

La ricerca

OPAQUE WINDOWS, HIDDEN PATTERNS? A LAYERED ANALYSIS OF EROTIC-SERVICE TRACES, CORPORATE STRUCTURE AND PROPERTY OWNERSHIP IN CHINESE-LINKED MASSAGE CENTRES IN THE PROVINCE OF MILAN

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Abstract

Research on indoor sexual-service markets faces a measurement problem: venues potentially hosting erotic services often appear as ordinary businesses, while observable traces remain uneven. This study analyses 198 Chinese-linked massage centres in the Province of Milan, classified into three mutually exclusive groups: direct advertising traces, corroborative user-generated traces without direct advertising, and no comparable traces in the selected sources and period. It compares coded indicators across venue presentation, corporate structure and property ownership. Visible venue features provide the clearest signals, while corporate and property data are weaker but useful. The study advances a layered, uncertainty-aware method for analysing semi-hidden markets.

Keywords: prostitution; massage centres; Chinese migration; digital traces; property ownership.

La ricerca sui mercati indoor dei servizi sessuali presenta un problema di misurazione: attività potenzialmente collegate a prestazioni erotiche si presentano come normali esercizi commerciali e lasciano tracce incomplete e disomogenee. Lo studio analizza 198 centri massaggi della Provincia di Milano, definiti operativamente come collegati a soggetti cinesi, e li suddivide in tre gruppi: con tracce pubblicitarie dirette, con soli riscontri prodotti dagli utenti e senza tracce comparabili nelle fonti e nel periodo osservati. I gruppi sono confrontati attraverso indicatori relativi ai locali, alla struttura societaria e alla proprietà immobiliare. Le caratteristiche visibili risultano più indicative dei dati societari e immobiliari.

Parole chiave: prostituzione; centri massaggi; migrazione cinese; tracce digitali; proprietà immobiliare

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1. INTRODUCTION

Indoor sexual-service markets pose a broader problem of social and empirical visibility. Activities involving sexual services, informal labour, exploitation or vulnerability may operate through ordinary commercial venues and leave only partial, uneven and source-dependent traces. This makes them difficult to study without either overlooking hidden activity or over-interpreting ambiguous indicators. The central analytical challenge is therefore not simply to identify suspicious venues, but to understand how semi-hidden markets become observable across different sources, which dimensions remain hidden, and whether distinct layers of evidence reveal consistent patterns. Examining these questions is important for developing methods that preserve uncertainty while allowing systematic comparison across urban venues, organisations and property environments.

The Province of Milan provides a suitable setting in which to examine this problem. It combines a dense personal-service economy with a long-standing Chinese presence and a substantial number of massage centres operating through ordinary commercial forms. This article examines whether Chinese-linked massage centres displaying direct or corroborative traces of erotic services differ from centres without comparable traces across three independently observed domains: venue presentation, formal corporate structure and property ownership. The Milan case is therefore used not only to describe a local market, but to assess how multiple sources can be combined to study partially observable urban service markets without converting ambiguous traces into allegations about individual venues.

Features such as long opening hours, opaque windows or limited online presence remain ambiguous in isolation. They may reflect demand, competition, privacy, discretion, informality or reliance on alternative visibility channels. Their analytical value lies in whether they vary systematically across groups defined through independent online traces. Moreover, illicit activities detected in massage centres should not automatically be treated as evidence of organised criminal involvement. Italian scholarship cautions against interpreting Chinese-linked prostitution through simplified Mafia or Triad frameworks. It instead highlights heterogeneous, often small-scale arrangements involving apartments, massage centres, mobility, co-ethnic relations, informal management and context-dependent forms of coercion or exploitation.¹

Digital advertising, user forums, mapping services, corporate databases and ca-

¹ Stefano Becucci, *La mafia cinese*, RCS Mediagroup, Milano, 2023, consultabile al link

dastral records provide partially overlapping views of venues that are otherwise difficult to study. The analysis, therefore, separates three observational layers: the operating venue, the formal legal entity associated with it and the property environment of the premises. The groups are defined exclusively by traces of online erotic services, and the variables used to compare them – opening times, shopfront characteristics, corporate records, and property ownership – are kept analytically distinct from the classification criteria.²

Specifically, the classification is hierarchical and mutually exclusive. Group 1 comprises venues for which the selected sources contained a direct erotic-service advertising trace associated with the venue; Group 2 comprises venues with corroborative user-generated traces, such as forum discussions or reviews, but no Group 1 trace; and Group 3 comprises venues for which neither type of trace was identified in the specified sources and observation period. Group 3 therefore denotes an absence of observed evidence under the study protocol, not an absence of sexual services.

The overarching question at the basis of the research is the following: To what extent do observable venue-, corporate-, and property-related characteristics differentiate urban indoor service centres displaying traces of erotic-service provision from comparable centres without such traces? The study asks whether the three groups differ in: (i) the opening and closing times, daily opening span, shopfront opacity and dedicated website presence; (ii) the ownership, management, financial profile and risk indicators of associated legal entities; and (iii) the prevalence of observable Chinese-linked ownership within matched property sets. Its contribution is comparative rather than classificatory, since it assesses whether independent venue, corporate and property indicators vary across visibility groups, without treating any single indicator, or combination of indicators, as evidence of illicit conduct within a particular venue.

The findings show that the clearest differences are found at the venue level: Chinese-linked massage centres with explicit sex ads or corroborative user-generated visibility (Groups 1 and 2) close later, remain open longer and show opaque shopfronts more consistently than the ones without those traces (Group 3). The corporate variables examined do not yield robust group differences after multiple-testing correction. Nor is observable Chinese-linked property ownership more

² Polaris, *Hidden in Plain Sight - How Corporate Secrecy Facilitates Human Trafficking in Illicit Massage Parlors*, 2018, consultabile al link

prevalent among trace-positive venues. These findings support a layered analysis of partially observable markets, while limiting the conclusions to group-level associations in the sampled venues.

2. CHINESE-LINKED INDOOR SEXUAL-SERVICE MARKETS: ORGANISATION AND PARTIAL OBSERVABILITY

This section outlines the empirical and conceptual background to the three-layered design. It reviews research on Chinese-linked sexual-service markets in China, diasporic settings and Italy, and explains why venue presentation, formal business records and property environments should be analysed separately. Historically, these services have operated across port districts, rural bars, salons, apartments, massage centres and other indoor venues.³ Prostitution is embedded in migration trajectories, precarious labour, informal services, gendered vulnerabilities and, at times, protection arrangements linked to Triad-like secret societies. Although prostitution, trafficking, smuggling, labour exploitation, migration irregularity and organised crime may overlap, they are not interchangeable. Some women enter sex work through debt, deception or violence; others through constrained routes mediated by kinship or co-ethnic ties.⁴ Voluntary sex work and forced trafficking are better understood as points on a continuum than as separate categories.⁵ When prostitution, trafficking and irregular migration are conflated, women may be classified as offenders, victims or victim-defendants.⁶ These classifications shape official data, intervention priorities and access to support. Ac-

³ Martin Purbrick, *Patriotic Chinese Triads and Secret Societies: From the Imperial Dynasties, to Nationalism, and Communism*, in “Asian Affairs”, 2019, v. 50, n. 3, pp. 305-322, consultabile al link

⁴ Xiaoyi Fang, Xiaoming Li, Hongmei Yang, Yan Hong, Ran Zhao, Baiqing Dong, Wei Liu, Yuejiao Zhou, Shaoling Liang, Bonita Stanton, *Profile of Female Sex Workers in a Chinese County: Does It Differ by Where They Came from and Where They Work?*, in “World Health & Population”, 2007, v. 9, n. 1, pp. 46-64, consultabile al link

⁵ Ko-lin Chin, James O. Finckenauer, *Selling Sex Overseas: Chinese Women and the Realities of Prostitution and Global Sex Trafficking*, New York University Press, New York, 2012, consultabile al link

⁶ Daniele Brigadoi Cologna, *Fenomenologia della prostituzione cinese in Italia nell'attuale scenario migratorio: questioni aperte per la ricerca e per l'intervento sociale*, Università degli Studi dell'Insubria, Varese, 2019, consultabile al link; Jessica Huff, Danielle Wallace, Courtney Riggs, Charles M. Katz, David Choate, *Examining the Association Between Massage Parlors and Neighborhood Crime*, in “Crime & Delinquency”, 2019, v. 65, n. 11, pp. 1537-1569, consultabile al link

cordingly, this study infers neither exploitation from massage centres nor organised crime from Chinese linkage, avoiding untestable claims based on suspicious elements.

2.1. *Sex Markets and Informal Protection in China*

China's sex markets appear to rely on negotiated local arrangements rather than a single stable structure. In Republican-era Shanghai, South China, Hong Kong, Kowloon and Macau, secret societies and Triad-linked groups profited from prostitution, gambling, moneylending, protection and nightlife services, without implying a timeless organised-crime model.⁷ After 1949, Communist authorities suppressed Triad-linked groups. From the late 1970s, market reforms reopened space for informal protection, illicit services and corruption. Research on *baohusan* (protective umbrellas) shows officials protecting gambling, prostitution and front businesses for benefits, suggesting locally contingent protection rather than state-crime fusion or mafia-like hierarchy.⁸ He and Peng show that some Chinese sexual-service venues cluster near police stations, possibly reflecting temporary protection arrangements.⁹ Enforcement changes cause clusters to dissolve and reform.

In some rural settings, women face weaker bargaining power, fewer clients, limited health resources and unstable protection. Ethnographic evidence also traces entry into and persistence in the sex sector. In Shenzhen, only a limited number of cases meet strict trafficking definitions based on force, deception or abuse.¹⁰ Many

⁷ Yiu Kong Chu, *The Triads as Business*, Routledge, London, 2000, consultabile al link; Sonny Shiu-Hing Lo, *Casino Politics, Organized Crime and the Post-Colonial State in Macau*, in "Journal of Contemporary China", 2005, v. 14, n. 43, pp. 207-224, consultabile al link; Sonny Shiu-Hing Lo, *The Politics of Cross-Border Crime in Greater China: Case Studies of Mainland China, Hong Kong, and Macao*, Routledge, London, 2009, consultabile al link; Wei Luo, *Taming Violence: The Shanghai Green Gang and its Self-Legitimation Claims in the Early Twentieth Century*, in "Social Science History", 2023, v. 47, n. 4, pp. 585-608, consultabile al link

⁸ Ko-lin Chin, Roy Godson, *Organized crime and the political-criminal nexus in China*, in "Trends in Organized Crime", 2006, v. 9, pp. 5-44, consultabile al link; Ming Xia, *Assessing and Explaining the Resurgence of China's Criminal Underworld*, in "Global Crime", 2006, v. 7, n. 2, pp. 151-175, consultabile al link; Ming Xia, *Organisational Formations of Organized Crime in China: Perspectives from the State, Markets, and Networks*, in "Journal of Contemporary China", 2008, v. 17, n. 54, pp. 1-23, consultabile al link

⁹ Guojun He, Wei Peng, *Guns and roses: police complicity in organized prostitution*, in "Journal of Public Economics", 2022, v. 207, pp. 104599, consultabile al link

¹⁰ Min Liu, *Migration, Prostitution and Human Trafficking: Chinese Migrant Women in Shenzhen, China*, tesi di dottorato, Rutgers, The State University of New Jersey, Newark, 2010, consultabile al link

women enter through peers or acquaintances amid debt, unemployment or limited opportunities. Exploitation may then arise through dependence, debt, gatekeeping, restricted mobility and vulnerability rather than hierarchical organisations.¹¹ Venue status matters: women in higher-end venues may have more bargaining power than street-based migrants or those in lower-priced salons.¹² Client practices also vary by class and context: sexual services may be routine leisure or part of dining, drinking and elite business sociability.¹³

2.2. Chinese-linked Prostitution in Diasporic Settings

In the diaspora, Chinese-linked prostitution developed under migration controls, exclusion and enclave labour. In the late nineteenth-century United States, restrictions on female migration produced gender imbalance and reinforced racialised stereotypes linking Chinese women to vice and sexual immorality.¹⁴ This shaped the policing of vulnerable Chinese women. Limited access to citizenship, employment and legal protection encouraged support through kinship, hometown ties and associations. These networks mainly served cultural, economic and mutual-aid functions, though some entered illicit markets or informal protection arrangements, occasionally alongside local youth gangs.¹⁵

¹¹ Yan Hong, Chen Zhang, Xiaoming Li, Yuejiao Zhou, Weigui Guo, *Female Sex Workers and Their Gatekeepers in China: Implications for HIV/STI Prevention*, in “Qualitative Health Research”, 2014, v. 24, n. 10, pp. 1431-1439, consultabile al link

¹² Guomei Xia, Xiushi Yang, *Risky Sexual Behavior among Female Entertainment Workers in China: Implications for HIV/STD Prevention Intervention*, in “AIDS Education and Prevention”, 2005, v. 17, n. 2, pp. 143-156, consultabile al link; Youchun Zhang, Jane D. Brown, Kathryn E. Muessig, Xianxiang Feng, Wenzhen He, *Sexual Health Knowledge and Health Practices of Female Sex Workers in Linczhou, China, Differ by Size of Venue*, in “AIDS and Behavior”, 2014, v. 18, n. 2, pp. 162-170, consultabile al link

¹³ Sandra Teresa Hyde, *Selling sex and sidestepping the state: prostitutes, condoms, and HIV/AIDS prevention in Southwest China*, in “East Asia”, 2000, v. 18, n. 4, pp. 108-136, consultabile al link

¹⁴ Stefano Becucci, *La mafia cinese*, RCS Mediagroup, Milano, 2023, consultabile al link; Erika Lee, *The Chinese Exclusion Example: Race, Immigration, and American Gatekeeping, 1882-1924*, in “Journal of American Ethnic History”, 2002, v. 21, n. 3, pp. 36-62, consultabile al link; Xinyao Zhang, *The Historical Significance of the 1882 Chinese Exclusion Act: The Impacts on Chinese Immigrants in the United States*, in *Proceedings of the 2022 8th International Conference on Humanities and Social Science Research (ICHSSR 2022)*, Atlantis Press, Dordrecht, 2022, pp. 1737-1741, consultabile al link

¹⁵ Stefano Becucci, *Oltre gli stereotipi: la ricerca-azione di Renzo Rastrelli sull'immigrazione cinese in Italia*, Firenze University Press, Firenze, 2018, consultabile al link; Ko-lin Chin, Roy Godson, *Organized crime and the political-criminal nexus in China*, in “Trends in Organized Crime”, 2006, v. 9, pp. 5-44, consultabile al link; Karen A. Joe, *The New Criminal Conspiracy? Asian Gangs and Organized Crime in San Francisco*, in “Journal of Research in Crime and Delinquency”, 1994, v. 31, n. 4, pp. 390-415,

Illicit parlours may cluster in immigrant enclaves and commercial districts shaped by labour supply, client demand and neighbourhood opportunities.¹⁶ Wellness fronts may coexist with sexual services, vulnerability and informal control.¹⁷ Control is often situational rather than openly violent. Women may face recruitment debt, language barriers, dependence on intermediaries, immigration threats, documentation checks, isolation or mobility constraints.¹⁸ Yiu shows how framing massage labour as healing work can protect dignity, reduce stigma and blur the line between licit and illicit labour.¹⁹

Digital platforms add ambiguity by facilitating recruitment, supervision, advertising and client contact while leaving analysable traces. Li shows that WeChat may serve as recruitment infrastructure or a control system.²⁰ Digital traces do not simply reveal hidden markets; they may also support operations and concealment while making some activities observable. Community-facing spaces such as shops, salons and associations may facilitate these activities, while Chinese-linked networks may use transnational digital platforms for recruitment, advertising or supervision.²¹

2.3. *Chinese-linked Prostitution in Italy*

Italian scholarship cautions against applying a simplified mafia model to Chinese-linked prostitution. Instead, it points to adaptive service networks, relational arrangements, small-group organisation and situational coercion.²² The Italian

consultabile al link

¹⁶ John J. Chin, Lois M. Takahashi, Douglas J. Wiebe, *Where and Why Do Illicit Businesses Cluster? Comparing Sexually Oriented Massage Parlors in Los Angeles County and New York City*, in "Journal of Planning Education and Research", 2023, v. 43, n. 1, pp. 106-121, consultabile al link

¹⁷ Bombini, *Centri massaggio e prostituzione cinese mascherata: una ricerca esplorativa nel Comune di Milano*, tesi in Scienze Sociali Applicate, Università Cattolica del Sacro Cuore, Milano, 2012

¹⁸ Annelies L. Daalder, *Prostitution in the Netherlands in 2014*, Wetenschappelijk Onderzoek- en Documentatiecentrum, The Hague, 2015, pp. 1-39, consultabile al link

¹⁹ Wei Si Nic Yiu, *Health work, not sex work: Situating Asian massage work as healing labour*, in "Feminist Review", 2025, v. 141, n. 1, pp. 34-43, consultabile al link

²⁰ Angela Li, *Unseen and Unforgiving: Massage Brothels and the Sex Trafficking of Chinese Women*, in "Aleph UCLA Undergraduate Research Journal for the Humanities and Social Sciences", 2020, v. 17, pp. 139-151, consultabile al link

²¹ Annelies L. Daalder, *Prostitution in the Netherlands in 2014*, Wetenschappelijk Onderzoek- en Documentatiecentrum, The Hague, 2015, pp. 1-39, consultabile al link

²² Stefano Becucci, Emanuela Garosi, *Corpi globali: la prostituzione in Italia*, Firenze University

market appears segmented into high-end services for wealthy Chinese clients, apartment-based circuits for co-nationals, massage centres serving broader clientele and a smaller street-based segment.²³ Some women retain most of the service price, while others face confinement, restrictions or manipulation.²⁴ Mobility across cities, apartments and parlours helps sustain demand and reduce exposure to enforcement. Geo-dialectal ties based on origin, dialect and intra-community trust shape recruitment and movement.²⁵ Prostitution may also emerge in small, fluid arrangements following underpaid enclave work, injury or irregular status.²⁶ Since the 2010s, attention has focused on migrants from North-East China, especially in street prostitution, where women may have weaker community support and greater exposure to debt, relocation or exploitation.²⁷ Milan is especially relevant. Qualitative research on migrant street prostitution during COVID-19 shows how agency and exploitation may coexist, supporting a layered view of vulnerability rather than a simple victimisation–autonomy divide.²⁸ In 2012, Bombini mapped 232 massage centres in Milan, including 84 Chinese-run businesses, highlighting wellness fronts, peripheral locations and possible ‘extra services’ generating shadow-economy revenues.²⁹ This makes Milan a suitable setting for

Press, Firenze, 2008, consultabile al link

²³ Stefano Becucci, Francesco Carchedi, *Mafie straniere in Italia: come operano, come si contrastano*, FrancoAngeli, Milano, 2016, consultabile al link; Stefano Becucci, Emanuela Garosi, *Corpi globali: la prostituzione in Italia*, Firenze University Press, Firenze, 2008, consultabile al link

²⁴ Stefano Becucci, *La criminalità cinese in Italia. Bande e organizzazioni mafiose*, in “Mondo Cinese. Rivista di Studi sulla Cina contemporanea”, 2017, v. 163, n. 3, pp. 45-57, consultabile al link

²⁵ Stefano Becucci, *La criminalità organizzata cinese in Italia: fenomeno mafioso o bande criminali?*, in “Meridiana”, 2002, n. 43, pp. 99-114, consultabile al link; Giulia Berti, *Lo sfruttamento lavorativo nelle aziende cinesi del distretto tessile pratese*, Altro Diritto - Università di Firenze, Firenze, 2020, consultabile al link

²⁶ Maria Bristot, *Dreaming the “heaven”, landing in the “hell”: transnational analysis of Chinese middle-aged women who sell sex in Italy*, tesi di dottorato, The University of Hong Kong, Hong Kong, 2018, consultabile al link; Antonella Ceccagno, *The Hidden Crisis: the Prato Industrial District and the Once Thriving Chinese Garment Industry*, in “Revue Européenne des Migrations Internationales”, 2012, v. 28, n. 4, pp. 43-65, consultabile al link

²⁷ Thomas Aureliani, *La criminalità cinese a Milano, il caso di via Paolo Sarpi*, tesi in Scienze Politiche, Università degli Studi di Milano, Milano, 2011, consultabile al link; Stefano Becucci, *Oltre gli stereotipi: la ricerca-azione di Renzo Rastrelli sull’immigrazione cinese in Italia*, Firenze University Press, Firenze, 2018, consultabile al link

²⁸ Federica Cabras, Ombretta Ingrassi, *Female Migrant Street Prostitution during COVID-19 in Milan. A Qualitative Study on How Sex Workers Coped with the Challenges of the Pandemic*, in “Sociologica”, 2022, v. 16, n. 1, pp. 95-122, consultabile al link

²⁹ Claudia Bombini, *Centri massaggio e prostituzione cinese mascherata: una ricerca esplorativa nel Comune*

examining whether massage centres associated with erotic-service traces differ in public visibility, formal business structure and property environment.

2.4. From Hidden Population to Partial Observability

Early research on Chinese-linked indoor sex markets relied on ethnography, case studies, institutional reports and investigative accounts. These approaches offer contextual depth and limit over-interpretation, but access to sex workers may be difficult and fieldwork can raise risks for stigmatized or vulnerable populations. Researchers therefore increasingly use public traces, including advertisements, forums, reviews, opening hours, licences, registers, platform listings and geolocations. These data cannot replace victim-centred or ethnographic research or constitute legal evidence, but they can reveal patterns, support group comparisons and make uncertainty explicit at scale.³⁰ Recent methodological work uses digital and open-source traces to analyse semi-hidden sex markets.

Diaz and Panangadan use online reviews to identify businesses potentially linked to trafficking.³¹ Tobey et al. develop interpretable models to detect trafficking-related signals in illicit massage businesses.³² These approaches move beyond anecdotes towards systematic pattern detection, though they support triage and outreach rather than determine victimisation or criminality. Simonson classifies sex-industry Instagram posts using semi-supervised natural language processing (NLP) while avoiding claims about consent or trafficking.³³ Carter et al. show that topic modelling can identify themes such as pricing, ethnicity, legality and preferences in online forums, while warning that coded and gendered language requires cau-

di Milano, tesi in Scienze Sociali Applicate, Università Cattolica del Sacro Cuore, Milano, 2012

³⁰ Artur Dubrawski, Kyle Miller, Matthew Barnes, Benedikt Boecking, Emily Kennedy, *Leveraging Publicly Available Data to Discern Patterns of Human-Trafficking Activity*, in “Journal of Human Trafficking”, 2015, v. 1, n. 1, pp. 65-85, consultabile al link

³¹ Maria Diaz, Anand Panangadan, *Natural Language-based Integration of Online Review Datasets for Identification of Sex Trafficking Businesses*, in *2020 IEEE 21st International Conference on Information Reuse and Integration for Data Science (IRI)*, IEEE, Piscataway, 2020, pp. 259-264, consultabile al link

³² Margaret Tobey, Ruoting Li, Osman Y. Özalpın, Maria E. Mayorga, Sherrie Caltagirone, *Interpretable models for the automated detection of human trafficking in illicit massage businesses*, in “IISE Transactions”, 2024, v. 56, n. 3, pp. 311-324, consultabile al link

³³ Ellie Simonson, *Semi-Supervised Classification of Social Media Posts: Identifying Sex-Industry Posts to Enable Better Support for Those Experiencing Sex-Trafficking*, tesi di Master of Engineering in Electrical Engineering and Computer Science, Massachusetts Institute of Technology, Cambridge, 2021, consultabile al link

tion.³⁴ Algorithms cannot resolve hidden-market evidentiary problems, but structured analyses can organise noisy traces, identify patterns and clarify uncertainty.

2.5. *From the Literature to the Analytical Framework*

Existing studies rarely combine venue presentation, corporate records and property ownership in one comparative design. This article addresses that gap by comparing venues with and without observable erotic-service traces across three connected layers, without identifying victims, establishing trafficking or classifying individual workers. Venue-level visibility captures partial public traces such as on-line references, opening hours and spatial presentation. Business records identify legal entities, owners or managers, but not practical control, labour relations or informal arrangements. The property layer captures the premises and urban property markets in which venues operate. Separating these layers allows comparison without treating any single layer as proof of hidden activity.

3. RESEARCH QUESTIONS

The overarching question is operationalized through three empirical questions, each corresponding to one layer: the operating venue, the formal legal entity and the property environment. This reflects the fact that Chinese-linked massage centres cannot be observed through a single source or indicator. A centre may show erotic-service traces at venue level while being registered as an ordinary business. Conversely, a legal entity may have Chinese-linked ownership or management while being not related to any erotic-service activity. Similarly, the property owner may be unrelated to the business operating in the premises.

The first question concerns venue-level visibility. It examines whether centres associated with direct or corroborative traces of erotic-service provision differ from centres without comparable traces in terms of opening and closing hours, daily opening duration, window opacity and dedicated web presence. These features are not treated as standalone proxies for hidden activity. Their relevance lies in whether they vary systematically across groups defined through independent online traces rather than through the specific venue-level indicators being tested.

³⁴ Pelham Carter, Matt Gee, Hollie McIlhone, Harkeeret Lally, Robert Lawson, *Comparing manual and computational approaches to theme identification in online forums: a case study of a sex work special interest community*, in “Methods in Psychology”, 2021, v. 5, pp. 100065, consultabile al link

The second question concerns formal corporate structure. It examines whether the legal entities linked to these centres differ across groups in terms of recorded legal form, ownership, shareholders, directors, management, nationality composition, financial profiles or corporate-risk indicators. Corporate records capture formal legal positions rather than practical control, labour relations or informal arrangements; the question is whether any formal differences are nevertheless observable across groups.

The third question concerns the property environment. It examines whether premises hosting centres associated with direct or corroborative erotic-service traces show observable Chinese-linked property ownership more often than premises hosting centres without comparable traces. Property owners may be unrelated to the business, and property records cannot capture rental contracts, subletting arrangements, proxy ownership or informal access to premises. The aim is not to infer property-level responsibility, but to assess whether the venues appear embedded in co-ethnic property environments or ordinary urban property markets. Together, these questions translate the overarching comparative inquiry into an empirical design based on three distinct but connected layers: the operating venue, the formal legal entity linked to the centre, and the property environment of the premises in which it operates. No single layer is expected to reveal hidden activity fully. Each layer addresses a different dimension of partial observability. Table 1 summarises the research questions, units of analysis and main evidence.

Table 1 – Research questions and analytical levels

<i>Research question</i>	<i>Main unit</i>	<i>Main evidence</i>
RQ1 – Venue Visibility Do Chinese-linked massage centres associated with direct or corroborative traces of erotic-service provision differ from centres without comparable traces in terms of opening and closing hours, daily opening duration, window opacity and dedicated web presence?	Operating venue	Google Maps, Street View, venue-level visual checks, opening-hours information and online traces.
RQ2 – Formal Corporate Structure Do the legal entities linked to these massage centres differ across groups in terms of recorded legal form, ownership, shareholders, directors, management, financial profiles or corporate-risk indicators?	Legal business entity	Moody's Orbis business-register and corporate data.
RQ3 – Property Environment Do premises hosting centres associated with direct or corroborative erotic-service traces show observable Chinese-linked property ownership more often than premises hosting centres without comparable traces?	Plausible cadastral-property set	Genius Property cadastral and ownership information matched at address/floor level where possible.

4. METHODS

4.1. Research Design

This article adopts an observational comparative design combining open-source searches, business-register data and cadastral ownership information. It compares Chinese-linked massage centres in the Province of Milan according to different types of observable erotic-service traces. The design does not determine whether individual centres are involved in prostitution, exploitation or trafficking. Online advertisements, forum discussions and user reviews define analytical groups; venue, corporate and property data are then used to compare those groups across distinct layers of observation.

The design is conservative in two respects. First, public traces are treated as indicators of visibility, not as legal facts. Second, business-register and cadastral data are used to describe formal and infrastructural conditions, not to infer unobserved control. The unit of analysis therefore varies by layer: the operating venue for venue-level analysis, the formal legal entity for corporate analysis, and the property environment of the premises for cadastral analysis. A single centre may thus correspond to a shopfront or apartment, a registered business entity and one or more cadastral units.

4.2. Data Sources

The analysis combines four data sources. First, Moody's Orbis identified massage and personal-service entities in the Province of Milan and provided legal, financial, corporate, risk and ownership-complexity data. Second, open-source searches verified operating massage centres and classified them using business names, addresses, Google Maps, websites, reviews, erotic-service platforms, and client forums. This preserved the administrative basis of the sample rather than creating an unconstrained venue universe. Third, Google Maps and Street View provided opening hours, window opacity, and website presence, indicating venue presentation rather than prostitution or exploitation. Fourth, Genius Property data captured property environments and observable Chinese-linked ownership within matched address, floor, or cadastral sets. Because exact sub-unit attribution was sometimes impossible, results are interpreted cautiously.

4.3. Sample Construction

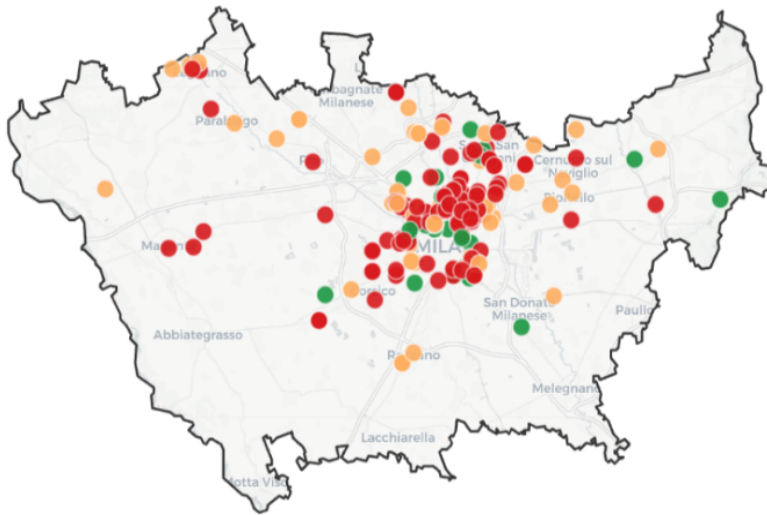
The starting point was the list of active legal entities in the Province of Milan registered under ATECO codes 96.23 and 96.99, both compatible with personal-service activities. Code 96.23 captures massage-related activities, while 96.99 includes centres registered outside the specific category. The extract was obtained from Moody's Orbis on 17 November 2025. Chinese-linked entities were identified through observable criteria: references to Chinese massage, such as Tuina, in names or public presentation; retrievable Chinese-linked individuals; or explicit public association with Chinese massage. 'Chinese-linked' is operational and does not imply Chinese ownership, control or management in every case.

Table 2 – Sample construction and exclusions

<i>Stage</i>	<i>n</i>	<i>% of previous relevant stage</i>	<i>Comment</i>
Businesses in the ATECO 96.23 / 96.99 universe	2,785	—	Administrative starting universe
Chinese-linked businesses in scope	260	9.3% of universe	Cases retained after Chinese attribution
Excluded: other registered activity	30	11.5% of Chinese-linked cases	Formally in scope, but not actually massage centres
Excluded: not operational or not found	32	12.3% of Chinese-linked cases	Inactive or no longer verifiable at the recorded address
Final sample	198	76.2% of Chinese-linked cases	Operational Chinese massage centres included in the group classification

Entities were excluded if inactive, unverified at the recorded address or unrelated to massage centres despite registration in the selected categories (Table 2). The final sample comprises 198 operational Chinese-linked massage centres in the Province of Milan (Map 1), classified into three groups: direct erotic-service advertising, corroborative user-generated indications without direct advertising, and no comparable traces during the observation period (Tables 3 and 4). Group 1

includes centres advertised on explicit erotic-service or erotic/ambiguous massage platforms (109). Group 2 includes centres without equivalent self-advertising but mentioned in forums or reviews (58). Group 3 includes centres with no comparable observed traces (31) and serves only as a comparison group, not proof that sexual services are absent.



Map 1 – Operational Chinese-linked massage centres in the Province of Milan by visibility group

Legend:

- Group 1 (Red) - Direct erotic-service advertising
- Group 2 (Yellow) - Corroborative user-generated indications
- Group 3 (Green) - No comparable observable traces

Source: authors' elaboration

Table 3 – Online sources and coding rules used to construct the visibility groups

<i>Source</i>	<i>Source type</i>	<i>Main analytic function</i>	<i>Evidence extracted</i>	<i>Role in group definition</i>
Escort Advisor	Explicit advertising platform	Identify direct erotic-service promotion by the venue/operator	Explicit erotic-service advertising	Group 1
Happy Ending 24	Explicit advertising platform	Identify direct erotic-service promotion by the venue/operator	Explicit erotic-service advertising	Group 1
Tantralux	Explicit advertising platform	Identify direct erotic-service promotion by the venue/operator	Explicit erotic-service advertising	Group 1
Mosca Rossa	Explicit advertising platform	Identify direct erotic-service promotion by the venue/operator	Explicit erotic-service advertising	Group 1
Bakeka	Explicit advertising platform	Identify direct erotic-service promotion by the venue/operator	Explicit erotic-service advertising	Group 1
Massaggi Emozionali	Erotic massage advertising platform	Identify centres advertised in sexually connoted massage environments	Erotic or ambiguous massage advertising	Group 1 or Group 2, depending on corroboration

<i>Source</i>	<i>Source type</i>	<i>Main analytic function</i>	<i>Evidence extracted</i>	<i>Role in group definition</i>
Massaggio Happy Ending Forum Free (MHE)	Specialist forum / corroborative source	Identify user-generated reports suggestive of erotic-service provision	Forum discussion and user reports	Group 2
Google Maps reviews	Corroborative review source	Identify user-generated indications outside explicit advertising platforms	User reviews suggestive of erotic services	Group 2

Table 4 – Operational definitions of the visibility groups and planned comparisons

<i>Group</i>	<i>Definition</i>	<i>Main basis for classification</i>	<i>Role in comparative analysis</i>	<i>n</i>
Group 1	Operational Chinese massage centres with direct evidence of erotic-service promotion	Direct self-promotion by the venue or its operator on erotic-service advertising platforms	Matched against Group 3	109
Group 2	Operational Chinese massage centres with corroborative indications of erotic-service provision	User-generated discussions, reviews, or other corroborative online elements, without equivalent direct self-advertising on explicit erotic-service platforms	Matched against Group 3	58
Group 3	Operational Chinese massage centres with no specific observable indications of erotic-service provision during the observation period	Absence of the evidentiary conditions used for Groups 1 and 2	Comparison group	31

4.4. *Variables*

Venue-level variables included opening and closing times, daily opening span, window opacity and dedicated website presence. Times were imported from dedicated fields, converted into minutes after midnight and standardised to account for Excel's fractional-day storage. Daily opening span was calculated separately for each observation as the difference between closing and opening time, with adjustment for schedules crossing midnight. Clock times and daily opening spans are reported in HH:MM format. Corporate variables included legal form, size, status, NACE category, assets, revenue, employees, beneficial owners, shareholders, directors and managers.

Property variables capture whether Chinese-linked ownership is observable within the property environment of each venue. The property layer is not treated as a precise one-to-one attribution in every case. The analysis distinguishes between cases where Chinese-linked ownership appears within the matched property set and cases where no such ownership is observable in that set. Variables used to define the groups, such as direct erotic-service advertising traces or user-review traces, are not included as outcomes in the inferential tests. Testing them against group membership would be tautological, since they contribute to the classification itself.

4.5. *Statistical Strategy*

The statistical analysis follows the layered structure of the research questions. The primary contrast compares Groups 1 and 2 against Group 3, testing whether centres with any observable erotic-service trace differ from centres without comparable traces. A secondary three-group comparison distinguishes Group 1, Group 2 and Group 3, allowing the analysis to assess whether direct advertising traces and user-generated indications correspond to different venue, corporate or property profiles.

Continuous, count and ordinal variables were analysed with rank-based non-parametric tests: Kruskal–Wallis for three-group comparisons and Wilcoxon rank-sum for the primary binary comparison. These were preferred because several variables were skewed, sparse, ordinal or count-based, and group sizes were unequal. Categorical variables were analysed with Fisher's exact tests, preferred to chi-square tests because several tables had small expected counts. Simulated p-values were used for larger tables. Effect sizes accompanied p-values: epsilon-squared for Kruskal–Wallis, rank-biserial correlation for Wilcoxon and Cramer's V for Fisher

tests.

As a multivariable robustness check, parsimonious multinomial logistic regression models were estimated to distinguish among the three centre groups, using G3 as the reference category. The purpose of these models was not causal identification or predictive classification, but to assess whether the main descriptive associations observed in the non-parametric comparisons remained visible within a regression framework. Variables used to define the groups were excluded from the regression models to avoid tautological prediction.

Given the small and unequal group sizes, sparse cells and skewed distributions, the models were deliberately kept parsimonious. As closing time and daily opening span are mechanically related, these variables were entered in separate specifications. The primary models included one standardised temporal predictor at a time. Additional models including window opacity and dedicated website presence were treated as sensitivity analyses because these variables showed sparse or near-separated distributions. Results are reported as relative risk ratios comparing G1 and G2 with G3. Continuous predictors were standardised to ease interpretation.

Considering the number of variables tested, p-values were corrected within variable families using the Benjamini-Hochberg false-discovery-rate procedure. Pair-wise post-hoc comparisons, where used, were treated as secondary and adjusted using Holm correction. The analysis therefore gives priority to patterns that are substantively interpretable, robust after correction and consistent across the primary and secondary comparisons (Table 5).

Table 5 - Statistical choices and rationale

<i>Issue</i>	<i>Choice</i>	<i>Rationale</i>
Continuous/count/score variables	Kruskal-Wallis; Wilcoxon rank-sum	Robust to skewed distributions, small cell sizes and non-normal financial/count variables.
Categorical variables	Fisher exact test	Avoids reliance on large-sample chi-square assumptions where cells are sparse.

<i>Issue</i>	<i>Choice</i>	<i>Rationale</i>
Multivariable robustness check	Multinomial logistic regression models	Assesses whether selected venue-level associations remain directionally consistent when considered jointly; not used for causal inference or prediction.
Multiple testing	Benjamini-Hochberg within variable families; Holm for pairwise contrasts	Reduces false-positive inflation while preserving exploratory interpretability.
Missingness	Fisher exact test on missingness indicators	Assesses whether data availability differs by group; does not prove missing-at-random assumptions.
Group-definition variables	Reported but not tested as outcomes	Avoids tautological inference for sex-advertising and sex-review indicators.

Note. Statistical evidence is interpreted alongside effect sizes and substantive direction in the accompanying text. No single p-value is treated as proof of illicit conduct.

4.6. *Treatment of Missing Data*

Missing values were handled through a variable-specific complete-case approach. For each test, observations with missing values on the tested variable were excluded from that specific test, while remaining available for other analyses. This avoids discarding observations that are valid for other parts of the study. Missingness was also analysed separately. For each variable, a binary missingness indicator was constructed and tested against group membership. This diagnostic does not establish that data are missing at random; it only assesses whether missingness is associated with the analytical grouping.

Complete opening and closing times were available for 184 of the 198 observations. Temporal information was missing for only 1 of 109 observations in G1 and 3 of 58 observations in G2, but for 10 of 31 observations in G3. As a result, the temporal comparisons involving G3 are based on 21 complete observations, corresponding to approximately two-thirds of that group. These findings should therefore be interpreted cautiously, as the observed G3 temporal profile may re-

flect the more publicly visible subset of centres rather than the full group. Where missingness differed across groups, complete-case results were interpreted cautiously and missingness was treated as substantively informative. This is especially relevant for venue-level variables, since in hidden or semi-hidden markets missingness may reflect observability rather than a technical data problem. A venue may lack visible opening hours or Street View information because it is less publicly exposed, recently opened, located inside a building or not actively represented online. The analysis therefore distinguishes observed features from the visibility conditions that make them observable.

4.7. Ethical and Interpretative Boundaries

The analysis does not identify, contact or profile sex workers, clients or presumed victims. It uses public and administrative traces to compare observable infrastructures, not to make allegations. Results indicate group-level patterns, not individual illegality. Groups 1 and 2 mark observable erotic-service traces; Group 3 marks their absence within the selected sources and observation period. None of these groups should be equated with legal status, victimisation, exploitation or organised crime.

The design's strength lies in triangulation: comparing visible, corporate and property-level information while preserving uncertainty. Its contribution is not to automate suspicion, but to compare partial traces systematically. By separating venue, entity and property layers, the analysis avoids conflating visual opacity, Chinese linkage, formal business ownership and property ownership. It tests whether observable traces correspond to broader organisational or infrastructural differences without treating any single layer as proof of hidden activity.

5. RESULTS AND DISCUSSION

The empirical analysis assesses whether Chinese-linked massage centres associated with different types of observable erotic-service traces differ across three layers: operating venue, legal entity and property environment. Results are interpreted as group-level comparisons of observable characteristics. The findings point to a layered and asymmetric pattern. Venue-level features provide the clearest group-level differences, especially in relation to closing hours, daily opening span and window opacity. These differences are statistically robust but remain contextual and unsuitable as standalone indicators.

By contrast, corporate and financial data do not reveal robust formal differences distinguishing the groups. The property layer further qualifies the picture: most venues appear to rely on ordinary urban property environments rather than on systematic property ownership by China-born individuals, although this does not exclude second-generation ownership, proxy ownership or informal arrangements. Taken together, the results suggest that visible indicators are informative when read comparatively, while business-register and property data mainly clarify the formal and infrastructural conditions under which these venues operate.

5.1. *Venue-Level Visibility: The Clearest Group-Level Differences*

The first research question compares the three groups of massage centres in relation to selected venue-level characteristics: dedicated website presence, reported opening and closing hours, daily opening span, and shopfront or window configuration. These indicators do not merely describe generic sectoral features. Some vary systematically across groups. Centres associated with direct or corroborative erotic-service traces tend to close later and remain open for longer daily periods than centres for which no comparable traces were observed. Their value is therefore comparative and contextual: they become meaningful only when assessed across groups defined through independent online traces.

Table 6 - Venue-level visible characteristics by group

Group	n	Opening time median/mean	Closing time median/mean	Opening span median/mean	Tinted/ closed windows	Dedicated website
G1	109	09:00 / 09:16	23:00 / 22:56	14:00 / 13:40	109/109 (100.0%)	0/109 (0.0%)
G2	58	10:00 / 09:46	23:00 / 22:59	13:30 / 13:14	58/58 (100.0%)	0/58 (0.0%)
G3	31	10:00 / 09:37	22:00 / 21:44	12:00 / 12:07	24/28 (85.7%)	3/31 (9.7%)

Note. The column n reports the total number of observations in each group. Opening time, closing time and daily opening span statistics were calculated using observations with complete temporal information: 108 observations in G1, 55 in G2 and 21 in G3. Medians and means are reported in HH:MM format. Daily opening spans are expressed as hours and minutes.

The sample includes 198 massage centres: 109 in Group 1, 58 in Group 2 and 31 in Group 3. Complete opening and closing times were available for 184 of the 198 observations: 108 in G1, 55 in G2 and 21 in G3. Temporal missingness was therefore concentrated in G3. Window-configuration data are available for 195 of 198 cases, while dedicated websites were rare, appearing in only three cases, all in Group 3 (Table 6). The strongest differences concern closing hour and daily opening span. Groups 1 and 2 both had a median closing time of 23:00, compared with 22:00 in Group 3. Median daily opening span was 14 hours in G1, 13 hours and 30 minutes in G2 and 12 hours in G3. Both differences remain robust after Benjamini-Hochberg correction.

Table 7 - Primary venue-level tests: Groups 1-2 versus Group 3

<i>Variable</i>	<i>Comparison</i>	<i>Test</i>	<i>p</i>	<i>adjusted p</i>	<i>effect size</i>
Closing time	G1+G2 vs G3	Wilcoxon rank-sum	<0.001	<0.001	0.578
Daily opening span	G1+G2 vs G3	Wilcoxon rank-sum	<0.001	<0.001	0.603
Opening time	G1+G2 vs G3	Wilcoxon rank-sum	0.751	0.751	-0.039
Tinted/closed windows	G1+G2 vs G3	Fisher exact	<0.001	<0.001	0.353
Dedicated website	G1+G2 vs G3	Fisher exact	0.004	0.004	0.288

Note. Effect size is rank-biserial correlation for Wilcoxon tests and Cramer's V for Fisher exact tests. Values are interpreted as exploratory associations, not legal or causal evidence.

The multinomial robustness checks were directionally consistent with the non-parametric results (Table 8). Using G3 as the reference category, a one-standard-deviation increase in closing time was associated with a higher relative risk of belonging to G1 (RRR = 3.26, 95% CI 1.87–5.66, $p < 0.001$) and G2 (RRR = 3.48, 95% CI 1.92–6.30, $p < 0.001$). In a separate specification, a one-standard-deviation increase in daily opening span was associated with a higher relative risk of belonging to G1 (RRR = 5.99, 95% CI 2.70–13.26, $p < 0.001$) and G2 (RRR = 4.28, 95% CI 1.90–9.65, $p < 0.001$).

Extended sensitivity analyses (Supplementary Table S1, Appendix) yielded the same substantive conclusions. After adjustment for window opacity and dedicated website presence, closing time remained positively associated with membership in G1 (RRR = 2.38, 95% CI 1.34–4.21, $p = 0.003$) and G2 (RRR = 2.54, 95% CI 1.38–4.68, $p = 0.003$) relative to G3. Daily opening span also remained positively associated with G1 (RRR = 4.37, 95% CI 1.92–9.98, $p < 0.001$) and G2 (RRR = 3.13, 95% CI 1.35–7.28, $p = 0.008$). Estimates for window opacity and dedicated website presence had wide confidence intervals because of sparse and near-separated data and are therefore interpreted cautiously.

Table 8 - Parsimonious multinomial logistic regression robustness checks comparing Groups 1 and 2 with Group 3 (reference category)

Predictor	G1 vs G3 RRR (95% CI)	p-value	G2 vs G3 RRR (95% CI)	p-value
Model 1 – Closing time				
Closing time (standardised)	3.26 (1.87 – 5.66)	< 0.001	3.48 (1.92 – 6.30)	<0.001
Model 2 – Daily opening span				
Daily opening span (standardised)	5.99 (2.70 – 13.26)	<0.001	4.28 (1.90 – 9.65)	<0.001

Note. Relative risk ratios (RRRs), 95% confidence intervals (CIs) and p-values are reported. Two separate parsimonious multinomial logistic regression models were estimated because closing time and daily opening span are mechanically related. G3 was used as the reference category. Continuous predictors were standardised before estimation.

These results indicate that the principal venue-level distinction concerns later closing and longer daily availability rather than a clear differentiation between G1 and G2. The extended models retained the same directional temporal associations. Still, estimates for window opacity and dedicated website presence were numerically unstable because of sparse and near-separated distributions. These models are therefore interpreted only as supplementary regression-based robustness checks.

The three-group comparison indicates that the main temporal contrast concerns G3 rather than a clear distinction between G1 and G2. Both G1 and G2 had a me-

dian closing time of 23:00, compared with 22:00 in G3, while median daily opening span was 14 hours in G1, 13 hours and 30 minutes in G2 and 12 hours in G3. Opening time was less informative: G1 and G2 combined did not differ meaningfully from G3, although G1 opened earlier in the three-group comparison. This does not support treating earlier opening as a general feature of trace-positive centres. The main distinction therefore lies in later closing and longer daily availability. Window opacity also differentiated the groups but requires caution. Tinted or closed windows were observed in all G1 and G2 cases, compared with 24 of the 28 G3 cases for which window information was available (85.7%). The difference was statistically robust and showed a moderate association. Yet opacity was not exclusive to centres associated with erotic-service traces. It may reflect privacy, bodily massage services, aesthetic conventions, commercial discretion, or concealment. It should therefore be read as part of a broader venue-level profile, not as an individual-level indicator.

Dedicated websites were rare overall and were observed only in G3. In the primary comparison, no G1 or G2 observation had a dedicated website, compared with 3 of 31 observations in G3. Although the numbers were small, the difference remained significant after correction. This pattern is consistent with the possibility that centres without comparable erotic-service traces rely more on conventional online commercial presentation. Given the small number of websites, however, this result should be interpreted as a contextual signal rather than as a strong differentiating feature (Table 7).

Overall, RQ1 receives an affirmative but qualified answer. Chinese-linked massage centres associated with direct or corroborative erotic-service traces differ from centres without comparable traces in selected venue-level characteristics. The clearest differences concern later closing times, longer daily opening spans and more consistently observed window opacity. Dedicated websites are rare, but their presence only in G3 is consistent with the broader visible profile.

These group-level findings remain context-dependent. Long hours may reflect customer availability, self-employment, ordinary service provision, or competition; tinted windows may reflect privacy, bodily intimacy, aesthetics, or discretion; and absent websites may signal informality, limited digital investment or alternative visibility channels. The data do not support attributing these patterns to Chinese culture or deliberate concealment. Venue-level indicators are therefore meaningful only within a comparative, triangulated design and cannot establish what occurs inside individual venues.

5.2. Corporate Structure: No Robust Entity-level Signature after Correction

The second research question examines whether the legal entities linked to the massage centres differ across groups in formal corporate characteristics, including legal form, size, status, sector classification, corporate actors, financial profile and risk indicators. The aim is not to infer operational control, but to assess whether trace-positive centres show a distinctive formal business profile. The corporate layer shows limited differentiation. Legal forms are highly homogeneous: sole proprietorships account for 158 of 167 entities in Groups 1 and 2 and all 31 in Group 3. Beneficial-owner and shareholder variables show some descriptive variation, but no stable pattern after multiple-testing correction.

The nationality composition of recorded corporate actors also does not robustly separate the groups. Director, manager and senior-management variables are also non-differentiating. Italian directors or managers appear across groups, while Chinese directors or managers do not clearly distinguish trace-positive centres. Chinese-linked public presentation therefore does not necessarily coincide with formal Chinese management, and the absence of recorded Chinese managers does not exclude informal Chinese-linked involvement in daily operations, labour organisation, tenancy or other arrangements.

Financial and risk indicators show no robust group-level pattern. Total assets, operating revenue, logged financial variables, employees, corporate-complexity measures, ownership-opacity scores, and IPM risk indicators do not consistently separate the groups after correction. The corporate layer therefore helps describe the sample but does not mirror the venue-level differences in RQ1. Overall, RQ2 finds no robust formal corporate differentiation. Trace-positive centres are generally small, legally simple entities, similar to centres without comparable traces. Any organisational differences may instead lie in practical management, labour relations, or informal arrangements.

5.3. Property Environment: Reliance on Ordinary Urban Premises

The third research question links operating venues to cadastral ownership information to assess whether premises hosting centres associated with erotic-service traces show observable Chinese-linked property ownership more often than premises hosting centres without comparable traces. Two scopes are considered. The narrower premises-level or floor-level scope is closer to the venue used by

the massage centre. The broader building-level scope captures the wider property environment and therefore requires greater caution.

The results do not show a distinctive property pattern. In the primary comparison, observable Chinese-linked ownership at premises or floor level appears in 24 of 167 centres in Groups 1 and 2, compared with 4 of 31 centres in Group 3: 14.4% versus 12.9%. The difference is not statistically significant, and the effect size is negligible. The same pattern appears at building level. Observable Chinese-linked ownership is found in 55 of 167 centres in Groups 1 and 2 and 11 of 31 centres in Group 3, corresponding to 32.9% and 35.5%. Again, the difference is not statistically significant, and the effect size is negligible. The three-group comparison confirms the absence of meaningful differences at both levels.

Observable Chinese-linked property ownership therefore appears in a minority of cases at premises or floor level and in roughly one-third of cases at building level. However, it is not concentrated among centres associated with erotic-service traces. This weakens the interpretation that these traces are supported by a distinctive co-ethnic property infrastructure. Centres with and without comparable traces appear to operate in broadly similar property environments.

This result should still be read cautiously. The absence of an observable Chinese-linked ownership match does not prove that the property environment is unrelated to Chinese-origin actors. Cadastral data do not capture rental contracts, subletting arrangements, proxy ownership, informal access to premises or Italian-born owners of Chinese origin who are not visible as such in the available data. The property layer therefore suggests reliance on ordinary urban property markets, while also identifying an infrastructural dimension that requires further research.

5.4. Layered Interpretation and Overall Discussion

The results show partial and uneven observability. The clearest differences emerge at venue level: trace-positive centres tend to close later, remain open longer and show more consistent window opacity. Temporal information was less complete in G3, with opening and closing times available for 21 of 31 observations, compared with 108 of 109 in G1 and 55 of 58 in G2. These features are comparatively informative but remain contextual. The corporate layer does not reproduce these differences, as entities are mostly small and formally simple, with no robust separation in legal form, ownership, management, financial scale or risk indicators. Observable Chinese-linked property ownership likewise does not

distinguish trace-positive from trace-negative centres.

The Milan case therefore points to a visible distinction that is not matched by a distinctive formal corporate or property infrastructure. This is important for the interpretation of semi-hidden markets. Late closing hours, long daily opening spans or opaque windows may gain meaning across groups, but they should not be read in isolation. Business-register data help identify and describe legal entities, but they are limited in capturing practical control, labour relations or informal management. Property data clarify the infrastructural setting of venues, but cannot fully reveal tenancy, proxy ownership or informal access arrangements.

The generalisability of these findings should be understood cautiously. Some venue-level patterns, such as long opening hours, opaque shopfronts and limited conventional web presence, resonate with studies of massage venues and indoor sex markets in other urban contexts. However, the specific Milan pattern – clear venue-level differences but weak corporate and property signatures – may depend on local conditions, including the personal-service economy, Chinese-linked migration and business networks, data availability and the urban property market. The findings should therefore be read as analytically transferable rather than statistically generalisable.

Overall, the findings support a layered approach to semi-hidden markets. The value of the analysis lies less in any single indicator than in the separation and comparison of multiple layers: venue presentation, formal corporate structure and property environment. This makes it possible to identify group-level differences while keeping uncertainty explicit. The empirical contribution is therefore methodological as well as substantive: the study shows how partial traces can be compared systematically without collapsing visibility, ethnicity, corporate form and property ownership into a single interpretation.

6. LIMITATIONS

This study's limitations derive from the semi-hidden and partially observable nature of indoor sex markets. These markets leave uneven traces across digital platforms, business registers, visual observation and property records. The design compares these traces but cannot eliminate the uncertainty attached to them. The first limitation concerns group classification. Groups 1 and 2 are defined through observable erotic-service traces: direct advertising and corroborative user-generated indications. These traces are analytically meaningful, but they do not establish

sexual-service provision, exploitation or trafficking. Group 3 includes centres with no comparable traces in the selected sources and observation period. It is therefore a comparison group defined by the absence of observed traces, not by evidence that sexual services are absent.

A second limitation concerns visibility bias. Digital and visual sources, including advertising platforms, forums, Google Maps, Street View, reviews and websites, do not capture all venues equally. Some centres are more visible because they advertise, receive user-generated comments, appear clearly from the street or maintain a more explicit online presence. Others may be located inside buildings, digitally marginal, recently opened, rebranded or absent from the platforms considered. Missingness should therefore be interpreted in relation to the conditions under which venues become observable, rather than as a purely technical data issue. This issue is particularly relevant to the temporal variables.

Complete opening and closing times were available for 184 of the 198 observations, but missingness was uneven across groups. Temporal information was unavailable for 1 of 109 observations in G1 and 3 of 58 in G2, compared with 10 of 31 in G3. The temporal comparisons and multinomial models were therefore based on 108 G1, 55 G2 and 21 G3 observations. This imbalance does not invalidate the observed differences, but it limits the representativeness of the G3 temporal profile. Centres with publicly available opening hours may represent a more visible, formally presented or digitally documented subset of G3. Complete-case results may therefore underrepresent less visible G3 venues, whose missing observations cannot be assumed to follow the same pattern.

Third, “Chinese-linked” is an operational category. It identifies centres connected to Chinese massage, public representation, Chinese-linked individuals or other observable markers. It does not imply that ownership, labour, management or control are always Chinese, nor does the absence of such markers exclude less visible Chinese-origin involvement. Fourth, business-register data capture formal legal structures rather than actual operational arrangements and may not reveal daily management, recruitment, rent negotiations, informal influence or exploitation. The absence of robust corporate differences should therefore be interpreted as an absence of observable formal differentiation, not as evidence that practical arrangements are identical across groups.

Fifth, the property analysis is limited by matching uncertainty and cadastral-data scope. Chinese-linked ownership does not prove business control, while its absence does not exclude rental, subletting, proxy ownership, informal access or

Italian-born owners of Chinese origin not visible in the data. Property findings therefore describe only the observable property environment. Finally, the analysis is cross-sectional and limited to the Province of Milan. Venues may rebrand, relocate or change their practices, and local patterns may not apply elsewhere. The study therefore offers analytical transferability rather than statistical generalisability: a replicable framework for comparing partially observable venue-level configurations, not a claim that the Milan pattern applies to other cities or periods.

7. CONCLUSION

This study examined whether Chinese-linked massage centres in the Province of Milan differed according to the presence and type of observable erotic-service traces, focusing on venue visibility, temporal availability, formal corporate organisation and the surrounding property environment. The findings show that the three groups cannot be understood as entirely separate types of business. Instead, the clearest distinction lies between centres with direct or corroborative erotic-service traces, represented by G1 and G2, and centres without comparable observable traces, represented by G3.

The strongest venue-level differences concerned temporal availability. G1 and G2 closed later and operated for longer daily periods than G3, while opening time was less informative in the primary comparison. These patterns were supported by both non-parametric tests and multinomial regression models. Relative to G3, later closing times and longer daily opening spans were associated with substantially higher relative risks of belonging to both G1 and G2. The consistent direction of the regression estimates and the broadly similar descriptive profiles of G1 and G2 indicate that temporal organisation differentiates trace-positive from trace-negative venues more clearly than it differentiates direct advertising evidence from user-generated corroboration.

Window opacity formed another element of this venue-level profile. Tinted or closed windows were observed in every G1 and G2 case and in a large majority of G3 cases. Opacity therefore differentiated the groups statistically but was not exclusive to centres associated with erotic-service traces. It should not be interpreted independently as evidence of concealed sexual activity. Dedicated websites displayed the opposite pattern: they were rare overall and were observed only in G3. This result is consistent with greater reliance on conventional commercial presentation among a small subset of trace-negative centres, although the low

number of websites prevents strong generalisation.

Together, the findings support an affirmative but qualified answer to RQ1. Chinese-linked massage centres associated with direct or corroborative erotic-service traces differ from centres without comparable traces in selected observable characteristics, particularly later closing, longer daily availability and more consistently observed window opacity. These characteristics are meaningful only at group level and within a triangulated analytical design. They cannot establish what occurs inside a particular venue, identify individual offending businesses or demonstrate intentional concealment.

The analysis also highlights the separation between observable venue practices, formal corporate structure and the property environment. Public-facing characteristics may vary even when formal organisational arrangements remain similar, and the ownership or characteristics of the surrounding premises should not be treated as direct indicators of the activities conducted by individual businesses. This distinction is important for avoiding the conflation of ethnicity, property ownership, commercial informality and criminality.

Several limitations require caution. The groups were unequal in size, some categorical variables were sparse or nearly separated, and temporal information was disproportionately missing in G3. The G3 temporal profile was therefore based on only 21 complete observations and may reflect its more publicly visible subset. The study also relied on observable and secondary-source indicators rather than direct observation of services, workers or clients. Its conclusions concern statistical differences between analytically constructed groups, not proof regarding individual venues.

Despite these limitations, the study demonstrates the value of combining digital traces, user-generated evidence, venue characteristics, corporate information and property data without treating any single indicator as determinative. Future research should test whether the Milan pattern appears in other cities and periods and should integrate qualitative, worker-centred and victim-centred evidence. Comparative and longitudinal analysis could clarify whether later operating hours, extended availability and reduced conventional web presence represent locally specific market adaptations or recurring features of Chinese-linked massage markets more broadly.

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APPENDIX

Supplementary Table S1 – Extended multinomial logistic regression sensitivity analyses including window opacity and dedicated website presence.

Predictor	G1 vs G3 RRR (95% CI)	p-value	G2 vs G3 RRR (95% CI)	p-value
Model 1 – Closing time				
Closing time (standardised)	2.38 (1.34 – 4.21)	0.003	2.54 (1.38 – 4.68)	0.003
Tinted/closed windows	17.35 (0.37 – 806.59)	0.145	8.14 (0.17 – 392.58)	0.289
Dedicated website	0.09 (0.00 – 4.10)	0.217	0.20 (0.00 – 9.49)	0.416
Model 2 – Daily opening span				
Daily opening span (stan- dardised)	4.37 (1.92 – 9.98)	< 0.001	3.13 (1.35 – 7.28)	0.008
Tinted/closed windows	20.20 (0.51 – 804.39)	0.110	13.99 (0.35 – 559.81)	0.161
Dedicated website	0.08 (0.00 – 3.76)	0.201	0.11 (0.00 – 4.79)	0.252

Note. Relative risk ratios (RRRs), 95% confidence intervals (CIs) and p-values are reported. Extended sensitivity models additionally included window opacity and dedicated website presence. G3 was used as the reference category. Estimates for window opacity and dedicated website should be interpreted cautiously because sparse and near-separated data produced wide confidence intervals.