

Caractéristiques, mécanismes, difficultés et réponses de la relation spatiale emploi-résidence : une perspective de réseau

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Résumé : À partir des données de signalisation mobile de Shanghai, l'étude construit un réseau emploi-résidence et examine ses nœuds, arêtes et organisation globale. Les résultats montrent une structure à un noyau et plusieurs clusters, où la distance et le prix du logement déterminent l'intensité des flux. Les simulations soutiennent des stratégies d'accessibilité résidentielle et de décentralisation de l'emploi.

Mots-clés : emploi-résidence; réseau complexe; déplacements domicile-travail; accessibilité du logement; Shanghai

1 Revue de littérature

Les mesures classiques d'équilibre emploi-résidence sous-estiment les flux entre unités. L'approche par réseau décrit les unités spatiales comme nœuds et les déplacements comme arêtes dirigées.

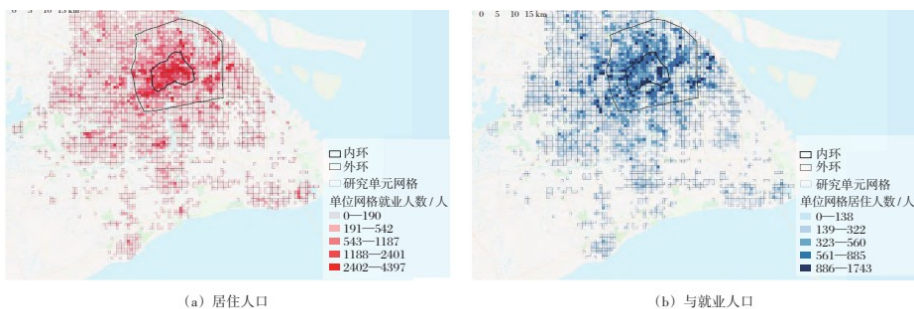


图1 居住人口与就业人口的分布特征

Fig. 1 Spatial distribution of residential and employment populations

2 Conception et données

L'étude utilise une grille de 1 km et des données China Unicom d'octobre 2023, validées par le recensement et complétées par les prix immobiliers.

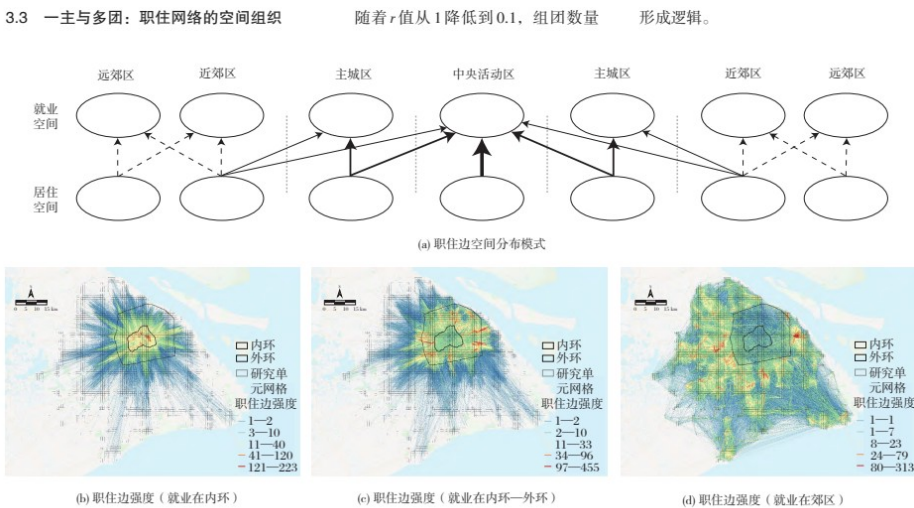


图2 上海市职住边空间分布模式及强度分布特征

Fig. 2 Spatial patterns and intensity of jobs-housing edges in Shanghai

3 Caractéristiques du réseau

L'emploi est plus concentré que la résidence. Les arêtes vers le centre sont fortement centripètes, tandis que les liaisons suburbaines restent plus locales. L'ensemble forme un noyau central et plusieurs clusters.

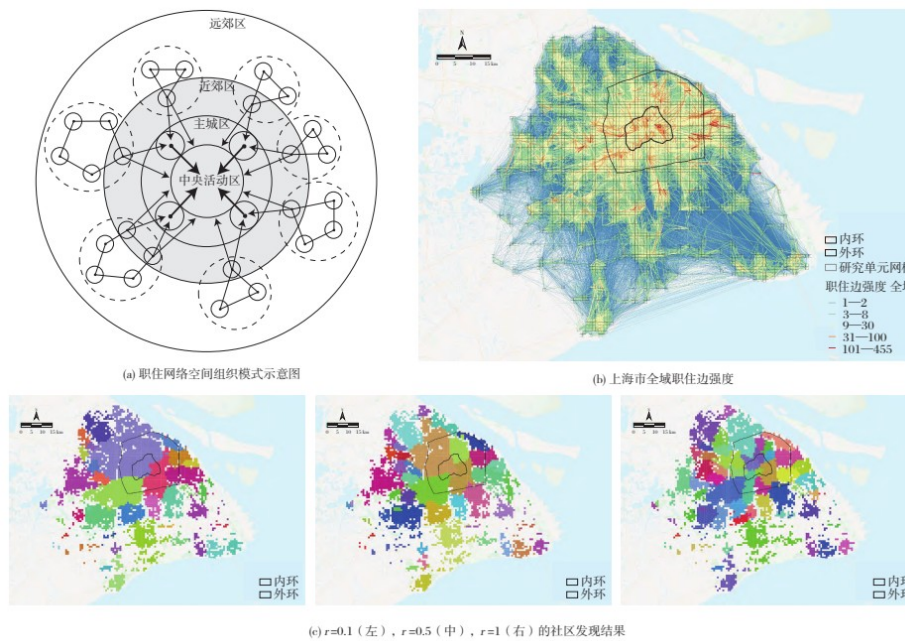


Fig. 3 Network organization, edge intensity, and community-detection results

4 Mécanismes

La formation des arêtes suit une loi de puissance. La distance spatiale et le prix du logement diminuent l'intensité des liens; la concentration de l'emploi central et le gradient monocentrique des prix structurent le réseau.

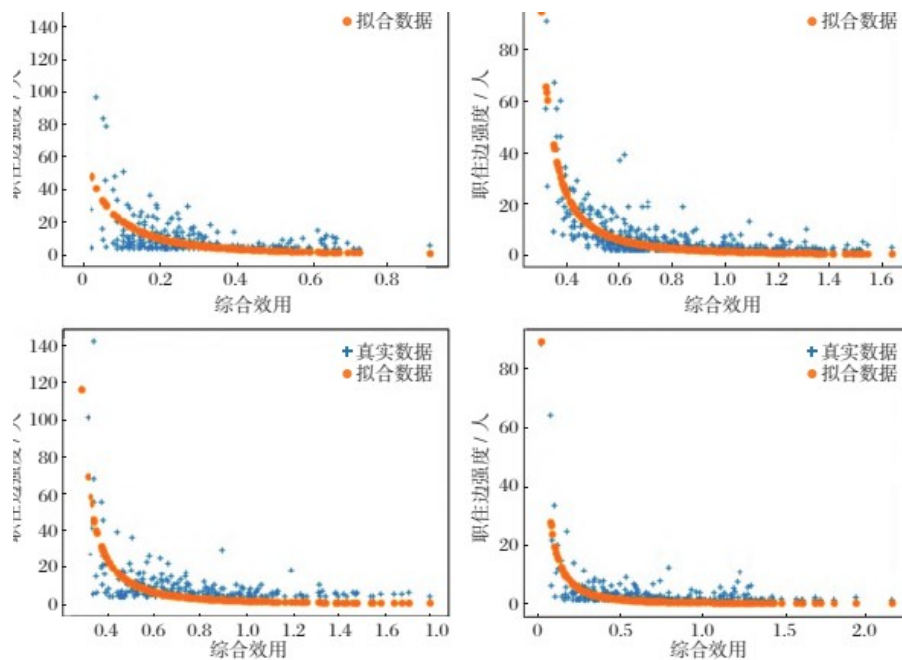


Fig. 4 Model fits for the six largest employment nodes

5 Difficultés

Les principaux problèmes sont la séparation spatiale, les goulets d'étranglement de transport et l'inégalité sociale, notamment la pauvreté temporelle des groupes à faible revenu.

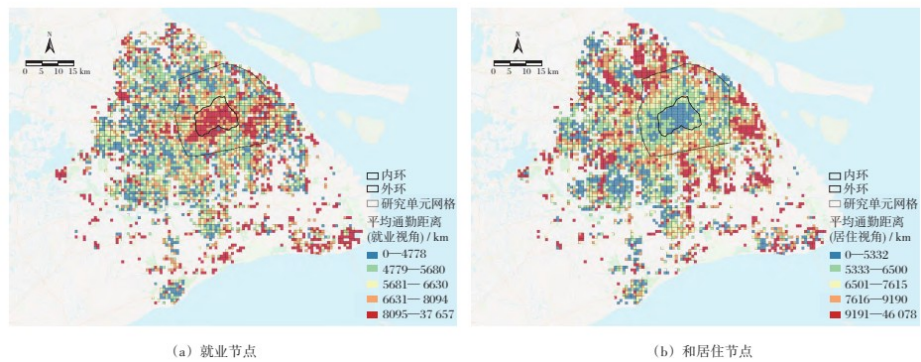


图5 就业节点（左）和居住节点（右）平均通勤距离
Fig.5 Average commuting distance of employment nodes (left) and residential nodes (right)

6 应对 不纳入场景考虑范围。 距离分布呈现出中间低、四周高的典型模式。然而，随着就业多中心化趋势的

Fig. 5 Average commuting distance of employment and residential nodes

6 Réponses

Les simulations indiquent que l'amélioration de l'abordabilité du logement et la décentralisation de l'emploi peuvent réduire la distance moyenne de déplacement et équilibrer les flux.

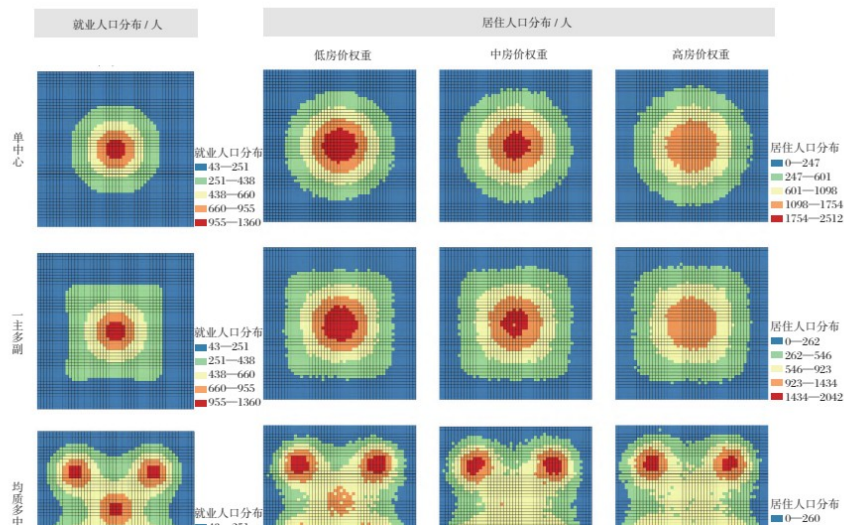


Fig. 6 Simulated employment and residential population under alternative scenarios

7 Conclusions

La perspective de réseau relie forme spatiale, marchés résidentiels et organisation de l'emploi, fournissant un outil pour planifier une relation emploi-résidence plus équitable.

图6 不同场景下的就业人口、居住人口分布
Fig.6 Distributional patterns of working and residential population under different scenarios

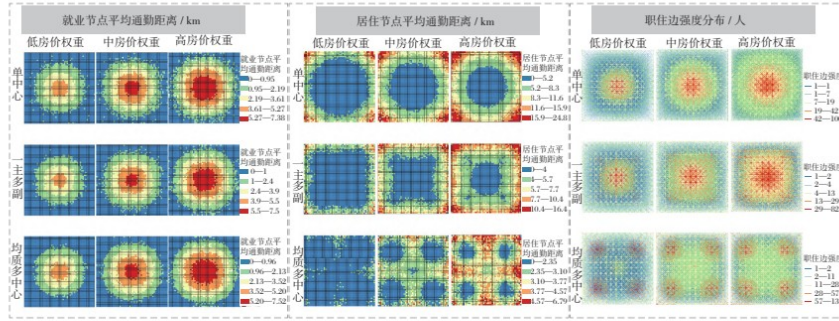


图7 不同场景下的就业节点平均通勤距离、居住节点平均通勤距离及职住边强度
Fig.7 Average commuting distances of employment nodes, residential nodes, and job-housing edge intensity under different scenarios

“一主多副”结构下那样突出。住房价格可接受程度的变化对职住网络的结构特征亦具有一定的影响。尽管这一变化不会直接导致职住网络边的结构特征发生显著改变，但其向心趋势

减弱。
6.2 应对策略
6.2.1 住房价格接受程度提升：多维度策略组合

接受程度提升能直接促进居民就近居住，减少空间平均通勤距离和减弱向心流强度。一是持续强化保障性住房体系建设。针对上海市当前情况，应进一步加大保障性住房的投资与建设力度，确保住房

Fig. 7 Average commuting distances and edge intensity under different scenarios

表1 不同场景下节点平均通勤距离的均值
Tab.1 Mean commuting distance of nodes across scenarios

场景	低房价权重		中房价权重		高房价权重	
	就业节点	居住节点	就业节点	居住节点	就业节点	居住节点
单中心	1.06	5.50	1.68	7.16	2.26	8.26

Tableau 1 Mean node commuting distance across simulation scenarios

1. The ring-based zones are the central activity area inside the Inner Ring, the main city between the Inner and Outer rings, and suburbs outside the Outer Ring. 2. The terms central activity area, main city, and new city follow the Shanghai Master Plan (2017-2035). 3. Comprehensive node city follows the same plan.

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