disposable tableware, prompting many outlets to shift to reusable options (Fung, 2024). To address food waste, the Pilot Scheme on Food Waste Collection provides free, point-to-point waste pickup for restaurants, along with drop-off points at refuse stations and designated "food services cluster" zones. These efforts are supported by best-practice toolkits and the Food Wise Eateries Scheme, which promotes portion control, food donation, and consumer awareness (Environmental Protection Department -The Government of Hong Kong Special Administrative Region, 2022).

London

London's food services industry is navigating recovery, reinvention, and resilience. As of 2024, London hosts over 14,000 food services enterprises, employing nearly 34,000 people and generating a turnover of approximately EUR2.1 billion (USD2.8 billion) (Office for National Statistics UK, 2025). The sector shows signs of stabilization after macroeconomic pressures from inflation, interest rate hikes, and pandemic disruptions. While cost challenges persist, like-for-like sales among leading restaurant and bar groups grew in 2023, supported by targeted pricing strategies and demand for premium experiences (BDO, 2024).

Londoners are dining out more frequently, with 13% doing so five or more times a month, primarily driven by younger consumers seeking value, personalization, and experience-led dining (Sevenrooms, 2024). In commercial districts, the demand for health-focused, quick-service concepts like The Salad Project, which serves up to 4,000 salads daily, reflects a shift toward convenient, nutritious meals (The Bottom Line, 2024). Simultaneously, fusion cuisine thrives, blending British ingredients with global flavors, while exotic citrus varieties gain traction on menus and in retail. These trends illustrate a city balancing wellness, creativity, and cultural openness.

London's food services sector operates under a comprehensive regulatory framework that includes food safety, licensing, environmental compliance, and labor standards. Key laws, such as the Food Safety Act 1990 and the Health and Safety at Work Act 1974, enforced by local councils and the Food Standards Agency, require businesses to register, undergo hygiene inspections, adhere to allergen labeling (e.g., Natasha's Law), and comply with waste management and sustainability regulations, including bans on single-use plastics. Operators must also follow UK labor laws, paying at least the National Living Wage, providing written contracts, observing working hour limits, offering statutory leave, and verifying employees' right to work.

UK restaurants are increasingly investing in technology, with 85% of industry leaders planning to adopt AI and automation by 2025 to improve efficiency and strengthen loyalty programs (Square, 2025). Consumers have responded positively, particularly to innovations addressing staffing shortages and streamlining operations. In London, QR code ordering has become widespread, enabling contactless dining experiences at popular chains like Nando's, Shake Shack, Bill's, Patty & Bun, and Vapiano (Contactless Menu, 2025). Additionally, London-based startup LoveBite AI has introduced the world's first AI video waiter, now in use at venues such as Gura Gura, La Doc, and Masalchi (London Daily News, 2025). These developments reflect a shift toward tech-driven hospitality that enhances convenience while managing operational challenges.

Sustainability is now a strategic imperative, not merely a brand differentiator. A survey by Lightspeed (2023) found that 70% of UK diners consider themselves environmentally conscious, with 36% actively seeking restaurants that demonstrate strong sustainability practices. Notably, 26% of respondents indicated they would stop patronizing a restaurant lacking sustainable initiatives. Furthermore, 70% expressed a willingness to pay more for meals at environmentally friendly establishments. These insights underscore the growing importance of sustainability in shaping consumer preferences and influencing dining choices.

New York City

In 2022, NYC's food services sector generated approximately USD32.95 billion in sales, employing around 303,946 people and supporting 24,083 establishments, underscoring its crucial role in the city's economy (US Census Bureau, 2022).

Consumer dining behavior in New York shifted noticeably between 2023 and 2025. In late 2023 and into December 2024, consumers showed signs of financial caution, with smaller average checks and a shift in visits toward quick-service and fast-casual restaurants, which performed better than full-service establishments in transaction growth (AP News, 2025). By 2025, persistent pricing pressures and strained household budgets have narrowed the perceived gap between price and value, prompting some consumers to trade back up from quick-service to casual dining in pursuit of better quality and a more satisfying experience (Bank of America, 2025). At the same time, Manhattan continues to sustain a resilient market for premium and experiential dining, supported by higher-income segments that remain less sensitive to price.

Regulation directly impacts food services operators, particularly in terms of labor costs. NYC's minimum wage for fast food workers is among the highest in the US, at USD15 per hour, following California and Washington, D.C. (Bank of America, 2025). These policies elevate labor costs and narrow margins, but the city government has introduced supportive measures, such as the permanent Open Restaurants program. This initiative enables restaurants to expand seating into sidewalks and streets, thereby increasing capacity and enhancing outdoor dining in 17 additional community districts, including underserved neighborhoods.

Technology adoption in the sector is advancing rapidly. Nearly 76% of restaurant operators nationwide believe technology provides a competitive edge, and NYC operators are heavily investing in POS upgrades, mobile apps, self-order kiosks, and AI-driven loyalty programs (National Restaurant Association, 2024). Notably, digital and third-party orders now account for 17% of total sales, surpassing counter service for the first time. Large chains and tech-forward independents are integrating AI and robotics to streamline operations, personalize marketing, and effectively manage labor shortages.

Sustainability is increasingly prioritized, supported by regulation and industry initiatives. A USD4 million state grant is funding infrastructure for recycling and diversion to combat food waste (New York State Press Releases, 2025). The "Skip the Stuff" law mandates that single-use items be provided only on request, prompting operators to adopt compostable or reusable alternatives (Sanitation, 2023). Restaurants are also aligning with the city's goal to reduce food-related emissions by 33% by 2030, with some participating in the Plant-Powered Carbon Challenge to offer low-carbon, plant-based menu options (Official Website of New York City Government, 2023).

Seoul

Seoul's food services sector is crucial to the Republic of Korea's (ROK) urban economy, comprising 132,183 establishments (16.7% of the nation's outlets), employing over 431,000 workers, and generating approximately ₩45.5 trillion (USD31.9 billion) in total sales revenue, constituting 23.7% of national food services turnover as of 2023 (Korean Statistical Information Service [KOSIS], 2023a). The sector is predominantly driven by restaurant services, which account for the majority of revenue and employment. Conversely, bars, simple eateries, and catering operations hold a smaller, less revenue-intensive market share.

In 2023, Seoul's dining habits emphasized convenience and digital integration, leading to increased popularity of dining out, delivery services, and home meal replacements (HMR). Online food-related sales represented approximately 30% of all online transactions (United States Department of Agriculture [USDA], 2025). After the pandemic, there was a notable resurgence in dining out and social gatherings, with a continued consumer focus on health, safety, and appreciation for traditional and international cuisines (USDA, 2024).

The regulatory environment in Seoul is characterized by stringent food safety and labor compliance standards. Food services operators must follow licensing protocols, hygiene requirements, and strict employment regulations, creating operational complexity, particularly for small and independent businesses. Concurrently, labor shortages and rising input costs, especially rent in prime districts and currency-affected imported ingredients, place significant pressure on operators. These challenges have contributed to declines in traditional dining formats, such as neighborhood eateries and old-style Korean restaurants (Hanjeongsik), which struggle to adapt to shifting consumer behavior and cost structures (Korean JoongAng Daily, 2025c).

Technology adoption in Seoul's food services remains low, with only 10.6% utilizing unmanned payment kiosks in 2023, slightly above the national average of 8.6% (KOSIS, 2025b). Most independent eateries rely on traditional payment methods (Etnews, 2025), while digital tools are more prevalent in large franchises and high-traffic areas (Jang, 2024). Reflecting a shift in industry mindset, Starbucks introduced its first self-service kiosks in the ROK and Japan in May 2025, starting with 10 stores in Seoul's Myeong-dong district (Korea JoongAng Daily, 2025a). This marked a significant shift for a brand that had traditionally focused on human interaction. Additionally, the use of robot servers surged, with over 5,000 in operation nationwide by 2022, a 67% increase from the previous year, driven by labor shortages and demand for contactless service (PYMNTS, 2023).

The ROK government is advancing sustainability through stricter food waste reduction policies, eco-packaging standards, the Circular Economy Plan, the recognition of new recyclables such as coffee grounds and rice bran, and labeling reforms aimed at minimizing waste. This initiative addresses the rising levels of waste, with daily plastic waste increasing by 15% in 2020, primarily due to the surge in food delivery packaging (Korea JoongAng Daily, 2021). Consequently, new standards for container thickness and excessive packaging have been implemented. Food services operators, including hotels and restaurants such as Four Seasons and Grand Walkerhill, are reducing food waste, adopting plant-based menus, and utilizing biodegradable packaging (USDA, 2022).

Singapore

Singapore's food services sector is crucial to the domestic economy, comprising over 15,700 establishments and generating more than SGD12 billion (~USD8.98 billion) in total operating receipts as of 2023 (SingStat, 2023a). The market is predominantly composed of SMEs, including full-service and QSR, cafés, kiosks, and hawker centers, which were officially added to the UNESCO Representative List of the Intangible Cultural Heritage of Humanity in 2020. The sector has shown strong recovery post-COVID-19, supported by resilient domestic demand and the return of international tourism.

Consumer behavior in Singapore reflects the urban lifestyle, characterized by frequent dining out due to compact living spaces and the prevalence of dual-income households. Demand is shifting toward convenience, with increased preferences for food delivery, takeaway options, and digital ordering. There is also a growing interest in healthier menu offerings, value-for-money meals, and experiential dining. Consumers are considering sustainability and social responsibility in their food choices, influencing brand loyalty and spending patterns (Restroworks Blog, 2025a).

The regulatory environment for food services businesses in Singapore is multi-layered, involving the Singapore Food Agency, the National Environment Agency, and the Ministry of Manpower. Operators must comply with various licensing requirements, safety and hygiene standards, and manpower regulations. The government supports business resilience and productivity through initiatives such as the Process Optimization Programme and FoodX by Enterprise Singapore (The Business Times, 2025), which help streamline workflows, adopt technology, and scale production. Additionally, Workforce Singapore's Career Conversion Programme aids workforce reskilling to enhance manpower adaptability and long-term productivity (Workforce Singapore, 2025).

Technology adoption is a key feature of Singapore's food services landscape. Digital ordering, contactless payment, and aggregator platforms are now standard across many establishments. In the back of house, kitchen display systems, smart inventory tools, and robotic automation, ranging from drink dispensing to cooking stations, are increasingly utilized. These trends are reinforced by government initiatives, such as Enterprise Singapore's Productivity Solutions Grant (EnterpriseSG, 2025), which help businesses digitalize their operations and improve efficiency.

Sustainability efforts within Singapore's food services sector are gaining momentum. In 2023, the National Environment Agency reported that food waste constituted about 11% of total waste generated in Singapore (National Environment Agency, 2025). Although this marked a 7% decrease from the previous year, improving waste management strategies remains essential. Larger food services establishments are leading in integrating sustainability into their sourcing, menu design, and brand messaging (Asia Food Journal, 2024). However, broader adoption among SMEs is evolving, with ongoing efforts to raise awareness and support for sustainable practices (PR Newswire, 2025).

Taipei

Taipei's food services sector has shown strong post-pandemic recovery, driven by resilient local demand and a gradual return of international visitors. In 2023, the ROC's total food services revenue reached a record high of TWD1 trillion (~USD32.6 billion) (Ministry of Economic Affairs, Taiwan, 2025), an 84.2% year-on-year increase, marking the fastest growth in over a decade (Shi

& Xie, 2023). By 2024, restaurant revenue reached TWD838.7 billion (~USD26.1 billion) (Ministry of Economic Affairs, Taiwan, 2025), reflecting a 2.9% year-on-year increase, driven by robust dine-in traffic and rising dining-out expenses (Focus Taiwan, 2025).

In the ROC, 41% of the population frequently dines out or purchases meals, reflecting a strong culture of convenience-driven eating (Rakuten Insight, 2022). Late-night dining is common, with 27% of people enjoying meals during late hours. Furthermore, 29% of consumers typically dine alone, indicating a growing acceptance of solo dining. There is increasing interest in healthier and plant-based options, supported by Taipei's established vegetarian culture and the expanding availability of vegan offerings (Taipei Times, 2024b). Taipei is also renowned for its vibrant night market culture, where food stalls and small eateries operate late into the night or around the clock, enhancing the city's dynamic culinary scene (Wikipedia, 2025b).

The ROC's food services sector is governed by a robust regulatory framework prioritizing food safety, traceability, and consumer protection. The Taiwan Food and Drug Administration (TFDA) requires businesses to implement traceability systems across the supply chain to ensure accountability and rapid response to safety issues. In 2024, the Ministry of Health and Welfare committed TWD1.85 billion (~USD57.6 million) over four years to strengthen food safety oversight, focusing on integrating AI for risk management, supply chain certification, and community-based monitoring (Taipei Times, 2024a).

In Taipei, food services operators are adopting digital technologies, including QR code menus, self-order kiosks, AI-enabled POS systems, and kitchen display systems, to improve efficiency and reduce labor reliance (Advantech, 2022). This shift is driven by urban labor shortages, rising consumer demand for convenience, and private sector innovation from providers like iCHEF. While most government subsidies target southern regions, Taipei's restaurants are embracing technology through market pressure and local support schemes.

Sustainability awareness is increasing, though adoption remains uneven. Taipei's food services sector is increasingly encouraged to reduce waste, switch to recyclable packaging, and implement carbon reduction strategies. These themes were highlighted at the 2024 Taipei International Food Show under the slogan "Food for Future" (FoodNavigator, 2024). However, implementation varies, with visible progress mainly among larger or multinational operators.

Tokyo

While official 2023 figures for Tokyo's food services are not publicly disclosed, regional market estimates indicate a strong performance trajectory. In May 2025, the combined eating-out market for Tokyo, Nagoya, and Osaka reached JPY313.7 billion (USD2.1 billion) (96.9% of pre-pandemic (2019) levels), marking the strongest recovery since COVID-19 (Hot Pepper, 2025a).

Dining frequency recovered to 81.0%, while unit spending rose to 119.6%, indicating a shift toward higher-value dining. In 2023, Tokyo's food services sector rebounded significantly, driven by strong local demand and changing consumer preferences. Preferences are increasingly diverse; while traditional dining formats remain popular, there is a notable shift toward Western cuisines, health-conscious options, and convenience-oriented formats. Younger consumers are driving growth in plant-based, ethical, and sustainable choices, alongside a growing interest in specialty offerings such as gourmet coffee and artisanal tea (SME Japan, 2023).

The regulatory environment encompasses stringent food safety and labor compliance standards, which require adherence to licensing, hygiene, and employment regulations, thereby adding operational complexity. Labor shortages and rising input costs, especially related to rent and imported ingredients, are putting pressure on businesses, contributing to a decline in traditional formats like izakayas, which struggle to adapt to shifting consumer patterns and evolving cost structures (McCurry, 2025).

Restaurateurs in Tokyo are adopting digital tools to address inflation and labor shortages. Digital transformation is enhancing efficiency, raising sales, and improving customer satisfaction, particularly through HR systems and self-ordering technologies (Hot Pepper, 2025b). The adoption of AI and robotics is accelerating as businesses strive to address labor shortages and enhance operational efficiency. Examples include fully automated restaurants like AI_SCAPE (Tokyoupdates, 2024) and self-driving delivery robots launched through Rakuten's last-mile logistics partnerships (IoT World Today, 2025).

Sustainability is gaining traction in Tokyo's food services sector. Japan's Food Waste Reduction Promotion Act has reinforced efforts to minimize food loss at retail and consumer levels, supported by national and municipal campaigns (World Economic Forum, 2025). Restaurants and retailers are adopting food-sharing apps like Tabete and Kuradashi, as well as AI-driven inventory management systems, and donation programs to reduce food waste and align with their sustainability efforts (Sodali, 2024). However, while large brands and policy leaders have made concrete strides, the uptake among smaller operators remains uneven.

COMPARISON OF KEY PRODUCTIVITY METRICS ACROSS GLOBAL CITIES

Annual Growth in Sales per Employee and Monthly Sales per Square Foot are the metrics used to compare productivity levels across global cities. These metrics were selected for their widespread reporting, allowing meaningful cross-city comparisons.

The analysis aimed to benchmark eight global cities. However, the Growth in Sales per Employee metric could only be analyzed for three cities, Singapore, Hong Kong, and Seoul, due to the availability of reliable and comparable data.

Data for international benchmarking among the eight cities was primarily sourced from official statistical departments. When data was unavailable, supplementary information from credible open sources (e.g., property websites) was utilized.

Analysis of Growth in Sales per Employee

Sales per employee metrics were selected as a benchmark due to their simplicity and comparability across cities. They provide a straightforward measure of output relative to labor input and are easy to compute and interpret. In the absence of more granular data—such as value-added per worker or hours worked—they serve as a practical proxy for labor productivity in the food services sector.

While the sales per employee indicator is a useful starting point, international productivity studies indicate that focusing on the growth rate of sales per employee yields more accurate cross-country comparisons. The growth rate has distinct advantages for international benchmarking:

First, it adjusts for differences in baseline levels. Cities may start at varying productivity levels due to differences in wages, consumer prices, and industry structures. By focusing on relative change, the growth rate enables a more equitable assessment of progress over time and avoids penalizing economies that begin from a lower base.

Second, it mitigates structural distortions across markets. Absolute values, such as sales per employee, can be influenced by factors including staffing patterns, operating hours, cultural dining habits, and the proportion of part-timers and informal labor. In contrast, the growth rate reduces the impact of these variations, providing a clearer view of underlying productivity improvements over time in cities.

Third, the use of growth rates is well established in international research. Numerous comparative studies in the service sector employ growth rates as a standardized means of benchmarking across diverse economic contexts. For instance, the Asian Development Bank's (ADB) study on *Service Sector Productivity and Economic Growth in Asia* (Jong-Wha Lee and Warwick J. McKibbin) used productivity growth rates (%) for cross-country comparisons of labor productivity (Lee &

McKibbin, 2014). Similarly, another ADB study on *Productivity and Trade Growth in Services* relied on changes in productivity levels for benchmarking selected service sectors internationally (Shepherd, 2019).

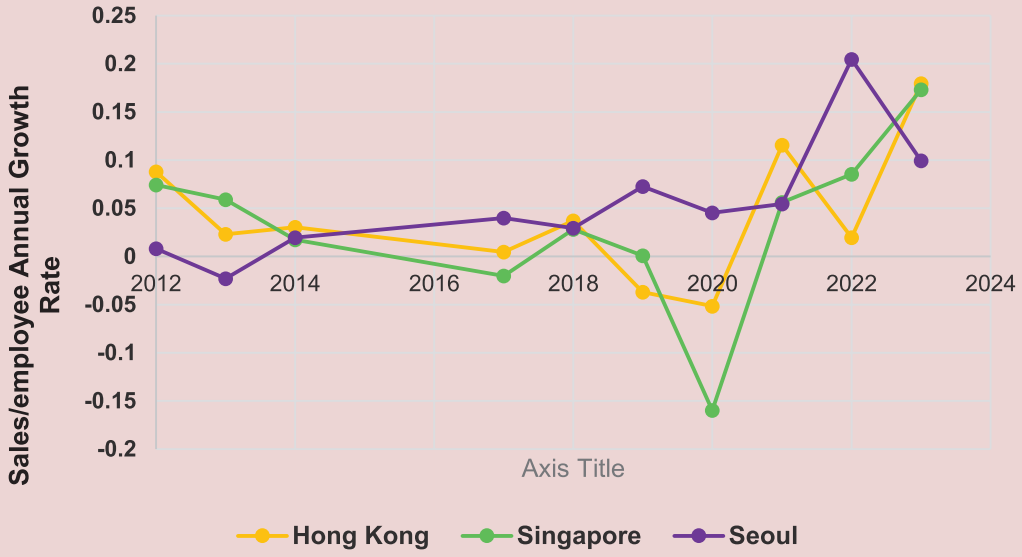
In summary, growth in sales per employee not only addresses data limitations but also serves as a more robust indicator of productivity evolution in the food services sector across cities.

Comparison: Annual Growth Rate of Sales per Employee

Figure 1 below compares the annual growth rate of sales per employee across three cities: Hong Kong, Singapore, and Seoul

FIGURE 1

GROWTH RATE TRENDS OF ANNUAL SALES PER EMPLOYEE.



Source: Summary by industry and amount of sales; C&SD: Table 625-76103: Principal Statistics for All Establishments by Industry Grouping and Sales and other Receipts (Accommodation and Food Services Sector); DOS | SingStat Website - Know My Industry - Food & Beverage Services.

From 2012 to 2019, the trajectories of Hong Kong, Singapore, and Seoul closely aligned with modest fluctuations. After 2019, however, their paths diverged, raising questions about the factors driving this divergence following the onset of COVID-19. This analysis is structured across three phases, pre-COVID, COVID disruption, and post-COVID recovery, to examine common patterns observed before the pandemic and the factors contributing to their divergent trajectories thereafter.

Pre-COVID-19 Period (2012–2019)

During this period, the three cities exhibited distinct trajectories. Singapore faced a steady decline from 2012 to 2017, followed by a slight recovery in 2018. Hong Kong maintained a stable yet slightly downward trend until 2018, after which it declined further in 2019. Seoul, initially low, gradually improved from 2013 to 2019, surpassing Hong Kong and Singapore in some years.

COVID-19 Disruption (2020)

The pandemic-induced economic shock severely impacted all three cities. Singapore experienced the most significant contraction, with its sales-per-employee growth rate dropping to nearly -0.16. While Hong Kong and Seoul also experienced declines, their contractions were less severe.

Post-COVID-19 Recovery (2021–2023)

Following the disruption, all three cities experienced a sharp rebound. Seoul demonstrated the strongest recovery, with a growth spike exceeding 0.2 in 2022. This rebound can be attributed to high-margin segments such as franchise and large-chain food services formats, which were expanding rapidly in the ROK before COVID-19 (Government of Canada, 2025). These formats benefited from established branding, standardized operations, and supply chains, enabling a quicker restart once restrictions were lifted.

Additionally, digital and delivery services gained significant traction in the ROK between 2019 and 2020. The country's online food delivery market expanded by nearly 80% in 2020 compared to 2019, reflecting a significant increase in consumer adoption (Rha et al., 2023). This well-established digital and delivery ecosystem sustained demand during restrictions and allowed operators to scale rapidly once dine-in activity resumed.

Key Takeaways

In summary, Singapore's sales-per-employee growth exhibits greater volatility, characterized by deeper downturns during crises but strong rebounds. This sensitivity reflects structural challenges, such as high operating costs and a heavy reliance on tourism and office district demand, which amplify the impact of external shocks.

The strong rebound in Singapore can be attributed to substantial government support measures for the food services sector, including the Property Tax Rebate for Non-Residential Properties in 2020 (Inland Revenue Authority of Singapore, 2025a), government-funded rental relief grants that eased fixed costs for restaurants and cafés, and wage subsidies of up to 75% under the Jobs Support Scheme (OCBC, 2020) during peak crisis months. Additional assistance, such as Deferred Tax Payments (Inland Revenue Authority of Singapore, 2025b), further alleviated financial pressures. Collectively, these measures enabled food services businesses to remain resilient and recover strongly after COVID-19 restrictions were lifted.

Seoul's food services sector reflects resilience, supported by steady pre-pandemic growth in franchise formats and widespread adoption of digital and delivery platforms. These factors enabled a rapid post-pandemic rebound as demand surged once restrictions eased.

In contrast, Hong Kong's performance remained relatively stable. Consistent local dining demand provided a stable foundation but limited the potential for a sharp rebound compared to Singapore and Seoul during the recovery phase.

Analysis of Monthly Sales per Square Foot

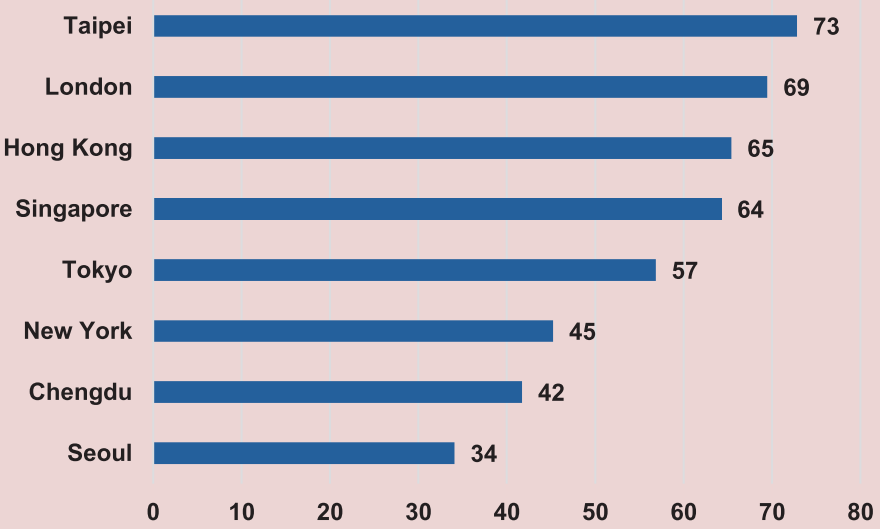
Monthly sales per square foot are a key indicator of how efficiently food services establishments utilize space in dense urban settings. It reflects the relationship between real estate usage and business performance. This section identifies cities where businesses generate the highest revenue

relative to their physical footprint, examining key factors such as market demand, rental costs, and consumer behavior that influence space productivity across eight global cities.

Figure 2 below compares monthly sales per square foot across eight global regions.

FIGURE 2

MONTHLY SALES/SQUARE FOOT COMPARISON ACROSS GLOBAL CITIES.



Source: Official statistical departments of respective cities (sales data); property websites (average shop area, author's calculation).
Note: Figures converted to international dollars (IntUSD) using PPP adjustments. Full list of sources is provided in the Annex.

No. 1: Taipei (Int USD73/sqft)

Taipei's leading position reflects the convergence of cultural habits and operational models. Dining frequency is among the highest in Asia, with 39% of the ROC's consumers eating out daily, according to a Rakuten survey (Rakuten Insight, 2022). This demand is reinforced by the city's extensive night market ecosystem, sustaining activity beyond traditional mealtimes. Operators prefer compact, high-throughput formats with extended operating hours and efficient layouts. Outlets like Matsuya in Ximending operate 16 hours a day, with two table turnovers per hour, while Katsutoya, near Taipei Main Station, serves 500–600 customers daily from a 40 m^2 space (Yahoo News, 2019). These conditions contribute to Taipei's top ranking in sales per square foot.

No. 2: London (Int USD69/sqft)

London exemplifies how intense demand and rental pressure drive high spatial productivity. Commercial rents in prime London districts rank among the highest globally, compelling operators to maximize revenue per unit area. For instance, New Bond Street commands rental rates of USD1,462 per square foot per year (Cushman & Wakefield, 2023), making it one of the top five most expensive retail destinations worldwide. These costs create significant rental pressure for food services operators, necessitating maximum space efficiency to maintain viable sales per square foot.

Additionally, London benefits from a diverse resident population and steady inflows of international visitors, forming a broad and resilient customer base. The city ranks among the top three in International Arrivals for 2024 (Euromonitor, 2024).

The combination of exceptionally high rental costs and consistent, diverse demand solidifies London's position near the top of global sales-per-square-foot rankings.

No. 3: Hong Kong (Int USD65/sqft)

Hong Kong ranks among the top cities in sales per square foot due to exceptionally high rents and strong demand. Commercial property costs are among the highest globally, with prime locations, such as the leading street shops in Tsim Sha Tsui, reaching USD1,493 per square foot per year (Cushman & Wakefield, 2023). This incentivizes operators to maximize spatial efficiency, driving high sales per square foot through compact layouts, rapid table turnover, and extended hours.

Hong Kong also benefits from a resilient demand base. With a population density of 7,044 people per square kilometer, it is one of the four most densely populated territories (World Population Review, 2025). As a leading tourist hub, it ranks fourth globally in international arrivals for 2024 (Euromonitor, 2024), ensuring a steady influx of visitors.

High resident density and substantial tourist inflows concentrate demand, sustain footfall during trading hours, and enable higher table turnover. These dynamics of high cost and high demand underpin Hong Kong's strong global productivity rankings.

No. 4: Singapore (Int USD64/sqft)

Singapore ranks among the top cities in sales per square foot, due to its food services concentrated in air-conditioned malls and transport hubs that generate predictable, all-weather footfall during commuter peaks, office lunch hours, and evening leisure cycles, sustaining steady customer flows and high space utilization.

As one of the world's three most densely populated countries (with over 8,600 people per square kilometer), Singapore has a large and concentrated local demand base (World Population Review, 2025). Additionally, it ranked among the top 10 global city destinations in 2024 (Euromonitor, 2024), welcoming 16.5 million international visitors, which further strengthens its dining sector.

Like Hong Kong, this combination of high resident density and strong tourist inflows concentrates demand, sustains footfall across trading hours, and enables higher table turnover, raising sales per square foot.

No. 5: Tokyo (Int USD57/sqft)

Tokyo embodies the characteristics of a city that should rank high in sales per square foot; however, it achieves only a mid-ranking. Prime rents are among the highest globally, with Ginza consistently ranking among Cushman & Wakefield's (2025) top retail locations, compelling food services operators to maximize returns from limited space.

On the demand side, Tokyo ranks among the top three global city destinations in 2024 (Euromonitor, 2024) and boasts a population density of 15,742 people per square kilometer (Wikipedia, 2025a). Outlets, particularly in districts like Ginza and Shibuya, tend to be compact, with small floor plates driving high sales per square foot.

These factors (high rents, strong tourism inflows, dense population, and compact layouts) create conditions conducive to spatial productivity. Nonetheless, Tokyo's ranking suffers due to methodology: sales expressed in PPP reflect the significant depreciation of the yen, which has lost over one-third of its value since 2021 (Reuters, 2024), negatively impacting its global standing.

No. 6: New York City (Int USD45/sqft)

NYC ranks lower in sales per square foot despite its global prominence and high rental costs in core districts. Restaurants in the city are significantly larger than those in many of their global peers, with an average footprint of approximately 2,700 sq ft, according to aggregated data from real estate agents compiled for this benchmarking study. This reflects both the availability of space and consumer preference for expansive, experiential concepts, exemplified by Hudson Yards' Mercado Little Spain, a 37,000 sq ft food hall with 15 stalls and three restaurants (Schulz, 2019). Large-scale formats distribute revenue across broader spaces, reducing sales density even when overall turnover is substantial.

Additionally, variation across neighborhoods, from premium Manhattan corridors to lower-rent, lower-footfall boroughs, depresses the citywide average. These structural characteristics help explain why NYC has lower sales per square foot compared to more compact, high-density cities.

No. 7: Chengdu (Int USD42/sqft)

Chengdu maintains a strong demand for food services, driven by robust domestic consumption and international visitors drawn to its UNESCO-recognized Sichuan cuisine. This demand is primarily focused on hot pot and group dining formats, which require larger spaces for elaborate setups.

The city features expansive retail and dining complexes, such as Sino-Ocean Taikoo Li Chengdu, a 2.86 million sq ft mixed-use development with around 300 shops and restaurants (Wikipedia, 2025c), underscoring the prevalence of large-scale venues. Data from this benchmarking study indicates that the average size of food services establishments in Chengdu is approximately 2,400 sq ft, making it second only to NYC among benchmarked cities; thus, revenue is spread across a larger floor area.

As a result, despite high demand, Chengdu records lower sales per square foot due to traditional dining habits and the larger outlet formats.

No. 8: Seoul (Int USD34/sqft)

Seoul's sales per square foot are influenced by its distinctive dining culture and structural characteristics. Operators prefer larger formats, a strategy supported by research indicating higher closure risks for smaller outlets (Cho et al., 2023). This aligns with the city's concept-driven dining scene, where venues allocate substantial space to ambience and design, as exemplified by experiential destinations like Nudake Haus Nowhere (Ng, 2025).

Seoul's café culture is prominent, with coffee shops comprising approximately 14% of all food services establishments, equating to about one café for every 524 residents (Daxue Consulting, 2022). This draws steady patronage but limits turnover, as customers typically purchase a single beverage and stay for extended periods, thereby reducing sales per square foot.

These factors elucidate Seoul's unique performance on spatial productivity metrics, despite strong overall demand.

COMMON FACTORS LIMITING FOOD SERVICES PRODUCTIVITY ACROSS CITIES

Workforce Shortages and High Turnover

Workforce shortages and high turnover are prevalent in major global cities, undermining food services productivity by reducing capacity, increasing training and recruitment demands, and disrupting operational consistency, ultimately lowering sales output per labor hour.

1. Singapore: The tight labor market stems from restrictions on foreign manpower and a limited local workforce, leading to staffing gaps, particularly in service and kitchen roles. The sector experiences a moderate turnover, with a quarterly average of 2.4% in 2023, translating to an annualized rate of 9.6% (Ministry of Manpower, 2025).

2. London: The UK hospitality industry faces chronic staff shortages, with 107,000 vacancies reported in early 2024 (LinkedIn, 2025). The situation has deteriorated post-Brexit due to the loss of EU workers, leading to increased workloads, burnout, and service quality issues.

3. NYC: NYC reports acute staffing shortages in restaurants and bars, with 87% of establishments lacking at least one staff member (TouchBistro, 2025). The industry also sees an exceptionally high turnover rate of ~75% annually (Fraiche, 2025), particularly among hourly workers in front-of-house and kitchen positions.

4. Tokyo: Japan's aging population and declining birth rates contribute to labor shortages in the food services industry. Efforts are underway to attract foreign talent to address this issue (OECD, 2019).

5. Seoul: As of the second half of last year, the ROK's food services industry reported a labor shortage of 49,312 workers. The government has responded by expanding the roles allowed for E-9 visa holders to include front-of-house positions in restaurants (Korea JoongAng Daily, 2025b).

6. Taipei: The ROC faces a significant labor shortage, with the National Development Council estimating a shortfall of 400,000 workers by 2030 (Taipei Times, 2025). The Ministry of Labor is considering raising the cap on hiring migrant workers to address this issue.

7. Hong Kong: The Hotel, Restaurant, and Institutional sector faces a significant labor shortage, with the workforce contracting by 18% to approximately 249,900 employees (Labour and Welfare Bureau, 2024).

Rising Costs (Rental, Wages, Ingredients, and Utility)

Surging costs are a universal challenge, eroding productivity and profitability in the food services industry. Operators in all eight cities are squeezed by high rents, ingredient price inflation, and rising utility costs, leaving fewer resources to invest in efficiency improvements.

1. London (UK): The UK government raised the National Living Wage by nearly 10% in April 2024, from EUR10.42 to EUR11.44 (approx. USD13.87 to USD15.22) per hour, marking the largest cash increase to date (The National Minimum Wage, 2024). This wage hike significantly impacts hospitality operators, where labor constitutes a substantial portion of operating expenses.

2. Tokyo (Japan): A 43% surge in industrial electricity prices from 2021 to 2022 (Statista, 2022) significantly increased operating costs for food services businesses, forcing many (especially small, independent outlets) to raise menu prices or reduce operating hours to remain viable. Larger chains may absorb these costs, but smaller operators face margin pressure, slower upgrades, and potential closures.

3. Seoul (The ROK): According to survey data from the KOSIS, in 2024, 92.3% of operators reported increased food ingredient prices, 82.6% cited rising rent costs, and 77.5% experienced higher labor expenses (KOSIS, 2025c). These cost pressures significantly impact margins, particularly for small and independent outlets.

4. Singapore: From 2020 to 2023, the cost of goods and materials (COGS) increased by 34.1%, while remuneration costs rose by 26.6% (SingStat, 2023b). This reflects rising ingredient prices and increasing wage demands in a tight labor market.

5. Surging Food Price Inflation in London and NYC:

    a) London
    Between 2019 and 2023, the UK experienced significant food inflation, peaking at 16.4% in October 2022 (Office for National Statistics UK [ONS], 2022), the highest rate since 1977. This surge stemmed from Brexit-induced trade barriers, global supply chain disruptions, and rising energy costs. Research from the London School of Economics estimated that Brexit added approximately EUR6.95 billion to household food bills during this period (Centre for Economic Performance, 2023; ONS, 2023).

    b) New York City
    The NYC metropolitan area experienced an 8.8% increase in food prices in 2022 (Office of the New York State Comptroller, 2025), surpassing historical trends. Nationally, food-at-home prices increased by 11.4%, while food-away-from-home rose by 7.7%. Key drivers included labor shortages, increased wages, and supply chain bottlenecks worsened by the pandemic and the war in Ukraine (USDA Economic Research Service, 2023; Office of the New York State Comptroller, 2025).

6. China (context relevant to Chengdu): In Q4 2024, wages in China's food services sector rose significantly, with average salaries for service workers increasing 15.7% to USD2,806 and for cooks rising 12.3% to USD6,389. Concurrently, commercial rents on 100 key shopping streets averaged RMB 24.37 per square meter per day in the first half of 2024, continuing an upward trend over two consecutive reporting periods (China Index Holdings Limited, 2024).

Evolving Operational Demands

Shifts in consumer preferences, including increased reliance on delivery and takeaway services and growing demand for vegan, plant-based, and sustainable food, have introduced operational complexities that impede productivity in the food services sector. Coordinating multiple service channels, procuring and managing specialized ingredients, implementing distinct preparation processes for dietary requirements, and verifying sustainability credentials increase workflow fragmentation and administrative burdens. These demands divert resources from core service delivery, heighten costs, and, without process or technological adaptations, risk reducing overall operational efficiency.

1. In Singapore, by June 2025, approximately 26.7% of restaurant sales were via online orders (SingStat, 2025) for delivery or pickup, highlighting the significance of digital platforms as a revenue channel.

2. In London, restaurants now account for roughly 21% of all UK delivery occasions, making it one of the most delivery-active cities nationwide (Lumina Intelligence, 2025).

    a) In the ROK, including Seoul, food-related online sales, encompassing food, agricultural products, and food delivery services, accounted for around 30% of total online sales in 2023, marking the largest category for the third consecutive year (USDA, 2025).

Uneven Adoption of Food Services Technology

Disparate technology adoption constrains food services productivity by limiting automation, data integration, and operational efficiency.

1. Smaller operators in markets like Chengdu and Taipei often depend on legacy POS systems or manual processes, hindering integration with delivery platforms and effective data usage for decision-making.

2. In Japan, technology adoption gaps persist; for instance, the cashless payment rate is only 42.8% (Reuters, 2025b), indicating that over half of transactions are cash-based. This suggests that many restaurants, particularly independent or small operations, rely on cash-only or non-digital payment methods, reflecting ongoing digital inertia in parts of Tokyo's food services sector.

3. In the US, only 13% of restaurant operators consider themselves on the cutting edge of technology, while approximately 23% admit to lagging in adopting new tools (National Restaurant Association, 2024). These disparities prevent many businesses from accessing the labor-saving and efficiency benefits enjoyed by more digitally advanced competitors.

4. In Seoul, cashier-less ordering and robotic food preparation are gaining traction, but their impact varies; some customers have rejected robot-cooked meals due to perceived declines in quality. This underscores that successful digital transformation in the food services industry requires not only technology investment but also thoughtful integration, staff training, and adaptation to evolving customer expectations.

BEST PRACTICES AND CASE STUDIES

Robotics and Digital Transformation in Japan and China

Growing Adoption of Robotics (Tokyo)

Japanese restaurants have championed continuous innovation by integrating automation and digital tools into service. This commitment is evident in the increasing use of robotics to address labor shortages and enhance operational efficiency.

According to a DFA Robotics survey conducted in December 2023, the adoption rate of serving robots in Japanese restaurant chains rose to 19.6% in 2023, an increase of 2.5 percentage points from the previous year. Among those who introduced robots, 90.4% expressed satisfaction with the experience, a 12.6-point increase from 2022. This rise in satisfaction indicates that improvements in robot navigation and tray design have positively impacted operations, boosting confidence among operators (DFA Robotics, 2023).

Udon Shokudo (DFA Robotics, 2024), based in Saitama, introduced autonomous serving robots in four pilot restaurants (Figure 3) to address staffing shortages and reduce the physical strain associated with transporting heavy dishes. During peak shifts, robots managed approximately 70% of food deliveries and 30% of clearing tasks, averaging 100 runs a day and covering about 1.5 km per shift, with some outlets reaching up to 2 km. Despite carrying bowls of noodles and broth weighing up to 2.8 kg, no spills were reported. Staff noted a significant reduction in repetitive walking and lifting, allowing more time for guest engagement.

Encouraged by these results, Udon Shokudo plans to expand the program to 20 restaurants, integrating robots with handheld ordering devices and self-checkout kiosks, thereby reinforcing its commitment to automation across both front- and back-of-house operations.

FIGURE 3

AUTONOMOUS SERVING ROBOT AT UDON SHOKUDO.

Source: DFARobotics.

Rise of Smart Kitchen Automation (Chengdu)

Sichuan Panda Cook Technology Co., Limited. (熊喵大师) is a leader in smart kitchen automation in Chengdu, China. Its IoT-enabled robotic cooking systems, now in their fifth generation, combine robotics, IoT, and cloud platforms to standardize Sichuan cooking, enhance efficiency, and reduce labor reliance.

By integrating culinary tradition with automation, Panda Cook demonstrates how digital infrastructure and robotics, such as the intelligent stir-frying robot shown in Figure 4, can transform the food services sector by enabling higher productivity and consistent quality while maintaining regional authenticity. Its cloud-managed IoT kitchen ecosystem, which includes smart appliances like soup makers, temperature-controlled cabinets, and intelligent woks, supports remote monitoring, predictive maintenance, and real-time analytics.

With just one day of training, staff can operate multiple machines, significantly improving labor efficiency. For example, eight woks that previously required eight chefs can now be operated by only three, yielding a 60%+ improvement. This transition lowers costs and enhances role flexibility, enabling all staff to work across responsibilities, making Panda Cook's model scalable and adaptive for modern restaurants.

FIGURE 4

INTELLIGENT STIR-FRYING ROBOT AT SICHUAN PANDA COOK TECHNOLOGY.

Source: Chengdu Learning Trip (Grain, 2025).

Designing Efficient Food Services Operations: Case Studies from NYC and Singapore

Chipotle's Kitchen Workflow Transformation (*NYC*)

NYC's competitive food services market drives operators to refine processes for efficiency, quality, and scalability. Leading brands regularly redesign kitchen workflows, labor deployment, and service models to meet evolving customer expectations. Chipotle exemplifies this approach.

Chipotle is enhancing operations by redesigning kitchen workflows to boost efficiency, consistency, and team member experience. Labor-intensive tasks, such as avocado prep and assembling digital

orders, have been streamlined through automation and improved layouts. For instance, the Autocado machine (Newsroom Chipotle, 2024), shown in Figure 5, handles tasks such as cutting, coring, and peeling avocados, allowing staff to focus on guest interaction and quality control. Digital orders, primarily consisting of bowls and salads, are prepared on a separate makeline (Figure 6), minimizing congestion, improving accuracy, and optimizing workflow across the kitchen.

FIGURE 5

CHIPOTLE'S AUTOCADO.

Source: Chipotle testing avocado processing robot called Autocado (The Robot Report, 2024).

FIGURE 6

CHIPOTLE'S MAKELINE.

Source: Chipotle's New Automated Digital Makeline in Action (QSR magazine, 2024).

Innovative, integrated workflow design helps HarriAnns reduce production time by 40–50% (*Singapore*).

HarriAnns exemplifies how thoughtful process design can boost both customer experience and operational efficiency in food services.

Front-of-House (FOH)

Store layouts are optimized to enhance customer movement and increase revenue. Nonya kueh and coffee are positioned at the entrance for quick purchases, while main dishes, such as curry chicken and fish soup, are kept hot in Bain-Marie systems for rapid service without quality loss. QR code ordering reduces counter queues, supports upselling, and allows staff to engage more with guests. The kitchen occupies only 25% of the floor area, while 75% is dedicated to front-of-house seating and displays, maximizing revenue and maintaining operational efficiency.

Back of House (BOH)

A compact kitchen utilizes a central facility for cooking, with outlets designated for reheating, assembly, and service. Automation tools, such as kueh cutters and plastic pillow wrappers, reduce labor time and enhance quality, while strict SOPs, such as serving the 5th customer within 10 minutes, ensure speed and consistency. These behind-the-scenes efficiencies are crucial in a manpower-constrained market.

Slow Food, Strong Impact: A Taipei Case Study in Sustainable Food Services

The ROC has gained recognition for its commitment to sustainability in urban planning, renewable energy, and waste management. The island nation boasts one of the highest recycling rates globally and fosters a culture of environmental responsibility across both public and private sectors. In this context, the ROC's food services industry has embraced green transformation, with independent operators like Oriental Cuisine Guizhou emerging as early adopters of the sustainable food services model.

Oriental Cuisine Guizhou exemplifies the integration of Slow Food principles (Good, Clean, and Fair) into its daily operations. Mr. Yeh, the owner, prioritizes high-quality, traceable ingredients sourced locally, ensuring food safety and flavor while supporting the ROC's agricultural ecosystem. His environmentally responsible practices include reducing packaging, conserving energy with efficient appliances, and recycling used cooking oil.

Additionally, the restaurant uses handcrafted tableware made by artisans from Hualien and Taitung, reinforcing its commitment to minimal environmental impact. These initiatives lower the restaurant's carbon footprint and resonate with sustainability-conscious customers, earning it official green certification.

The restaurant's practices align with multiple UN Sustainable Development Goals (SDGs) (United Nations, 2025). For instance, local and certified sourcing supports SDG 2 (Zero Hunger) and SDG 15 (Life on Land), while fair wages and ethical partnerships promote SDG 8 (Decent Work and Economic Growth). Waste reduction, energy-saving measures, and low-emission operations contribute to SDG 12 (Responsible Consumption and Production) and SDG 13 (Climate Action). Educating customers on mindful consumption and food waste aligns with SDG 3 (Good Health and Well-being). These efforts illustrate how a small food services operator can contribute significantly to global sustainability through deliberate and locally rooted practices.

STRATEGIC RECOMMENDATIONS

Policy and Institutional Support

Targeted interventions should lower technology adoption barriers, build skills, and optimize space use.

1. Incentivize tech adoption and integration through subsidies, tax relief, and co-funding, prioritizing seamless integration across FOH, BOH, and delivery systems.

2. Link training to productivity gains, offering sector-specific upskilling in POS analytics, kitchen automation, and multi-channel coordination.

3. APO and member governments can pilot co-funded programs to test automation and digital solutions, using results to inform regional policy toolkits and funding frameworks.

Data Infrastructure and Benchmarking

Better data enables evidence-based decision-making and cross-city learning.

1. APO could partner with national productivity bodies to build a shared regional data platform that standardizes metrics and supports evidence-based policymaking.

2. Tie funding to anonymized data sharing to improve sector transparency.

3. Form regional working groups to align productivity indicators and share best practices across cities.

Longitudinal Measurement and Continuous Improvement

Embedding regular measurement supports sustained gains.

1. Track core metrics such as growth rate of sales per employee and sales per square foot.

2. Include enabling indicators like staff turnover, training hours, delivery/takeout revenue share, and rent-to-revenue ratios.

3. Integrate sustainability metrics (e.g., food waste, packaging use) to align productivity with long-term operational resilience.

4. Benchmark every 2–3 years in coordination with industry bodies and policymakers.

CONCLUSION

This benchmarking study highlights that all cities face labor shortages, rising costs, and shifting consumer expectations, but their productivity outcomes vary. Leading cities leverage digital adoption, efficient operational structures, and strong institutional support to achieve higher productivity. Others lag due to fragmented technological uptake and the influence of regulatory and cultural factors. These findings provide a clearer view of the global food services productivity landscape, its strengths, gaps, and opportunities for improvement.

Limitations and Mitigation Steps

Despite rigorous planning and methodological consistency, several limitations are inherent in conducting an international benchmarking study of this scale. The following outlines key challenges and steps taken to mitigate their impact:

Data Availability Across Cities

Limitation

Availability and granularity of food services data varies by city, particularly for metrics such as outlet-level staffing, floor area, and sales turnover. Some sources provide more transparent and current statistics than others.

Mitigation

1. Leveraged official government sources (e.g., economic censuses, labor statistics) wherever available
2. Supplemented gaps with industry reports, commercial databases, and local expert interviews
3. Applied triangulation of multiple sources to validate key data points

Disclaimer

The analysis in this study is subject to data limitations. In several cities, operational metrics, such as establishment-level floor area, were not disclosed by official statistical agencies. For the sales per square foot metric, only revenue data were available, necessitating floor area estimates from commercial property rental platforms. This approach covered approximately 3% of total food services establishments recorded in government statistics, with some cities achieving only 1.5–2% coverage. Thus, these figures serve as indicative benchmarks rather than precise measures.

APPENDICES

Appendix A – Definitions of Sub-sectors

1. *Full-Service Restaurants (FSR)*
   Establishments provide table service and higher-quality food than quick-service outlets. Menus typically include breakfast, lunch, and dinner options, with food preparation involving complex processes requiring advanced culinary skills. FSRs emphasize customer experience, ambience, and menu variety.

2. *Quick-Service Restaurants (QSR) (excluding fast food chains)*
   Outlets offering fast, convenient, and affordable meals, typically featuring limited menus that focus on speed and takeaway convenience. This study excludes multinational fast-food chains to ensure consistent cross-market comparisons. QSRs operate with lean staffing models and streamlined kitchen workflows, making them essential for operational benchmarking.

3. *Cafés/Specialist Coffee Shops*
   Outlets focusing on the sale and service of coffee and related beverages, often complemented by pastries, cakes, sandwiches, and light snacks. Many have expanded into light meals, such as salads and baked goods. These establishments cater to dine-in and takeaway customers, known for modern interiors, branded aesthetics, and emphasis on customer experience.

Appendix B – Consumer Price Index (CPI) Adjustment and PPP Conversion Methodology

CPI Adjustment: Used International Monetary Fund (IMF) and World Bank CPI indices to normalize sales data across different reporting years into 2024 equivalents.

PPP Conversion: Used IMF and World Bank PPP conversion factors to translate local currencies into International Dollars for comparability.

Key Assumptions:

1. CPI applied uniformly across the food services sector for each city.

2. PPP rates treated as static for 2024 (no intra-year volatility).

Formulas

1. Adjusted Sales = Reported Sales × CPI Adjustment Factor

2. Value in International Dollars = Value in Local Currency/ PPP conversion rate

Appendix C – Raw Data Tables

TABLE B1

SALES PER EMPLOYEE

City	Sub-Sector	Annual Sales (local currency)	Monthly Sales (local currency)	Data Year	Year of compa-rison	CPI Adjustment Factor	Monthly Sales - local currency_ CPI adjusted	PPP Conversion (Local/ Intl USD)	Monthly sales- In-tUSD	No. of Employees	Monthly Sales/ Employee (Intl USD)
New York City	Total	32,946,681,000	2,745,556,750.0	2022	2024	1.07	2,943,236,836	1.00	2,943,236,836	303,946	9,683
Seoul	Total	NA	NA	2024	2024	1.00	NA	785.64	NA	NA	9,596
Hong Kong	Total	142,088,000,000	11,840,666,666.7	2023	2024	1.02	12,053,798,667	5.61	2,148,627,213	225,500	9,528
Taipei	Total	228,353,336,000	19,029,444,666.7	2021	2024	1.09	20,704,035,797	13.50	1,534,200,504	161,688	9,489
London	Total	24,307,520,000	2,025,626,666.7	2024	2024	1.00	2,025,626,667	0.67	3,046,055,138	371,440	8,201
Singapore	Total	12,224,300,000	1,018,691,666.7	2023	2024	1.02	1,043,140,267	0.80	1,297,438,143	236,000	5,498
Tokyo	Total	2,774,540,000,000	231,211,666,666.7	2021	2024	1.09	251,327,081,667	93.32	2,693,174,900	500,366	5,382
Chengdu	Total	49,930,000,000	4,160,833,333	2023	2024	1.0022	4,169,958,658	3.54	1,177,954,423	225,204	5,231

TABLE B2

SALES PER SQUARE FOOT

City	Sub-Sector	Monthly Sales (local currency)	Data Year	Year of compar-ison	CPI Adjust-ment Factor	Monthly Sales - local currency_ CPI adjusted	PPP Conversion (Local/ Intl USD)	Avg Floor area of 1 est (sqft)	Monthly Sales/sqft (IntUSD)
New York City	Total	2,745,556,750.0	2022	2024	1.07	2,943,236,836	1.00	2,701	45
Seoul	Total	NA	2024	2024	1.00	NA	785.64	899	34
Hong Kong	Total	11,840,666,666.7	2023	2024	1.02	12,053,798,667	5.61	2,120	65
Taipei	Total	19,029,444,666.7	2021	2024	1.09	20,704,035,797	13.50	1,148	73
London	Total	2,025,626,666.7	2024	2024	1.00	2,025,626,667	0.67	1,730	69
Singapore	Total	1,018,691,666.7	2023	2024	1.02	1,043,140,267	0.80		64
Tokyo	Total	231,211,666,667	2,021	2,024	1.00219	231,718,748,141	93	823	52
Chengdu	Total	4,160,833,333	2,023	2,024	1.00219	4,169,958,658	3.54	2,393	42

Appendix D – Property Listing Websites for Restaurant Floor Area Data

1. Chengdu, China – 58.com

2. Hong Kong – Average sales and restaurant floor area was obtained from the Census and Statistics Department (Hong Kong)

3. London, UK – Appear [here], Rightmove, EG property link, LoopNet, Picture Property Development

4. New York City, USA – Capstone, LoopNet, CREXI

5. Seoul, the ROK – Data on restaurant sales and average floor area were sourced from the Korean Statistical Information Service (KOSIS), the official national statistics portal.

6. Singapore – Aggregated restaurant floor area statistics obtained from the Department of Statistics Singapore (SingStat), the official national statistical agency.

7. Taipei, the ROC – Yesone.com, 591 Commercial Real Estate (ROC)

8. Tokyo, Japan – AtHome, I-tenpo, Inshokuten

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LIST OF FIGURES

ABBREVIATIONS

ADB	Asian Development Bank
AI	Artificial intelligence
APO	Asian Productivity Organization
BCD	Business, Communication & Design
CCP	Career conversion programmes
FSR	Full-Service Restaurants
HMR	Home meal replacements
IoT	Internet of Things
KOSIS	Korean Statistical Information Service
POS	Point-of-sale
PPP	Purchasing Power Parity
QSR	Quick-Service Restaurants
ROC	Republic of China
ROK	Republic of Korea
SDG	Sustainable Development Goals
SME	Small and medium-sized enterprises
TFDA	Taiwan Food and Drug Administration

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