

Doctoral research proposal

Urban financial microflows

Ordinary monetary circulation and intra-urban economic structures

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Doctoral project in economic geography and urban analysis

Distribution note - Document intended for a restricted circle of researchers, experts and actors involved in the analysis of urban economic dynamics and payment infrastructures.

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Purpose and ambition of the project

This research is first and foremost situated within urban economic geography. It proposes to analyse digital payment infrastructures as vectors of the circulation of value, in order to understand how aggregated monetary flows reveal, structure or reinforce, at the intra-urban scale, economic centralities and certain socio-spatial inequalities.

The focus of the project is not primarily the adoption of digital payments as such. Rather, it concerns the post-deployment appropriation of payment arrangements, that is to say their concrete insertion into local economies, the variable conditions of their use, and their differentiated effects according to types of urban space. Instant payments, card networks, wallets, payment platforms and acquiring systems are thus approached as socio-technical arrangements that influence or filter access to circuits of spending. They also play a role in economic visibility, transaction costs and forms of intermediation.

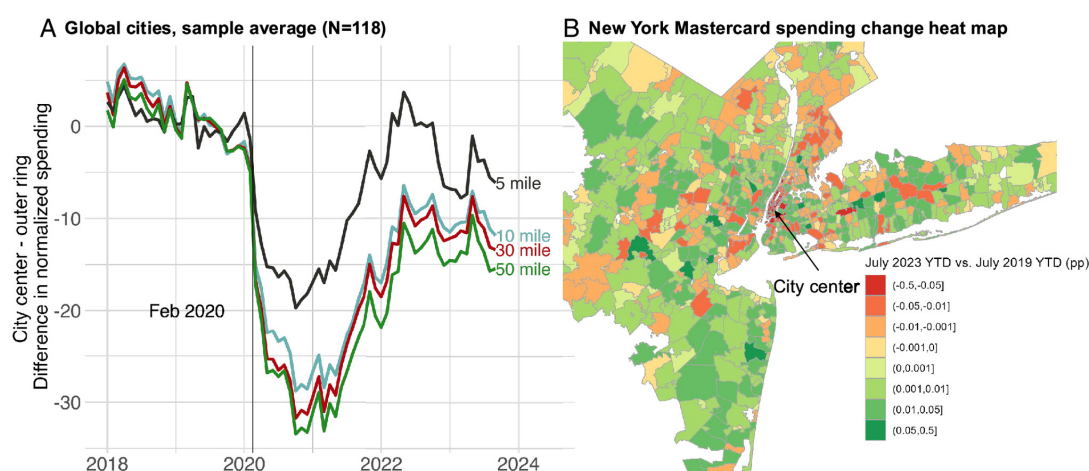


Figure 1: Spatial redistribution of spending between urban centres and peripheries. This figure illustrates what researchers describe as the “Donut Effect”, that is to say the relative shift in spending growth from city centres to peripheries across a set of major cities. It shows that spending flows constitute a revealing indicator of the spatial recompositions of urban economic activity. *Source.* Adapted from Ramani, A., Alcedo, J., & Bloom, N. (2024). *How working from home reshapes cities.* *Proceedings of the National Academy of Sciences*, 121(45), e2408930121. <https://doi.org/10.1073/pnas.2408930121>

This perspective makes it possible to read the city not only through employment, land or mobility, but also through the effective circulation of value in everyday life. Payments are therefore neither a simple technical tool nor a pure financial indicator: they constitute an empirical entry point for analysing the ordinary economic structure of the city.

Scientific debate and positioning

A project at the intersection of three debates

The project lies at the intersection of three debates that are often treated separately, even though they gain from being articulated. The general challenge is to understand how payment infrastructures, approached as infrastructures for the circulation and rendering visible of value, make it possible to shed different light on intra-urban economic structure.

Urban economic centralities and the circulation of value

Urban economic geography has long analysed centralities, polarisations, territorial differentiations and the functional hierarchies of urban space. These structures, however, are often approached through employment, metropolitan functions, commerce, land or mobility. The project proposes to complement these readings with an entry centred on the effective circulation of value in the city. Aggregated transactional data open a distinctive avenue here: they make it possible to grasp the city through its daily spending flows and thus through the concrete forms of economic participation that traverse urban spaces differentiated socially and functionally.

Economic inclusion, smoother exchanges and new dependencies

A second debate runs through the literature on digital payments and digital finance. On the one hand, these arrangements are associated with a reduction of frictions, an extension of economic opportunities, greater fluidity of exchanges and sometimes forms of formalisation or inclusion. On the other hand, they can also reinforce dependencies on intermediaries, produce cost asymmetries, lock in certain uses, intensify value capture and transform economic activity into exploitable traces. The project does not assume in advance that a territory necessarily shifts towards one or the other of these scenarios. On the contrary, it seeks to identify the mechanisms and socio-spatial conditions under which payment infrastructures are associated either with a greater capacity for economic participation or with new forms of dependence and asymmetry.

Payments and transactional traces as socio-technical infrastructures of visibility

The third debate concerns how to think simultaneously about payments and the traces they produce. The project treats payments not as a simple instrumental layer, but as a socio-technical infrastructure composed of standards, networks, interfaces, acceptance arrangements, compliance constraints and chains of intermediation. When they function, these infrastructures tend to become invisible; when they filter access, generate cost asymmetries or impose certain forms of economic visibility, they become, on the contrary, a major territorial and political issue. Transactional data are therefore not only a new empirical source: they also participate in the production of indicators, categories and hierarchies of what becomes measurable in the city. The project thus contributes to a reflexive reading of transactional traces, attentive to their descriptive power but also to their coverage biases, their aggregation effects and their conditions of interpretation.

Disciplinary positioning

The disciplinary centre of the project is urban economic geography. It is this field that provides the main question: how are economic centralities structured, displaced or differentiated within the city? The project then mobilises financial geography and monetary geographies in order to think about the circulation of value, intermediaries and the territorial embedding of monetary arrangements. STS and infrastructure studies constitute a secondary theoretical support, useful for understanding how the technical and organisational properties of payment arrangements participate in the production of spatial effects. Finally, quantitative spatial analysis, network analysis and urban data studies play a methodological and reflexive role, without constituting the theoretical core of the project.



Figure 2: This photograph of a payment arrangement in a commercial establishment in Rio de Janeiro makes visible the multiplication and coexistence of material payment infrastructures within a single commercial space. The photograph highlights a dense technical arrangement combining an electronic payment terminal for cards and contactless payment, together with an interactive interface guiding the user in the choice of different means of payment with the aid of accessible iconography. The whole is complemented by QR codes providing access to information and varied payment modalities, notably Pix, a digital payment system developed by the Brazilian state, operating by QR code or unique identifier. The presence of visual capture devices (cameras, return screens) indicates surveillance of interactions, while a smartphone dedicated to payment by facial recognition, accompanied by promotional material, introduces an additional application layer. The image thus makes visible the densification and hybridisation of the technical, informational and commercial arrangements that frame the act of payment. *Source.* Trousselle, P. (2025). *Field photograph taken during research in Rio de Janeiro* [Photograph]. Author's personal archives.

Central theoretical mechanism

The project's general hypothesis is that payment infrastructures are not neutral within the city. They configure access to circuits of spending, the reliability of exchanges, transaction costs, economic visibility and capacities for merchant acceptance. These properties influence localised forms of economic participation, differently according to social groups, types of commerce and territories.

These differentiated effects manifest themselves in urban financial microflows, that is to say in aggregated signals of the circulation of value observable at a fine spatial and temporal scale. The analysis of these flows then makes it possible to reveal economic centralities, asymmetries of

attraction, territorial dependencies and forms of functional specialisation. The project proposes a mechanism of spatial mediation: payment infrastructures reconfigure certain local conditions of the circulation of value, and these reconfigurations become partially observable in aggregated spending flows.

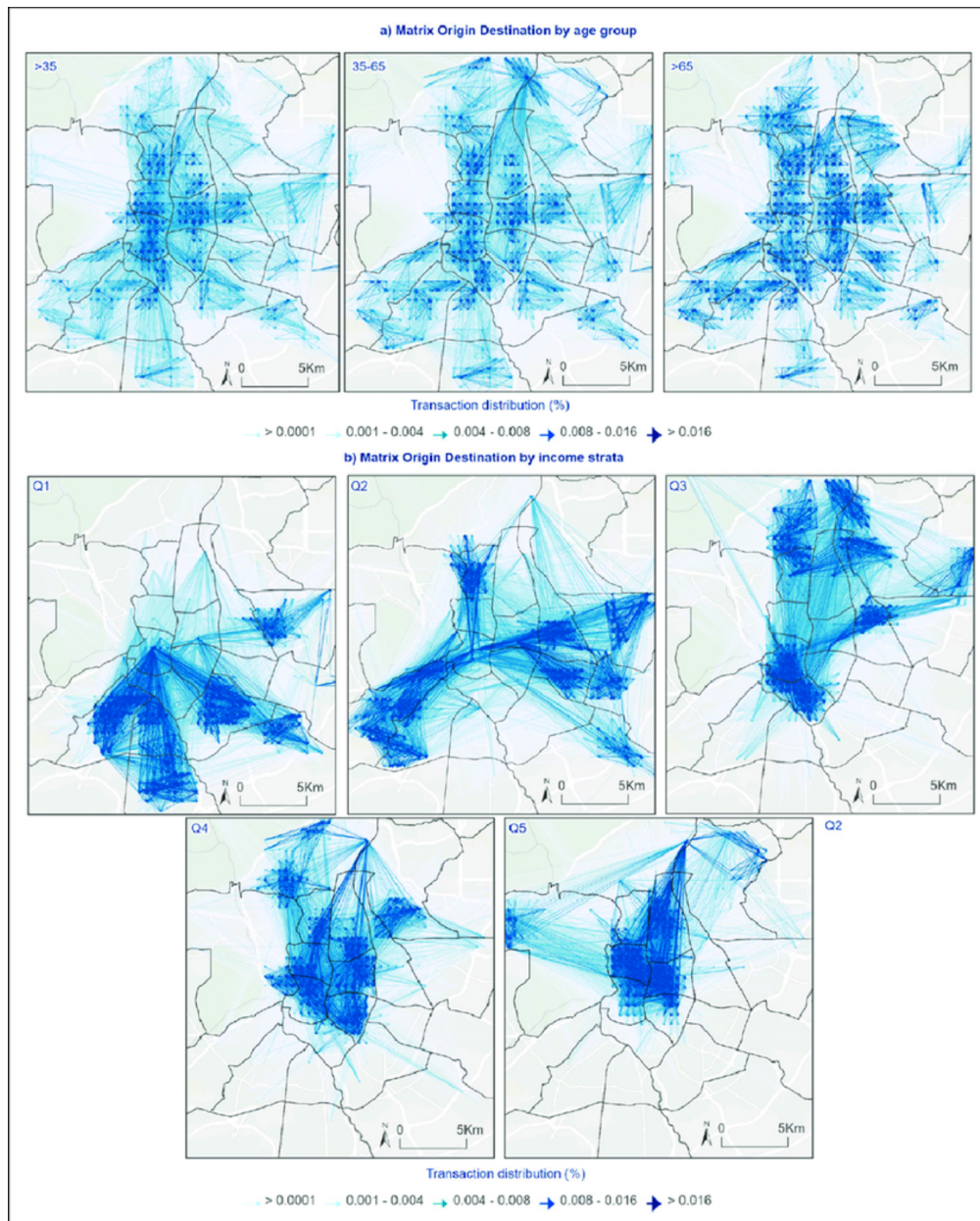


Figure 3: Origin-destination matrix of intra-urban consumption flows by population groups. This figure shows that transactional data make it possible to reconstruct relational economic mobilities between spaces of residence and spaces of consumption. It directly illustrates the potential of reading the city through flows rather than through spending volumes alone. *Source.* De las Obras-Loscertales, J., Garcia-Palomares, J., Ramiro-Farinas, D., Martin-Caro, M., & Gutierrez, J. (2026). *Intra-urban consumption flows and sociospatial disparities: An analysis based on bank card transaction data.* *Environment and Planning B: Urban Analytics and City Science.* <https://doi.org/10.1177/23998083261420309>

Theoretical chain, core of the project:

- payment infrastructures configure the conditions of access, cost, visibility and acceptance of exchanges;

- these conditions modify localised forms of economic participation;
- they become observable in aggregated financial microflows;
- which reveal or reinforce economic centralities and socio-spatial inequalities.

Central concepts

Urban financial microflows

Urban financial microflows refer to aggregated signals of the circulation of value at a small spatial and temporal scale. They make it possible to observe the economic intensity of places, rhythms of spending, commercial polarities and, when the data allow it, relationships between spaces of residence and spaces of consumption.

Payment infrastructures

Payment infrastructures refer to the whole set of technical, organisational and regulatory arrangements that make the transfer of value possible: rails, interfaces, terminals, acceptance networks, intermediaries, compliance standards and conditions of access. The project treats them as arrangements that structure exchanges rather than as a simple neutral support.

Post-deployment appropriation

Post-deployment appropriation refers to the actual, situated and differentiated uses of payment arrangements once they are in circulation. It makes it possible to study the trade-offs, frictions, dependencies and adaptations encountered by merchants, users and small economic actors in differentiated urban contexts.

Economic centralities

Economic centralities are defined here as spatial polarities of spending, attraction and commercial activity. They are not measured only by volume, but also by connectivity, specialisation and the capacities that allow them to organise flows.

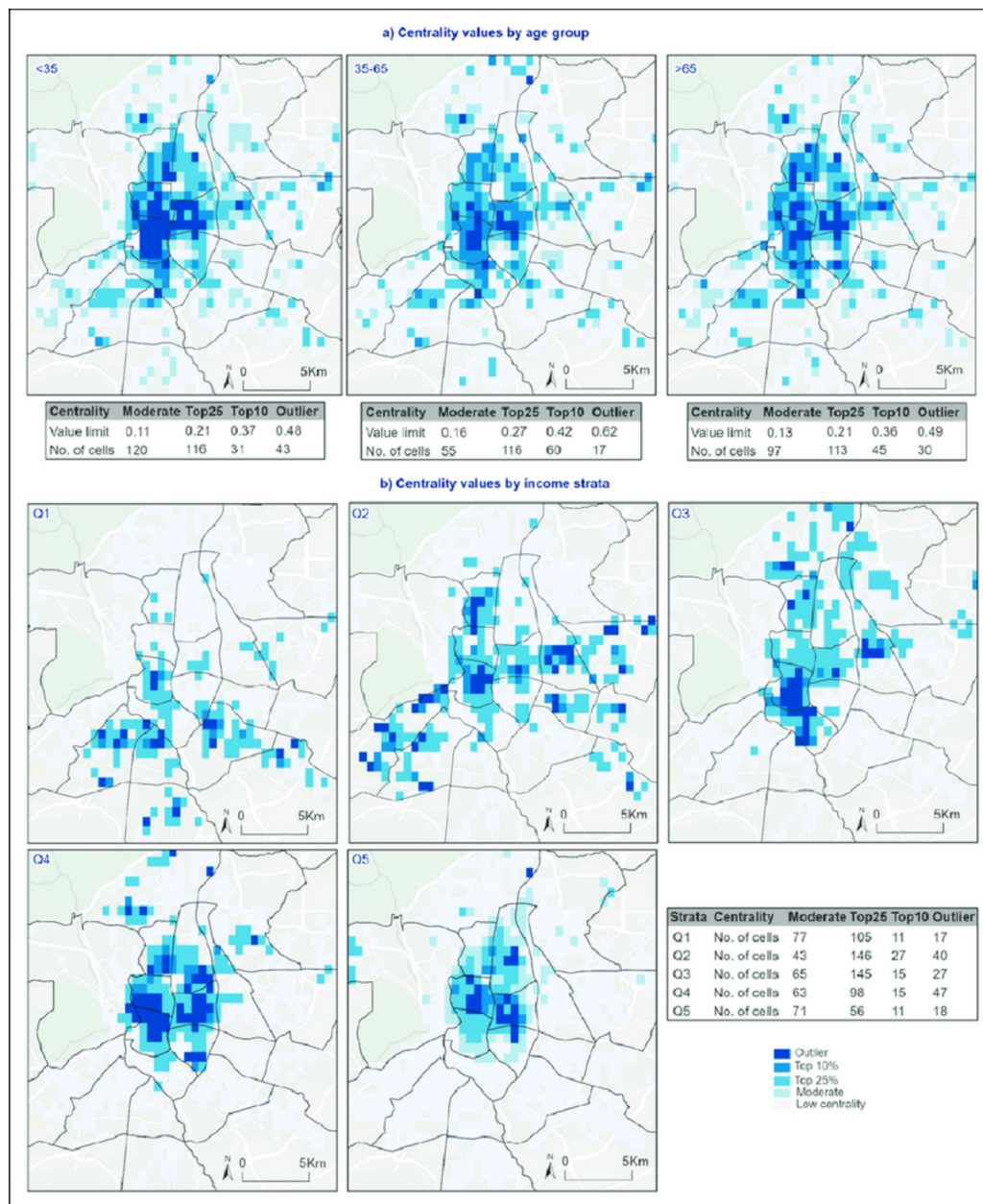


Figure 4: Economic centrality by population groups. This figure is directly aligned with the core of the project since it relates economic centralities to socio-spatial disparities. It makes it possible to illustrate visually that consumption structures and poles of attraction are not distributed uniformly across social groups. *Source.* De las Obras-Loscertales, J., Garcia-Palomares, J., Ramiro-Farinas, D., Martin-Caro, M., & Gutierrez, J. (2026). *Intra-urban consumption flows and sociospatial disparities: An analysis based on bank card transaction data.* *Environment and Planning B: Urban Analytics and City Science.* <https://doi.org/10.1177/23998083261420309>

Socio-spatial inequalities

The notion of socio-spatial inequalities refers here to asymmetries of access, cost, economic visibility and capacity for insertion into circuits of spending. The project does not seek to infer individual categories directly from transactions, but to analyse differentiated territorial configurations of economic participation.

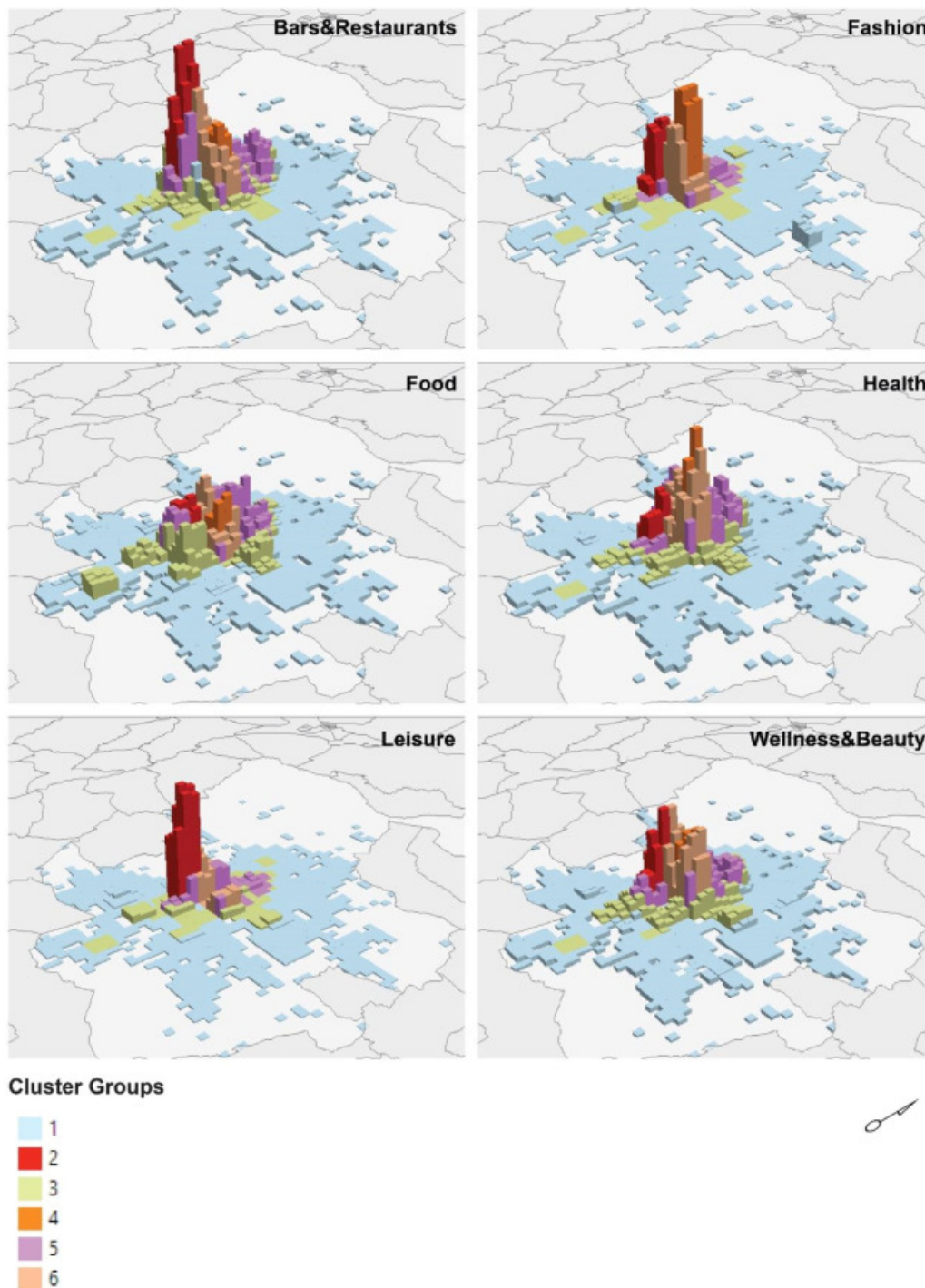


Figure 5: Spending environments in the city of Madrid (colours) and total volume of spending (extrusion heights proportional to z-scores). This figure shows that economic centralities can be differentiated both by the intensity of spending and by their sectoral specialisation. It reinforces the idea that the spatial structure of urban economic activity combines concentration, hierarchisation and functional diversity. *Source.* Adapted from Carpio-Pinedo, J., Romanillos, G., Aparicio, D., Hernandez Martin-Caro, M. S., Garcia-Palomares, J. C., & Gutierrez, J. (2022). *Towards a new urban geography of expenditure: Using bank card transactions data to analyze multi-sector spatiotemporal distributions.* *Cities*, 131, 103894. <https://doi.org/10.1016/j.cities.2022.103894>

Authors

The first core of authors mobilised is that of the geography of finance and urban economics. Wojcik, Knox-Hayes, Leyshon, Langley and Aalbers provide the most useful framework for thinking about the circulation of value, intermediaries, financialisation, platforms and the forms of economic power inscribed in space.

A second group of authors is central for the empirical use of transactional data and for the territorial reading of consumption flows. The work of Garcia-Palomares, Carpio-Pinedo, De las Obras-Loscertales and Aparicio shows in a very concrete way how bank transactions can shed light on the intra-urban structuring of spending, economic mobilities and socio-spatial disparities.

A third set, more secondary but theoretical, makes it possible to think infrastructure as a relational and political arrangement. Star, Larkin and Maurer help us understand how technical, organisational and regulatory architectures become conditions of possibility for exchanges, forms of power and differentiated filters depending on contexts of use.

Gaps in the literature

The literature on digital payments and digital finance has produced important findings on access to financial services, inclusion and the spread of usage. The work of the World Bank (2022) has thus documented well a growing importance of digital payments for access to banking, household resilience and the formalisation of certain economic practices, while the BIS (2024) has underlined the recent acceleration of fast payments and their importance in periods of crisis.

This literature nevertheless remains mainly oriented towards the adoption, diffusion and performance of arrangements, rather than towards their post-deployment effects on intra-urban economic organisation. Yet it is precisely at this scale that reconfigurations of centralities, constraints on access to circuits of spending and asymmetries between central, intermediate and marginal spaces are at stake.

A second limitation lies in the insufficient territorial theorisation of the differentiations observed. Work in financial geography has strongly contributed to thinking about the spatialisation of financial intermediaries and relations of economic power (Knox-Hayes & Wojcik, 2021), while Langley and Leyshon (2021) have shown how platform and fintech dynamics reconfigure forms of intermediation and value capture. These contributions, however, remain only weakly articulated with a fine reading of urban centralities, margins and mobility constraints that organise the ordinary circulation of value within the city.

A third limitation lies in the very status of payment infrastructures, still often treated as a simple technical backdrop. Maurer (2012) nevertheless showed long ago that the *payments space* constitutes a social, institutional and material space of mediation. Finally, recent work on urban transactional data, in particular Carpio-Pinedo et al. (2022) and De las Obras-Loscertales et al. (2026), has opened a highly promising empirical avenue for analysing consumption flows and socio-spatial disparities. But, as is also suggested by the comparison between spending, transactions and footfall proposed by Klopach and Luco (2025), this avenue still faces a major methodological difficulty: between open macro statistics and private microdata that are difficult to access, the intermediate space of aggregated indicators remains under-institutionalised, even though it is probably the most relevant for rigorously analysing the centralities, urban margins

and territorial asymmetries that lie at the heart of this thesis.

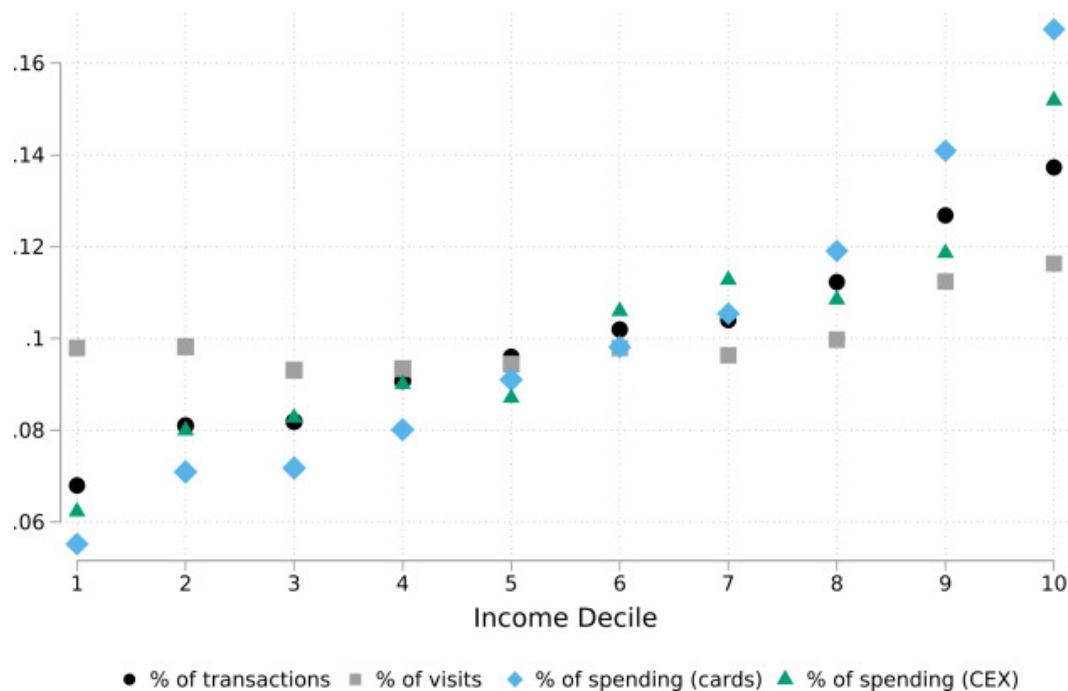


Figure 6: Distribution of activity between footfall, transactions and spending across income deciles. This figure shows that payment data do not capture exactly the same realities as mobility or footfall data and that they present potential social biases. It is important for justifying a cautious and methodologically reflexive reading of transactional data. *Source.* Klopck, E., & Luco, F. (2025). *Measuring local consumption with payment cards and cell phone pings.* Figure 1, “Share of foot traffic, transactions, and spending by income decile”.

What the project adds that is new

Theoretical contribution

The thesis proposes an integrated reading of digital payments as urban infrastructures of the circulation of value. It thereby contributes to bringing urban economic geography, monetary geographies and infrastructure studies closer together around a single object: the way in which the city is structured by ordinary circuits of spending.

Analytical contribution

The project shows that aggregated monetary flows can be used to identify economic centralities, asymmetries of attraction, functional specialisations and certain forms of territorial dependence that are not fully visible through indicators of employment, transport or land alone.

Methodological contribution

The research aims to construct a reproducible framework for territorial analysis from strictly aggregated transactional data. Questions of protection, aggregation, robustness and auditability are taken seriously, but they remain subordinate to the main scientific objective: producing a credible reading of intra-urban economic structure.

Empirical contribution

The thesis should provide fine-grained results on the distribution of spending, consumption centralities, gradients of territorial dependence and socio-spatial disparities, notably in peripheral, working-class or secondary spaces that are often less visible in the literature.

Empirical strategy and feasibility

The investigation is conceived from the outset at the intra-urban scale. At this stage, the field site has not been definitively selected, insofar as the choice of case study will depend in part on the conditions of access to aggregated transactional data provided by institutional or private actors. It aims to compare contrasted spaces within the same city or across several comparable sites: established economic centralities, intermediate mixed spaces, secondary commercial polarities, peripheries and working-class spaces more weakly integrated into dominant circuits of spending. The objective is not only to measure transactional volumes, but to reconstruct a differentiated geography of the circulation of value, attentive to forms of attraction, dependence, specialisation and territorial asymmetry.

The main data will be aggregated transactional data drawn, depending on access possibilities, from card networks, instant payments, wallets or payment platforms. When origin-destination matrices are available, they will allow a relational reading of flows between spaces of residence and spaces of consumption. In their absence, the analysis will rely on indicators of place of spending, transactional frequency and, if possible, volume, which will be related to complementary urban data concerning accessibility, planning layers, commercial morphology and certain socio-demographic contexts.

Such a strategy should make it possible to produce several types of empirical result: maps of transactional intensity, identification of economic centralities, typologies of consumption spaces, gradients of dependence on certain polarities and, when the data allow it, representations of flows between zones. The methods mobilised will include global and local spatial autocorrelation, clustering procedures, multi-scale tests to assess the robustness of the results, as well as flow network analysis when relational information is available.

The quantitative approach will be complemented, if possible, by semi-structured interviews. These do not have only an illustrative function: they should make it possible to shed light on situated uses, constraints of acceptance, trade-offs between means of payment, costs borne by economic actors and frictions that are not directly legible in aggregated data. The feasibility of the project thus rests on a progressive and adaptable empirical architecture, capable of producing a rigorous reading of intra-urban economic organisation, including in a context of partial and constrained access to data.

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