Navigating mega-regionalization

Engaging Chinese secondary cities towards the coordination of spatial relations

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Yizhao DU

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To my beloved hometown

致 故土

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Summary

Chinese rapid economic growth has long relied on an urban growth pole model, where developmental resources and political attention concentrate in a few leading metropolises in different regions, leaving other cities lagging behind. To address this intra-regional unevenness, national authorities have promoted **mega-regionalization** since 2006 as a new territorial strategy, marking the state's intention to recentralize regional governance to alleviate the disparities between the leading cores and neighboring cities. A mega-region is a spatially connected system of multiple cities, typically anchored by one or two cores, and is expected to function as a platform for integrated economic development, spatial connectivity, and joint governance, enhancing overall regional competitiveness in national or global markets, while also aiming to improve the quality of development by addressing environmental, social, and other sustainability concerns. Within these systems, we conceptualize these non-core, less recognized urban entities as **secondary cities**. While not necessarily small in size, they tend to receive less political attention, attract fewer resources, and remain overshadowed by core city development. The vision of mega-regionalization assumed that **coordinated** spatial governance would improve the functional and political position of these cities, leading to more balanced regional development. However, two decades of practice have not sufficiently alleviated the existing unevenness. These cities are still facing **polarization** challenges, as development resources continue to flow towards cores, and **peripheralization** challenges, as political attention and planning priorities often favor cores, pushing secondary cities to the margins of policy discourse.

This dissertation newly defines the concept of **core-secondary spatial relations** because these relations are central both to the challenges and the potential solutions. They structure how resources, flows, and political influence are distributed within mega-regions. Thus, we reconceptualize Chinese mega-regionalization as a recentralized regional governance process to coordinate core-secondary spatial relations through the initiation and implementation of spatial planning visions.

In this way, we seek to address the main research question: **To what extent can the coordination of core-secondary spatial relations help secondary cities navigate mega-regionalization in the face of polarization and peripheralization?**

To this end, we first typologically classify secondary cities in mega-regions to develop a deeper understanding of their characteristics and specific predicaments, as these cities differ widely in terms of internal characteristics, roles in the mega-region, and types of relations with their cores. Building on this, we select representative cases to examine how core-secondary spatial relations have been coordinated in mega-regional governance processes and how secondary cities have been affected at different scales. At the national authorities' level, we explore what the agenda of "regional coordination" actually entails, namely what policy orientations the state employs to coordinate core-secondary relations aiming to benefit secondary cities. This yields an analytical framework for assessing, at the mega-regional scale, the translation of top-level visionary planning into action plans and, at the local scale, its concrete implementation and practical constraints. These aims are pursued through four sub-research questions:

Sub-question 1: understanding secondary cities (see Chapter 2)

— **In what ways do the challenges of intra-regional unevenness unfold across mega-regions and secondary cities with different characteristics in China?**

Using a typological approach, we classify secondary cities based on their development gaps with their respective cores across several dimensions of spatial development. The analysis returns five types of secondary city in China, three of which reflect problematic core-secondary relations. The first type includes cases where dominant cores are significantly larger in size, leaving surrounding smaller cities highly dependent on the core's development. The second refers to mega-regional contexts where both the cores and their smaller neighbors face joint economic decline. The third type gathers cases where "superstar" cores, such as national capital Beijing, increasingly pull in talent, investment, and industries, causing secondary cities to lose resources and political influence. This typology provides a more nuanced understanding of secondary cities and lays the foundation for exploring differentiated strategies to improve core-secondary coordination and promote more balanced mega-regional development.

Sub-question 2: examining policy orientations at national level (see Chapter 3):

— **What are the policy orientations of mega-regional coordination for secondary cities initiated by national authorities and what governance mismatches, at the theoretical level, prevent their materialization?**

This part of the research focuses on the policy orientations envisioned in Chinese mega-regionalization, in which the national authorities seek to address intra-regional unevenness through recentralized mega-regional governance. We analyze how these top-level visions frame coordination strategies between core and secondary cities, aiming to integrate smaller cities and help them overcome polarization and peripheralization. Using policy analysis of mega-regional planning development documents, we thematically examine coordination visions regarding spatial structure, inter-city linkages, and functional roles. These policy orientations can be deconstructed into three levels:

— **Coexistence:** Core and secondary cities should pursue development without undermining other cities. This includes setting shared development directions, defining complementary roles and divisions of labor, and considering environmental, issues to ensure balanced and sustainable regional growth.
— **Connectivity:** Dense and positive inter-city linkages are essential for coordination. This refers not only to physical infrastructure but also to the flows of information and open markets that enable secondary cities to benefit from regional integration.
— **Cooperation:** Multiple collaboration projects and strategies between core and secondary cities are crucial carriers of coordination. This includes joint industrial platforms, shared public services, innovation partnerships, and other formalized mechanisms for collective problem-solving and coordinated growth.

By combining three classical concepts in regional development including network externalities, inter-city competition and cooperation, and multi-level governance, we identify three theoretical governance mismatches that prevent the materialization of coordinated core-secondary relations in Chinese mega-regions. First, a **place mismatch** arises when the expected spatial reach of network externalities does not correspond to the actual capacities of secondary cities. Second, a **priority mismatch** emerges when the stated objectives of balanced development and complementarity are undermined by entrenched incentive structures privileging competition, enabling core cities to prioritize their own agendas. Third, an **actor mismatch** stems from multi-level governance dynamics: visionary top-down strategies frequently are misaligned with local implementation realities, while uneven political voice and divergent interests between cores and secondary cities. Together, these mismatches highlight the barriers that limit the effectiveness of regional coordination.

Henceforth, the “3-COs” and governance mismatches serve as the conceptual framework for this dissertation, providing analytical tools to investigate how national-level visions are translated through the mega-regional and local governance processes explored in subsequent chapters.

Sub-question 3: planning at mega-regional level (see Chapter 4):

— **To what extent do misalignments in mega-regional scale planning trajectories constrain the pursuit of core-secondary coordination?**

In mega-regionalization, there is a notable **intermediate stage** between national-level visionary plans and local implementation at the scale of individual cities. At this stage, provincial governments act as coordinators, tasked with interpreting broad, often ambiguous national visions and converting them into short-term, actionable plans guiding the implementation at local level, conceptualized here as a **vertical governance trajectory**. However, these initiatives have not effectively alleviated the unevenness between core and secondary cities, which we attribute to governance mismatches, namely, misalignments in the implementation process that have prevented the coordination vision from being successfully spatialized at the local scale. Three key mismatches limit the realization of national coordination visions:

— A vertical **place** mismatch occurs when the top-level assignment of functional and political roles to secondary cities does not align with their actual conditions and capacities.
— A vertical **priority** mismatch reflects conflicting development priorities across governance levels, since national visions stress balanced growth, but mega-regional coordinators often reorient resources toward strengthening the cores, sidelining secondary cities.
— A vertical **actor** mismatch arises from institutional gaps between vision-setters and implementers, as different stakeholders often interpret national plans selectively, leading to fragmented and biased outcomes.

Sub-question 4: planning implementation at city level (see Chapter 5):

— **Through what pathways do secondary cities spatialize the mega-regional vision and what practical obstacles do they face in that process?**

This part of the research focuses on the **horizontal governance trajectory**, which refers to how secondary cities attempt to build collaborative relations with core cities during the local implementation of mega-regional planning. In fact, the concept of **state entrepreneurialism** provides a useful explanation for the efforts made by local actors, here referring to secondary cities, under a state-led vision of regional coordination. These cities actively mobilize entrepreneurial tools to construct relations with core cities. Therefore, this study builds its discussion within this framework, first seeking to understand how secondary cities adapt entrepreneurial strategies to implement the central state's developmental goals within mega-regionalization, and, in turn, to further identify the practical obstacles they face.

We select the city of Handan in the Beijing-Tianjin-Hebei mega-region as a representative case to investigate how a secondary city spatializes mega-regional planning in response to the top-level coordination vision. The local spatialization pathways include, among others, developing industrial platforms, leveraging regional branding, and capturing spillover activities and functions from the dominant core cities. However, these attempts also face horizontal governance mismatches, largely due to the **passiveness** of secondary cities within state entrepreneurialism:

— A horizontal **place** mismatch occurs when secondary cities lack internal capacities to effectively capitalize on the spillover resources from the cores, or the cores lack motivation to provide support.
— A horizontal **priority** mismatch reflects inter-city relations driven by competition rather than cooperation, as both cores and other secondary cities prioritize local growth individually, undermining the collective goals of mega-regional coordination.
— A horizontal **actor** mismatch emerges from the weak political voice of secondary cities, leaving partnership opportunities dependent on selective decisions made by cores or top-level authorities. Favored cities receive more support, while others are further peripheralized.

By exploring these four questions, this research explains why secondary cities often fail to benefit from Chinese mega-regionalization by analyzing governance mismatches along vertical and horizontal dimensions. In **Chapter 6** We link these findings to three classical concepts (network externalities, inter-city competition and cooperation, and multi-level governance) to deepen the theoretical discussion.

Building on this framework, the study proposes targeted recommendations: spatial downscaling and sub-regional clustering to address place mismatches, incentive and control mechanisms to rebalance priorities, and flexible, facilitative institutions to mitigate actor mismatches. In doing so, we demonstrate how a secondary-city perspective enriches debates on mega-regional governance and offers practical insights for more inclusive regional coordination.

This research brings a novel perspective to the study of Chinese mega-regionalization by focusing on the perspective of secondary cities, shifting the attention from core-dominated narratives to the overlooked roles of smaller actors in shaping regional development. Theoretically, it advances the field by constructing a conceptual framework of core-secondary spatial relations and offering new analytical tools to understand how regional governance processes influence intra-regional unevenness. Practically, the research generates policy-relevant insights that can guide coordination strategies towards more context-sensitive approaches for secondary cities, offering references for policymakers and related stakeholders seeking to strengthen the roles of secondary cities and build more balanced mega-regionalization trajectories.

Samenvatting

De snelle economische groei van China heeft lange tijd gesteund op een model van stedelijke groeipolen, waarbij ontwikkelingsmiddelen en politieke aandacht geconcentreerd zijn in enkele leidende metropolen in verschillende regio's, terwijl andere steden achterblijven. Om deze intra-regionale ongelijkheid aan te pakken, hebben nationale autoriteiten sinds 2006 de **mega-regionalisering** gepromoot als een nieuwe territoriale strategie, waarmee de staat de intentie aangaf om het regionale bestuur te recentraliseren teneinde de ongelijkheden tussen de leidende kernsteden en hun naburige steden te verkleinen. Een megaregio wordt opgevat als een ruimtelijk verbonden systeem van meerdere steden, doorgaans verankerd door één of twee kernsteden, en wordt geacht te functioneren als een platform voor geïntegreerde economische ontwikkeling, ruimtelijke connectiviteit en gezamenlijk bestuur, waarbij de algehele regionale concurrentiekracht in nationale of mondiale markten wordt versterkt en tevens de kwaliteit van ontwikkeling wordt verbeterd door aandacht te besteden aan milieu-, sociale en andere duurzaamheidskwesties. Binnen deze systemen conceptualiseren wij deze niet-kernachtige, minder erkende stedelijke entiteiten als **secundaire steden**. Hoewel zij niet noodzakelijk klein zijn in omvang, ontvangen zij doorgaans minder politieke aandacht, trekken zij minder middelen aan en blijven zij overschaduwd door de ontwikkeling van kernsteden. De visie van mega-regionalisering ging ervan uit dat **gecoördineerd** ruimtelijk bestuur de functionele en politieke positie van deze steden zou verbeteren en zou leiden tot een meer evenwichtige regionale ontwikkeling. Twee decennia praktijk hebben de bestaande ongelijkheid echter niet in voldoende mate verminderd. Deze steden worden nog steeds geconfronteerd met **polarisatieproblemen**, aangezien ontwikkelingsmiddelen blijven toestromen naar kernsteden, en met **periferalisatieproblemen**, aangezien politieke aandacht en planningsprioriteiten vaak in het voordeel van kernsteden uitvallen en secundaire steden naar de marges van het beleidsdiscours worden geduwd.

Dit proefschrift definieert het concept van kern-secundaire ruimtelijke relaties opnieuw, omdat deze relaties zowel centraal staan voor de uitdagingen als voor de potentiële oplossingen. Zij structureren hoe middelen, stromen en politieke invloed binnen megaregio's worden verdeeld. Daarom herconceptualiseren wij de Chinese megaregionalisering als een recentraliserend regionaal bestuursproces dat erop gericht is kern-secundaire ruimtelijke relaties te coördineren via de initiatie en implementatie van ruimtelijke planningsvisies. Op deze manier trachten wij de

centrale onderzoeksvraag te beantwoorden: **In welke mate kan de coördinatie van kern-secundaire ruimtelijke relaties secundaire steden helpen zich te positioneren binnen de megaregionalisering in het licht van polarisatie en periferalisatie?**

Daartoe classificeren wij eerst typologisch de secundaire steden binnen megaregio's om een dieper inzicht te krijgen in hun kenmerken en specifieke problemen, aangezien deze steden sterk uiteenlopen wat betreft interne eigenschappen, hun rol in de megaregio en het type relatie met hun kernsteden. Op basis hiervan selecteren wij representatieve casussen om te onderzoeken hoe kern-secundaire ruimtelijke relaties in megaregionale bestuursprocessen zijn gecoördineerd en hoe secundaire steden op verschillende schalen zijn beïnvloed. Op het niveau van de nationale autoriteiten analyseren wij wat de agenda van "regionale coördinatie" in feite inhoudt, namelijk welke beleidsoriëntaties de staat hanteert om kern-secundaire relaties te coördineren met als doel de secundaire steden te laten profiteren. Dit levert een analytisch kader op om op megaregionaal niveau de vertaling van top-down visionaire planning naar actieplannen en, op lokaal niveau, de concrete uitvoering en praktische beperkingen te beoordelen. Deze doelstellingen worden nagestreefd door middel van vier deelonderzoeksvragen:

Deelvraag 1: het begrijpen van secundaire steden (zie Hoofdstuk 2)

— **Op welke manieren manifesteert de uitdaging van intra-regionale ongelijkheid zich binnen megaregio's en secundaire steden met verschillende kenmerken in China?**

Met behulp van een typologische benadering classificeren wij secundaire steden op basis van hun ontwikkelingsachterstand ten opzichte van hun respectieve kernsteden langs verschillende dimensies van ruimtelijke ontwikkeling. De analyse levert vijf typen secundaire stad in China op, waarvan er drie problematische kern-secundaire relaties weerspiegelen. Het eerste type omvat gevallen waarin dominante kernsteden aanzienlijk groter zijn in omvang, waardoor omliggende kleinere steden sterk afhankelijk blijven van de ontwikkeling van de kern. Het tweede type verwijst naar megaregionale contexten waarin zowel de kernsteden als hun kleinere buren met gezamenlijke economische neergang worden geconfronteerd. Het derde type verzamelt gevallen waarin "superster"-kernen, zoals de nationale hoofdstad Beijing, in toenemende mate talent, investeringen en industrieën aantrekken, waardoor secundaire steden middelen en politieke invloed verliezen. Deze typologie biedt een meer genuanceerd begrip van secundaire steden en vormt de basis voor het verkennen van gedifferentieerde strategieën om de kern-secundaire coördinatie te verbeteren en een meer evenwichtige megaregionale ontwikkeling te bevorderen.

Deelvraag 2: het onderzoeken van beleidsoriëntaties op nationaal niveau (zie Hoofdstuk 3)

— **Wat zijn de beleidsoriëntaties van megaregionale coördinatie voor secundaire steden die door nationale autoriteiten worden geïnitieerd, en welke governance-mismatches, op theoretisch niveau, verhinderen hun realisatie?**

Dit onderdeel van het onderzoek richt zich op de beleidsoriëntaties die in de Chinese megaregionalisering zijn verwoord, waarin de nationale autoriteiten trachten de intra-regionale ongelijkheid aan te pakken door middel van recentraliseerd megaregionaal bestuur. Wij analyseren hoe deze top-down visies de coördinatiestrategieën tussen kern- en secundaire steden inkaderen, met als doel kleinere steden te integreren en hen te helpen polarisatie en periferalisatie te overwinnen. Aan de hand van beleidsanalyse van ontwikkelingsdocumenten voor megaregionale planning onderzoeken wij thematisch de coördinatievisies met betrekking tot de ruimtelijke structuur, interstedelijke verbindingen en functionele rollen. Deze beleidsoriëntaties kunnen worden gedifferentieerd in drie niveaus:

— **Co-existentie:** Kern- en secundaire steden dienen ontwikkeling na te streven zonder andere steden te ondermijnen. Dit omvat het vaststellen van gedeelde ontwikkelingsrichtingen, het definiëren van complementaire rollen en taakverdelingen, en het in aanmerking nemen van milieukwesties om zo evenwichtige en duurzame regionale groei te waarborgen.
— **Connectiviteit:** Dichte en positieve interstedelijke verbindingen zijn essentieel voor coördinatie. Dit verwijst niet alleen naar fysieke infrastructuur, maar ook naar informatiestromen en open markten die secundaire steden in staat stellen te profiteren van regionale integratie.
— **Coöperatie:** Meervoudige samenwerkingsprojecten en -strategieën tussen kern- en secundaire steden vormen cruciale dragers van coördinatie. Dit omvat gezamenlijke industriële platforms, gedeelde publieke diensten, innovatiepartnerschappen en andere geformaliseerde mechanismen voor collectieve probleemoplossing en gecoördineerde groei.

Door drie klassieke concepten in regionale ontwikkeling te combineren-namelijk netwerkeffecten, interstedelijke competitie en samenwerking, en multi-level governance-identificeren wij drie theoretische governance-mismatches die de realisatie van gecoördineerde kern-secundaire relaties in Chinese megaregio's verhinderen. Ten eerste ontstaat er een **plaatsmismatch** wanneer de veronderstelde ruimtelijke reikwijdte van netwerkeffecten niet overeenkomt met de werkelijke capaciteit van secundaire steden. Ten tweede doet zich een **prioriteitsmismatch**

voor wanneer de beoogde doelstellingen van evenwichtige ontwikkeling en complementariteit worden ondermijnd door diepgewortelde prikkelstructuren die competitie bevoordelen, waardoor kernsteden hun eigen agenda's kunnen prioriteren. Ten derde vloeit een **actormismatch** voort uit de dynamiek van multi-level governance: visionaire top-down strategieën sluiten vaak niet aan bij lokale implementatierealiteiten, terwijl een ongelijke politieke stem en uiteenlopende belangen tussen kern- en secundaire steden effectieve coördinatie belemmeren. Gezamenlijk benadrukken deze mismatches de barrières die de effectiviteit van regionale coördinatie beperken.

Voortaan vormen de "drie CO's" en de governance-mismatches het conceptuele kader van dit proefschrift, dat analytische instrumenten biedt om te onderzoeken hoe nationale visies worden vertaald in de megaregionale en lokale governanceprocessen die in de volgende hoofdstukken worden behandeld.

Deelvraag 3: planning op megaregionaal niveau (zie Hoofdstuk 4)

— **In welke mate beperken misalignments in planningstrajecten op megaregionale schaal de realisatie van kern–secundaire coördinatie?**

Binnen de megaregionalisering bestaat er een duidelijk **intermediair stadium** tussen de nationale visionaire plannen en de lokale uitvoering op het niveau van individuele steden. In deze fase treden provinciale overheden op als coördinatoren, belast met het interpreteren van brede, vaak ambigue nationale visies en het omzetten daarvan in kortetermijn, uitvoerbare plannen die de implementatie op lokaal niveau sturen – hier geconceptualiseerd als een **verticale governance-traject**. Deze initiatieven hebben echter de ongelijkheid tussen kern- en secundaire steden niet effectief verminderd, hetgeen wij toeschrijven aan governance-mismatches, namelijk misalignments in het implementatieproces die verhinderen dat de coördinatievisie succesvol wordt verankerd in de lokale ruimtelijke praktijk. Drie kernmismatches beperken de realisatie van nationale coördinatievisies:

— Een verticale **plaatsmismatch** doet zich voor wanneer de toewijzing van functionele en politieke rollen aan secundaire steden op nationaal niveau niet in overeenstemming is met hun feitelijke omstandigheden en capaciteiten.
— Een verticale **prioriteitsmismatch** weerspiegelt conflicterende ontwikkelingsprioriteiten tussen bestuursniveaus: nationale visies benadrukken evenwichtige groei, maar megaregionale coördinatoren heroriënteren middelen vaak naar de versterking van de kernsteden, waardoor secundaire steden opzij worden geschoven.

— Een verticale **actormismatch** ontstaat door institutionele hiaten tussen visiebepalers en uitvoerders, aangezien verschillende belanghebbenden nationale plannen vaak selectief interpreteren, wat leidt tot gefragmenteerde en bevooroordeelde uitkomsten.

Deelonderzoeksvraag 4: Implementatie van planning op stadsniveau (zie Hoofdstuk 5)

— **Langs welke trajecten trachten secundaire steden de megaregionale visie ruimtelijk vorm te geven? En met welke praktische obstakels worden zij geconfronteerd in dit ruimtelijkiseringsproces?**

Dit deel van het onderzoek richt zich op het **horizontale governance-traject**, dat verwijst naar de wijze waarop secundaire steden proberen samenwerkingsrelaties met kernsteden op te bouwen tijdens de lokale implementatie van megaregionale planning. Het concept van **state entrepreneurialism** biedt in dit opzicht een bruikbare verklaring voor de inspanningen van lokale actoren, hier verwijzend naar secundaire steden, binnen een door de staat geleide visie op regionale coördinatie. Deze steden mobiliseren actief ondernemerschapsinstrumenten om relaties met kernsteden te construeren. Daarom wordt de verdere analyse binnen dit analytische kader geplaatst, waarbij eerst wordt onderzocht hoe secundaire steden ondernemerschapsstrategieën aanpassen om de ontwikkelingsdoelen van de centrale staat binnen het proces van megaregionalisering te implementeren, en vervolgens welke praktische obstakels zij daarbij tegenkomen.

Als empirische casus selecteren wij de stad Handan in de megaregio Beijing-Tianjin-Hebei, om te analyseren hoe een secundaire stad megaregionale planning ruimtelijk vertaalt in reactie op de coördinatievisie op topniveau. Deze lokale ruimtelijke vertalingspaden omvatten onder meer het ontwikkelen van industriële platforms, het benutten van regionale branding en het aantrekken van overloopactiviteiten en -functies vanuit de dominante kernsteden. Deze pogingen worden echter blijvend geconfronteerd met horizontale mismatches, grotendeels als gevolg van de **passieve positie** van secundaire steden binnen state entrepreneurialism:

— Een horizontale **plaatsmismatch** doet zich voor wanneer secundaire steden interne capaciteiten missen om effectief te profiteren van de spillover-effecten van de kernsteden, of wanneer de kernsteden onvoldoende gemotiveerd zijn om steun te verlenen.
— Een horizontale **prioriteitsmismatch** weerspiegelt interstedelijke relaties die meer door competitie dan door samenwerking worden gedreven, aangezien zowel kern- als andere secundaire steden hun lokale groei individueel prioriteren, waardoor de collectieve doelstellingen van megaregionale coördinatie worden ondermijnd.

— Een horizontale **actormismatch** ontstaat uit de zwakke politieke stem van secundaire steden, waardoor partnerschapsmogelijkheden afhankelijk blijven van selectieve beslissingen van kernsteden of hogere autoriteiten. Bepaalde steden die de voorkeur krijgen ontvangen meer steun, terwijl andere verder worden gemarginaliseerd.

Door deze vier vragen te onderzoeken verklaart dit onderzoek waarom secundaire steden vaak niet profiteren van de Chinese megaregionalisering, door governance-mismatches langs verticale en horizontale dimensies te analyseren. In Hoofdstuk 6 verbinden wij deze bevindingen met drie klassieke concepten (netwerkeffecten, interstedelijke competitie en samenwerking, en multi-level governance) om de theoretische discussie te verdiepen. Op basis van dit kader formuleert de studie gerichte aanbevelingen: ruimtelijke downsizing en subregionale clustering om plaatsmismatches te verhelpen, incentive- en controlmechanismen om prioriteiten te herijken, en flexibele, faciliterende instituties om actormismatches te beperken. Daarmee tonen wij aan hoe een secundaire-stedenperspectief de debatten over megaregionaal bestuur verrijkt en praktische inzichten biedt voor meer inclusieve regionale coördinatie.

Dit onderzoek introduceert een nieuw perspectief op de studie van de Chinese megaregionalisering door uit te gaan van het perspectief van secundaire steden en de aandacht te verschuiven van kern-gedomineerde narratieven naar de vaak over het hoofd geziene rollen van kleinere actoren in regionale ontwikkeling. Theoretisch draagt het bij door een conceptueel kader van kern–secundaire ruimtelijke relaties te construeren en nieuwe analytische instrumenten te bieden om te begrijpen hoe regionale governanceprocessen de intra-regionale ongelijkheid beïnvloeden. Praktisch genereert het onderzoek beleidsrelevante inzichten die coördinatiestrategieën kunnen sturen naar meer contextgevoelige benaderingen voor secundaire steden, en zo referentiepunten bieden voor beleidsmakers en andere belanghebbenden die de rol van secundaire steden willen versterken en meer evenwichtige trajecten van megaregionalisering willen opbouwen.

总结

中国的快速经济增长长期依赖于“增长极”发展模式，即将发展资源与政治关注高度集中于少数领先的大都市，导致其他中小城市在发展进程中处于相对滞后的地位。为缓解这种区域内的发展不均衡，自2006年起，国家开始推动城市群建设，作为一项新的国土空间治理战略，期待通过区域治理的再中心化，协同核心城市与周边中小城市之间关系，从而缩小区域发展差距。“城市群”是指由多个城市构成的区域网络系统，通常由一个或两个核心城市主导，其功能在于通过促进经济一体化、加强空间互联互通与推动联合治理，提升区域整体在国家乃至全球市场中的竞争力。在这一系统中，本文将非核心、认知度较低的城市界定为“次级城市”。尽管它们在人口或经济体量上并不一定较小，但往往缺乏政治关注，资源吸引力较弱，发展过程中易被边缘化。城市群的治理设想认为，通过加强核心与次级城市之间的协同，能够提升后者在区域体系中的功能定位与政治地位，从而推动更为均衡的区域发展。然而，经过近二十年的政策实践，这一战略在缓解区域不均衡方面的成效仍不显著。次级城市依然面临两大困境：一是极化问题，即发展资源持续向核心城市集中，加剧区域内部差距；二是边缘化问题，即政治关注与规划优先权依然偏向核心城市，致使次级城市在政策话语体系中被长期边缘化。

本论文聚焦于核心-次级城市的空间关系，因为它们既是问题的根源所在，也是潜在解决路径的核心。这种空间关系塑造了城市群内部资源、流动与政治影响力的分配格局。本文将中国的城市群化重新概念化为一种再集中化的区域治理过程，通过空间规划愿景的提出与实施来协同核心-次级城市的空间关系。由此，本文试图回答核心研究问题：在极化与边缘化的双重挑战下，核心-次级城市空间关系的协同如何帮助次级城市应对城市群化进程？

为此，本文首先对城市群内部的次级城市进行类型划分，以更深入地理解其特征及具体困境。在此基础上，选择具有代表性的案例，考察在城市群化进程中核心-次级城市空间关系是如何被协同的，以及这一治理过程在不同尺度上对次级城市产生了何种影响。在国家层面，本文探讨“区域协同”的实际内涵，即国家在协同核心-次级关系、以惠及次级城市方面所采取的政策导向。由此，构建出一个分析框架，以评估在城市群尺度上，高层愿景规划的转译过程，以及在地方尺度上的具体落实与现实制约。这一研究目标通过以下四个子研究问题加以实现：

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子研究问题一：理解次级城市（见第二章）

- 在中国，不同特征的次级城市在城市群中，区域发展不均衡的挑战以何种方式呈现？

本研究采用类型学方法，根据各城市与其核心之间在高质量发展的多个维度上的发展差距，对次级城市进行分类。分析结果表明，中国的次级城市可分为五类，其中三类反映了具有代表性的失衡核心–次级关系。第一类是核心城市在规模上显著大于周边小城市的类型，使得后者对核心的发展高度依赖。第二类指核心与邻近小城市共同面临经济衰退的区域。第三类是“超级明星”核心（如国家首都北京）不断吸引人才、投资和产业，导致次级城市丧失资源与政治影响力。该类型学为理解次级城市提供了更深入的视角，并为探索差异化的核心–次级协同策略奠定了基础，从而促进更均衡的城市群发展。

子研究问题二：国家层面的政策导向（见第三章）

- 国家发起的城市群协同倡议中，针对次级城市的政策导向是什么？又存在哪些可能阻碍这些倡议落地的治理错配？

本研究的这一部分聚焦于中国城市群发展的政策导向，即国家试图通过再中心化的城市群治理来应对区域内部发展不均衡问题。本文分析这些顶层愿景如何框定核心-次级城市间的协同，旨在推动小城市融入区域体系，帮助其应对极化与边缘化。通过对官方城市群规划发展的政策分析，本文从主题上探讨了协同在空间结构、城市间联系以及功能分工等方面的愿景。政策导向可解构为三个层面：

- 共生：核心与次级城市应在不以牺牲其他城市利益为代价的前提下共同发展。这包括确立共同的发展方向，明确互补的角色与分工，并将环境、生态与气候等因素纳入考量，以确保区域发展的均衡性与可持续性。
- 共联：密切且正向的城市间联系是实现协同的关键。这不仅涉及物理基础设施，还包括信息流通与开放市场的建设，从而使次级城市能够从区域一体化中获益。
- 共建：核心与次级城市间的多样化合作项目与策略是实现协同的重要载体，包括联合产业平台、公共服务共享、创新合作伙伴关系以及其他正式化的集体问题解决与协同发展机制。

通过结合区域发展中的三个经典概念，包括网络外部性、城市间竞争与合作和多层级治理，本文从理论层面识别出三类治理错配，阻碍了核心–次级协同关系的落实。第一是空间禀赋错配，即预期的网络外部性空间效应与次级城市的实际吸收能力不符。第二是优先次序错配，即均衡发展的既定目标被固化的激励机制所破坏，后者往往倾向于竞争，使核心城市得以优先推进自身议程。第三是治理主体错配，源于多层级治理的动态：顶层的宏观愿景常常与地方的实施现实不符，同时核心与次级之间的不平等

政治话语权和分化的利益诉求阻碍了有效协同。这些错配共同揭示了限制区域协同效果的障碍。自此，本论文将“三共”与治理错配作为核心概念框架，为探讨国家愿景如何在城市群与地方治理过程中被转译提供分析工具。

子研究问题三：城市群层面规划（见第四章）

- 城市群尺度的规划路径中存在哪些错配，限制了核心–次级协同的实现？

在城市群化过程中，国家层面的愿景规划与地方实施之间存在一个显著的中间阶段。在这一阶段，省级政府作为协同者，负责解读往往宏观且模糊的国家愿景，并将其转化为短期、可操作的计划，以指导地方层面的落实。本文将此阶段概念化为纵向治理路径。然而，这些看似有前景的规划举措并未有效缓解核心与次级城市之间的不均衡。本文将其归因于治理错配，即在实施过程中存在的不匹配，阻碍了协同愿景在地方尺度上的有效空间化。在纵向维度上，三类关键错配限制了国家协同愿景的实现：

- 纵向职能错配：国家层面对次级城市赋予的功能与政治角色与其实际条件和能力不符。
- 纵向优先错配：治理层级间发展优先事项存在冲突，国家愿景强调均衡发展，而城市群协同者往往将资源重新导向强化核心城市，从而边缘化次级城市。
- 纵向主体错配：区域愿景制定者与执行者之间的制度性鸿沟导致不同利益相关方对国家规划的选择性解读，从而造成碎片化的落实结果。

子研究问题四：城市尺度的规划实施（见第五章）

- 次级城市通过何种路径将城市群愿景空间化？在空间化过程中又面临哪些现实障碍？

本研究的这一部分聚焦于横向治理路径，即次级城市在城市群规划的地方实施过程中，如何尝试与核心城市建立协作关系。国家创业主义（State Entrepreneurialism）这一概念，为在国家主导的区域协同发展愿景下地方行动者（此处主要指次级城市）所作出的努力提供了有力的解释。在这一框架中，次级城市积极动用各类创业型治理工具，以构建其与核心城市之间的关系。因此，本文在该分析框架下展开进一步讨论，首先探讨次级城市如何通过调整创业型策略，在城市群化进程中落实中央国家的发展目标，进而识别其在实践中所面临的现实障碍。

本文选取京津冀城市群中的邯郸市作为代表性案例，分析次级城市如何在顶层协调愿景的引导下，对城市群规划进行空间化回应。其地方层面的空间化路径包括但不限于：建设产业平台、运用区域品牌策略，以及承接来自主导性核心城市的外溢活动与功能。然而，这些努力始终受到横向错配的制约，其根源在于次级城市在国家创业主义框架中的被动地位：

- 横向职能错配：次级城市缺乏有效利用核心城市溢出资源的内部能力，核心城市缺乏提供支持的动机。
- 横向优先错配：城市间关系依然由竞争而非合作驱动，无论是核心城市还是其他次级城市，都倾向于优先追求自身增长，从而削弱了城市群协同的整体目标。
- 横向主体错配：次级城市的政治话语权较弱，合作机会往往取决于核心城市或上级政府的选择性决策。受青睐的城市会获得更多支持，而其他城市则进一步被边缘化。

通过探讨上述四个子问题，本研究解释了次级城市为何常常无法从中国的城市群化中获益，其原因在于纵向与横向治理维度上的治理错配。在第六章中，我们将这些发现与区域发展中的三个经典概念（网络外部性、城市间竞争与合作、多层级治理）联系起来，以深化理论讨论。基于这一框架，研究提出了针对性的政策建议：通过空间尺度下调与次级城市集群构建来缓解空间错配；通过激励与调控机制来重新平衡优先次序；通过灵活且促进性的制度安排来缓解行为者错配。由此，本研究展示了次级城市视角如何能够丰富关于城市群治理的学术讨论，并为实现更具包容性的区域协同提供实践启示。

本研究通过聚焦次级城市，为中国城市群化研究提供了全新的视角，将关注点从以核心城市为主导的叙事，转向被忽视的小型城市主体在区域发展中的作用。理论上，本文通过构建核心-次级空间关系的概念框架，丰富了理解区域治理过程如何影响区域内部发展不均衡的分析工具。实践上，本研究为制定更具情境敏感性的协同策略提供了政策相关的启示，从次级城市视角为政策制定者及相关利益方在强化次级城市作用、构建更加均衡的城市群化路径方面提供了参考。

An intersection in central downtown of Handan. This area concentrates key urban functions, including a large shopping mall, a cultural center, a museum, and civic squares. It represents the core urban district of a typical Chinese secondary city and reflects everyday urban life.

City center of Handan, photographed by Kaixuan Wen.

TOC

1 Introduction

Engaging secondary cities towards coordinated mega-regionalization

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ABSTRACT Mega-regional unevenness, namely the development gap between core cities and smaller cities, has become a key obstacle for inter-city coordination in China. Scholars tend to focus on the leading role of the cores in responding to this problem. When smaller cities are mentioned, their endogenous characteristics and weaknesses are often highlighted, rather than their value as important nodes in the regional network capable of building inter-city relations. This research conceptualizes these smaller players in mega-regional systems as "**secondary cities**" to emphasize their relational positioning towards the cores, aiming to reflect on the challenges of inter-city unevenness and the impact of mega-regionalization on such dynamics. Based on this, in this chapter we outline the key components that frame this PhD project. We begin by introducing the main research focus and the theoretical underpinning, namely why we should explore secondary cities and how they are conceptualized in Chinese mega-regionalization. We then provide a historical review of mega-regionalization from the perspective of secondary cities, followed by an overview of the uneven development challenges they currently face. Finally, we present the problem and clarify the aims and significance of the research. Framing the research lens on **core-secondary spatial relations**, we conceptualize mega-regionalization as a recentralized regional governance process to coordinate core-secondary spatial relations and respond to intra-regional unevenness. In this way, this dissertation addresses the main research question: **to what extent can the coordination of core-secondary spatial relations help secondary cities to navigate mega-regionalization in the face of polarization and peripheralization challenges?**

1.1 Problem focus: intra-regional unevenness in the Chinese mega-regional system

Regional unevenness has always been recognized as an important obstacle to sustainable urbanization in China. Since the reform and opening up in 1978, the authorities have looked to the eastern coastal cities as national growth poles, resulting in a considerable disparity between coastal and inland areas (Fan & Sun, 2008; Ke & Feser, 2010). Subsequently, marketization, globalization, and decentralization of economic development power have stimulated cities' ambitions for rapid economic rise, leading to fierce inter-city competition (Huang & Wei, 2019). Since then, regional unevenness has been defined by two dimensions: the gap between sub-national geographic parts (i.e., inter-regional unevenness between Eastern coastal areas and Western inland areas) and inter-city disparities (Fan & Sun, 2008; Wei et al., 2020). Since the beginning of the millennium, authorities have pinned their expectations on emerging inland growth poles to cope with unevenness, whose successful rise represents the alleviation of overall inter-regional disparities (Li, 2015; Ye et al., 2024). However, another critical problem has been overlooked: **inter-city** *(or intra-regional)* **unevenness**, since these cores are not only better endowed internally than other nearby cities but are also externally favored by growth pole policies, widening the disparities with their smaller neighbors.

To address this problem, the leading role of the cores in joint development is emphasized by envisioning closer partnerships between cities of different sizes to share preferential policies, markets, and resources (Wu, 2016; Ye et al., 2019). Accordingly, the concept of **mega-regions** (**chengshiqun** *in Chinese*) became the main spatial carrier of future Chinese urbanization, initiated by the authorities in 2006 (CNDRC, 2006). This new spatial unit often consists of one or two cores and several smaller cities in the same region, which are connected through planning schemes, transportation infrastructure, and open markets to create a coherent urban system (Li & Wu, 2020; Yeh & Chen, 2020). Despite their enormous size and significant spatial diversity, such regional systems are also widely referred to as urban agglomerations (Fu & Zhang, 2020), emphasizing the concentration of socio-economic activities within the geographies of extensive urbanization. In this research, we explore these systems from a spatial governance perspective, focusing on how various actors, including authorities and markets, promote regional development. Accordingly, we adopt the term mega-region, aligning with the terminology used in foundational studies (e.g. Harrison & Gu, 2021).

Mega-regionalization has long been entrusted with addressing intra-regional unevenness. Cores are required to support the development of neighboring cities towards a cooperative rather than competitive polycentric regional system (Wu, 2016), meaning that all cities can gain important functional positions and benefit from connecting with other cities (Ji & Yuan, 2023). However, previous studies remain overly focused on either the overall mega-regional governance process or the functional role of the cores in tackling unevenness, for example, through the transfer of redundant heavy industries to the periphery, and leading planning implementation (Luo & Shen, 2009; Xu & Yeh, 2013). The role and value of other smaller cities in this system, conceptualized here as **secondary cities**, are neglected.

Secondary cities and their potential to contribute to a more balanced regional system have been widely recognized in Western literature, which examined their innovation capacity, social vitality, and functional complementarity (Mayer et al., 2021; Johnson, 2021). The opportunity for these smaller cities to develop through spatial, functional, or institutional integration with nearby large cities is now widely regarded as the standard answer to the problem of intra-regional unevenness (Hauswirth et al., 2003; Nelles, 2013). In China, by contrast, secondary cities are widely recognized as facing inherent challenges, including urban shrinkage, industrial decline, and a loss of social vitality (Hu et al., 2021; Yang & Pan, 2020).

However, by analyzing the conditions of singular secondary cities, these studies miss the significant impacts of the network of relations within mega-regions as the fundamental context. Importantly, inter-city relations (especially between core and secondary cities) can explain the origins of regional unevenness: it is difficult for secondary cities to gain from mega-regionalization because of the considerable resource concentration gap compared with the mega-regional cores. As a result, supportive and balanced core-secondary relations are crucial for these smaller players to survive in such a system.

This vision of emerging and mutually beneficial inter-city relations is the reason why Chinese mega-regionalization is considered a crucial national policy to address unevenness, for instance through encouraging cooperative economic and industrial projects or joint governance to manage common risks regionally across cores and smaller cities (Li et al., 2022; Su et al., 2017). However, the overemphasis on the cores in these processes, both as regional economic engines and policy decision-makers, has left secondary cities neglected.

Based on this, we argue that addressing the intra-regional unevenness experienced by secondary cities requires (re)positioning these smaller players within the mega-regional network, rather than viewing their developmental challenges in isolation, and emphasizing their relational interaction with core cities. In this way, we foreground **core-secondary spatial relations** as a fundamental analytical lens. This is because, first, the concept of secondary cities is inherently relational, highlighting their subordinate position to core cities within a regional system. Second, inter-city spatial relations constitute a fundamental component of mega-regional formations, with scholars extensively discussing multidimensional interactions between cities across morphological, inter-city flow, and functional aspects (Meijers & Burger, 2017). Finally, reflecting on intra-regional unevenness essentially underscores the developmental disparities between core and secondary cities, thus, focusing on core-secondary relations offers a direct and effective lens on the unevenness problem. In summary, in this research we focus on four interrelated themes:

Intra-regional unevenness in China:

This refers to the disparities in development among cities within the same or adjacent regions. These disparities are not limited to economic dimensions but also encompass social vitality, innovation capacity, sustainability transitions, and so on. Such indicators fundamentally shape a city's political recognition, social attractiveness, and economic competitiveness, and they largely account for the development gaps between core and secondary cities, which form the basis for distinguishing the two.

The impact of mega-regionalization on intra-regional unevenness:

This research is not necessarily concerned about unevenness at the mega-regional scale, but rather how the process of mega-regionalization shapes such unevenness: whether by exacerbating existing gaps or offering potential approaches for mitigation. Although national authorities have "created" 19 mega-regions across China through spatial planning, these are often understood more as planning imaginaries than functionally integrated urban regions (Harrison & Gu, 2021). Therefore, intra-regional disparities among cities that long predate the institutionalization of mega-regional concepts tend to remain.

Mega-regional secondary cities:

Secondary cities are herein regarded as non-core, smaller-scale cities with lower administrative status within mega-regions. Due to the dominance of growth pole strategies in the Chinese development model over the past decades, these cities have often been overlooked. By focusing on them, this research seeks to reflect critically on their developmental constraints and the extent to which mega-regionalization offers them meaningful opportunities to address such disparities.

Core-secondary spatial relations:

A mega-region is essentially a constellation of inter-city spatial relations that span functional networks, administrative hierarchies, market flows, and more. These spatial relations are fundamental to generating positive externalities but are also responsible for producing agglomeration shadows. The concept of the "secondary city" is inherently relational, not defined in isolation, but implying a deep interdependence between these cities and mega-regional cores.

Based on this, we first formulate the preliminary research question: **how does mega-regionalization influence the trajectories of secondary cities in addressing the challenges of mega-regional unevenness?** In this chapter, we review the concepts and theories related to mega-regionalization and secondary cities, and examine the historical evolution of this process in China. This helps us identify the specific problems of secondary cities (see **Section 1.4**), construct a concrete research lens (see **Section 1.5**), and develop the final research question (see **Section 1.6**).

1.2 Theoretical underpinning

1.2.1 Secondary cities: a concept based on inter-city spatial relations

Scholars increasingly focus on secondary cities to denote a variety of associated concepts. For example, Manchester and Philadelphia have been studied as national secondary cities in relation to London and New York, respectively by developing independent agency and specific strengths to integrate and benefit from globalization (Hodos, 2011). There is a growing interest in defining "second-tier cities" based on their performance in various functional dimensions (GaWC, 2022). The emergence of these concepts implies that the classification of city levels is not only based on size but also on inter-city socio-economic networks (Cardoso, 2023; Sluka et al., 2019). Size-related functional capacities and political roles have also become noteworthy factors in differentiating city levels (Dattagupta, 2017; Hodos, 2007; Kaufmann et al., 2016).

Turning to the regional scale, research suggests that the interaction between cities and the associated restructuring of their spatial configurations progressively strengthens inter-city socio-economic relations through infrastructural linkages, industrial transfers, and population mobility. This is often considered a trigger of "city-regionalization" as the core city upgrades its functional role to form a regional system by relocating redundant or strategic functions to the smaller neighbors, thus providing them more development resources (Scott, 2001; Vogel et al., 2010). In alternative to this core-periphery redistribution model, secondary cities (or secondary city alliances) can also generate new functional roles that do not depend on the core city agenda. This is more visible in city-regions where a dominant core is absent or where political agreements have allowed a more balanced system of functional autonomy (Cardoso and Meijers, 2016, 2017).

In this process, and compared to large and functionally heterogeneous core cities, secondary cities can be roughly regarded as smaller in size, and either more specialized or more vulnerable in terms of functional and political roles. Intuitively, they can be described in the vague but well-understood sense of "*other cities, the less recognized, less celebrated cities, and located next to the famous cities that gather all the attention*" (Pendras & Williams, 2021). In the context of Chinese mega-regionalization, we use the term "secondary" to emphasize the interaction and dependence of these cities on the cores in the regional network, rather than just on their ranking in particular indicators.

According to Pendras and Williams (2021), “secondness” is mainly reflected at the intra-regional scale. That is, cities are “secondary” to their associated cores, spatially and functionally closely related to these dominant players but they usually retain independent cultural and symbolic identities. Functionally, competition largely shapes these inter-city relations, especially in attracting investment, and cores tend to have a better chance of capturing these resources and becoming winners in the regionalization game (Jonas, 2012). A functional hierarchy therefore emerges in which, for example, accommodating low-end industries evacuated from the cores reflects one of the dimensions of being a (regional) secondary city (Aguilar, 2002). As political and economic interests gravitate towards each other, this hierarchy tends to be reflected at the institutional level, and core city policy agendas tend to have a greater voice than secondary city priorities in political decision-making (Li & Jonas, 2023).

1.2.2 Clarifying core-secondary relations

About the “relations”

Simply put, “inter-city spatial relations” can be understood as the interactions among functionally interrelated cities in a region arising from socio-economic activities such as spatial agglomeration, industrial relocation, and population migration. Burger et al. (2014a) identify the transformation of these relations as key to overcoming the challenges of an unevenly polarized region, namely from a “hierarchical system” in which the dominance of the core city is consolidated to a “network system” in which polycentricity fosters positive interactions among cities. Following this, we summarize such relations into two aspects.

The first is the **spatial structure**, which refers to how the regional spatial configuration is shaped by core-secondary relations regarding their morphological structure (uni-nodal or multi-nodal), orientation of functional flows (uni-directional or multi-directional), and overall spatial arrangement (monocentric or polycentric). The second aspect involves the **functional ties** between cities. This encompasses aspects such as economic specialization and economic externalities among cities. They may engage in competition fighting for local interests or cooperation towards regional complementarity of various functional roles. In a hierarchical system, the distribution of economic functions is often determined by the dominance of the core city, with high-end economic sectors concentrated and limited positive interactions with surrounding smaller cities. Consequently, positive economic externalities tend

to be limited to the cores. In a network system, cities play similarly significant but differentiated functional roles, relying on their positions within the network and a division of labor. As a result, economic externalities are more widely distributed.

About the (re)structuring of the "relations"

We argue that core-secondary spatial relations are both the culprit of unevenness and the key factor for addressing this issue. Dealing with uneven relations and fostering beneficial interactions have become crucial approaches for building a balanced and efficient regional system. Scholars have summarized two dimensions driving these relations (Hodos, 2007; Kaufmann et al., 2016; Scott, 2001). The first is **political positioning**. We interpret this as privileging certain cities with greater development potential through preferential policies. Regarding the spatial structure, this is reflected in the attempt to control city size, to form one primary core and/or define the hierarchy of the polycentric system; Regarding economic ties, it involves assigning specific economic dominance to certain cities (Xu & Yeh, 2005). This is usually a political choice that goes beyond marketization and often aims to empower the cores as growth machines to maintain the competitiveness of the region as a whole (Crouch & Le Galès, 2012).

A second dimension entails **functional positioning**. Functional differences consolidate the position of cores in the regional system by perpetuating their roles as financial centers, transportation hubs, innovation gateways, and investment attraction engines (Hanssens et al., 2014). Secondary cities are in a weaker position; while they have the possibility of taking advantage of the larger market of the cores in a closely integrated regional network, persistent functional weaknesses make them lose their competitiveness. This is well explained by the comparative concepts of borrowed size and agglomeration shadow, which suggests that enhancing the functional position of secondary cities is an effective approach for building a polycentric regional system. This is primarily reflected in guiding spatial flows and leveraging beneficial economic externalities (Meijers & Burger, 2017).

1.2.3 Defining secondary cities in the Chinese mega-regional system

Mega-regionalization in China

In the Chinese context, mega-regions are often composed of one or two core cities and several ordinary prefecture-level cities located beyond its administrative boundaries (Yeh & Chen, 2020), which we define as mega-regional secondary cities. More precisely, we focus on secondary cities at the scale of mega-regions, not metropolitan areas (for example, the satellite towns surrounding the metropolitan core in Greater Beijing), or national-scale "second-tier cities" based on the ranking of their economic attractiveness of cities, such as Wuhan (Yicai, 2024). Accordingly, we define mega-regional unevenness as the inter-city disparities that emerge at this spatial scale.

Mega-regions are often regarded as urban-regional spatial configurations composed of multiple interrelated urban systems (Harrison & Hoyler, 2015). This reflects the complexity of mega-regional systems, based on in the morphological structures shaped by rapid urbanization and vast functional entities supporting economic interactions and flows driven by specialization and competition in the global market (Florida et al., 2008; Schafran, 2014). Both dimensions are fundamentally built upon inter-city relations carried by spatial structures and economic interactions as their carriers. This highlights that mega-regions embody a dual nature of "space" and "process" (Harrison & Hoyler, 2015): a spatial assemblage of socio-economic functions and activities based on a system of multiple urban systems (which we interpret as a spatial network grounded in inter-city relations), and a process of spatial functional restructuring and governance aimed at enhancing the overall functioning of the system (understood here as reshaping and transforming patterns of inter-city relations).

In China, the concept of the mega-region was not officially recognized by authorities as the main carrier for future urbanization until 2006. However, this does not mean that mega-regions appeared in China only after this point: scholars had already extensively discussed their emergence since the 1980s, especially in the Pearl River Delta, driven by global trade and industrial development and relocation (Yeh & Chen, 2020). As the concept becomes more widely adopted in top-level spatial policies, mega-regions are often viewed as 'spatial imaginaries' aligned with the national political goal of achieving regional coordination and integration, but not always reflected in geographical reality, either in terms of spatial arrangements or functional interaction (Harrison & Gu, 2021). Indeed, Chinese mega-regions are

assumed to possess both “space” and “process” attributes: beyond the spatial boundaries and structures explicitly defined in planning policies, the increasingly intensive inter-city relations are seen as concrete manifestations of mega-regionalization taking shape. Therefore, in this research, we focus on how inter-city relations at this scale (the space) have been progressively shaped, strengthened, and optimized (the process), with particular attention to the challenges of core-secondary imbalances within mega-regions.

The fundamental features of Chinese secondary cities

Mega-regional secondary cities are smaller urban entities outside the core in a predominantly monocentric system, which are expected to play a more significant role in building a polycentric network through processes of coordinated mega-regional governance (Su et al., 2017). However, core cities still dominate the mega-regional functional system, with knowledge-intensive and innovative industries more likely agglomerating there (Xu et al., 2022), while secondary cities play a subordinate economic role, often characterized by low-end, labor-intensive, and low profit activities (Zhang, 2015). This duality triggers core-secondary relations that are characterized by differences in functional positioning in almost all Chinese mega-regions. This is mirrored by a similarly uneven political positioning, as the role of cores as leading actors is reinforced by various regional policies (especially in some inland provinces) that aim to cultivate provincial champion cities to ensure their competitiveness in the national economic system (Zhou & Yang, 2024).

Nevertheless, this system is dynamic: regional development policies at different stages influence the cities’ political and functional positioning and further reshape core-secondary spatial relations. Since the 2000s, under state-driven regionalism, recentralized regional governance aimed at inter-city coordination has become the main approach to address problems of excessive competition and unevenness (Wu, 2016). It seeks to promote the development of secondary cities by leveraging the positive externalities of the cores. Functionally, joint industrial projects are planned and both core and secondary cities are expected to be engaged. Politically, there is a new approach of limiting the over-concentration of resources in cores and encouraging the rise of smaller cities through direct support of the cores (CNDRC, 2021, 2022). While the value of secondary cities grounded in inter-city relations is increasingly valued by Chinese authorities, the problem of mega-regional unevenness remains unresolved and entails disparities beyond demographic size and economic power. The disadvantaged position of secondary cities is visible in development gaps in social vitality, innovation capacity, industrial structure, regional embeddedness, and quality of green development, among other features of high-quality development.

1.3 A brief history of Chinese mega-regionalization and core-secondary relations

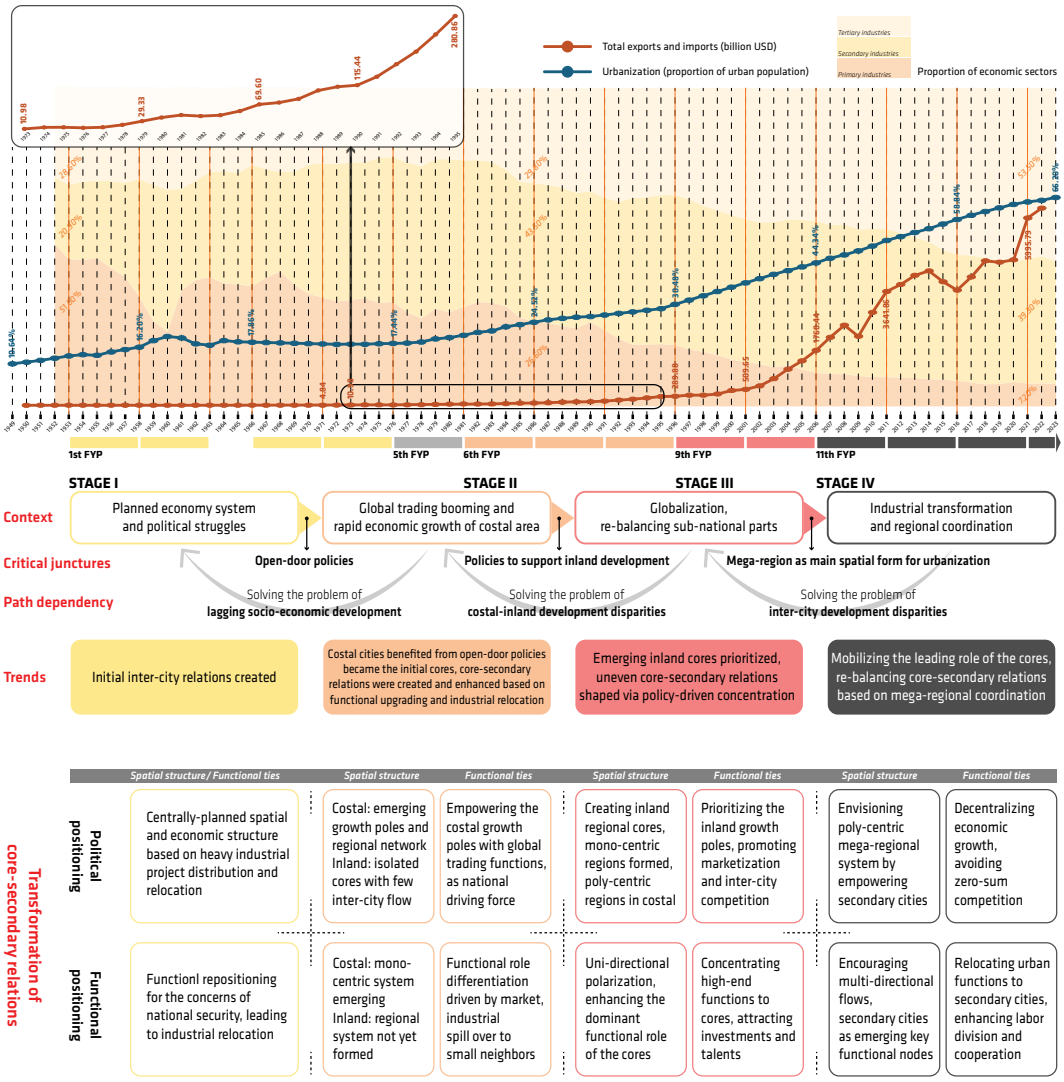

FIG. 1.1 Mega-regionalization trends and the transformation of core-secondary relations

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Drawing on the historical analysis of Chinese mega-regionalization, we divide the process of shaping and transforming core-secondary relations into four stages marked by three distinct critical junctures, which still exhibit a path dependency based on the problems left by the previous stages (Figure 1.1). We apply the conceptual understanding constructed from the two perspectives of core-secondary spatial relations, spatial structure and functional ties, and the triggers for the transformation of these relations, political and functional positioning, as the analytical tool to explore this historical process and the roles of secondary cities in each stage.

Stage I: Yet-to-be-formed core-secondary spatial relations in a planned economy

The first stage, from the 1st (1953–1957) to the 4th Five-Year Plan (1971–1975), can be characterized by two sub-stages. In the beginning, with the assistance of the Soviet Union, 472 heavy industrial projects were laid out in the inland areas, and 222 were distributed in the coastal areas. This was an attempt to balance development between sub-national parts and promote urbanization across the national territory. At this stage, the mega-region as a spatial scale had not yet taken shape, and inter-city cooperation relied on the control of the authorities, appearing in a limited scope based on industrial production chains such as raw material supply or logistic infrastructure. The second sub-stage began with the 3rd Five-Year Plan (1966–1970). Considering national security, the authorities decided to relocate heavy industries further inland, looking for substitutes for Anshan (national heavy industrial basis) and Shanghai (national industrial and commercial basis) and establishing military industries in these areas. This was known historically as the "Three Line Project", meaning that important development resources were relocated from the coastal areas (first line) to the safer inland areas (third line). However, this stage witnessed multiple turbulences and pressures from international relations, lagging production systems, and natural conditions. Coupled with the political struggles in the 1970s (McFarlane, 1983), regionalization ended with socio-economic backwardness and decline.

Although the mega-region scale had not yet materialized during this period, certain economic ties began to emerge. Cities that accommodated key national industries were, to some extent, regarded as "cores", while the surrounding inland areas were explicitly designated as "agricultural supply zones". This agricultural supply partnership can be interpreted as an early form of core-secondary relations but not situated within a mega-regional framework. In the present context, smaller neighboring cities around mega-regional cores are often tasked with similar functions: ensuring agricultural security and supplying food to the cores (DNR Hebei, 2021).

Stage II: Growing core-secondary spatial relations in emerging costal mega-regions

The second stage began with the 6th Five-Year Plan (1981–1985) (the 5th Five-Year Plan is considered a period of recovery after the political struggle). Reform and opening up towards marketization was the main theme of this stage, and the import-export trade became another critical driving force for urbanization, prioritizing eastern coastal areas as the national economic engine. While this open-door policy created an economic boom in cities such as Shenzhen that were selected by the authorities, gaining advanced functional and political positioning as pioneers of emerging global trade, it is also a period considered to be conductive to severe unevenness in China, marked by massive disparities between the eastern sub-national parts and the inland areas.

Those cities favored by the open-door policy replaced the ones with heavy-industrial distribution as the new cores politically dominating the regional system. Heavy industrial centres like Anshan gradually began to take a back seat. The 1990s witnessed the first import-export leap in the wave of globalization (Figure 1.1), allowing these coastal cities to become rich. This resulted in an asynchrony between regional development in inland and coastal areas as the inland regions continued the previous stage's development model of planned economy. Although some large cities (such as certain provincial capitals) emerged, based on machinery or other heavy manufacturing, they had not established close relations with surrounding smaller cities other than agricultural supply.

In the coastal regions, however, mega-regionalization began to take root, and core-secondary relations were gradually created and strengthened. Politically, these coastal cores were expected to become the driving force of national growth centered on manufacturing, marking the origins of the Chinese reputation as the "world's factory" (Zhang, 2006). Subsequently, in the wave of global trade, these cores encountered rising land prices and limited development space, and thus focused on more profitable sectors, which triggered industrial spillovers across the region. Surrounding smaller cities absorbed the more labor-intensive industries, also driving improvements in inter-city infrastructure. This effectively formed a mega-regional system with great centrality of the cores, and functional differentiation emerging under the market forces.

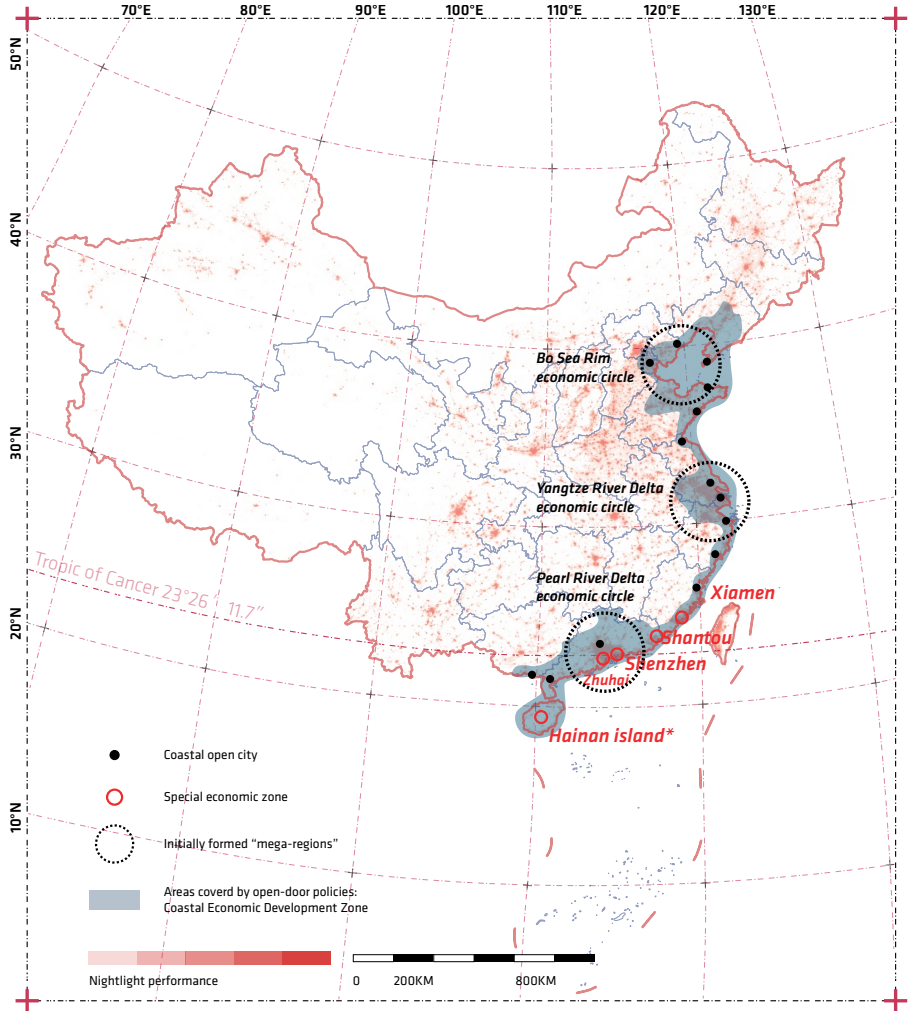

FIG. 1.2 Pioneering area in the open-door policy (Stage II)
note: Hainan was assigned as a special economic zone in 1988

In summary, the stage of open-door policy and marketization led to the rapid rise of coastal cities as national growth poles at the expense of inter-regional development disparities. As these cores upgraded their functions, industrial relocation shaped and enhanced core-secondary city relations. For the first time, the authorities officially initiated regionalism at the scale of mega-regions, even though it was limited to well-developed areas along the eastern coast, like the Yangtze River Delta Economic Zone and the Pearl River Delta.

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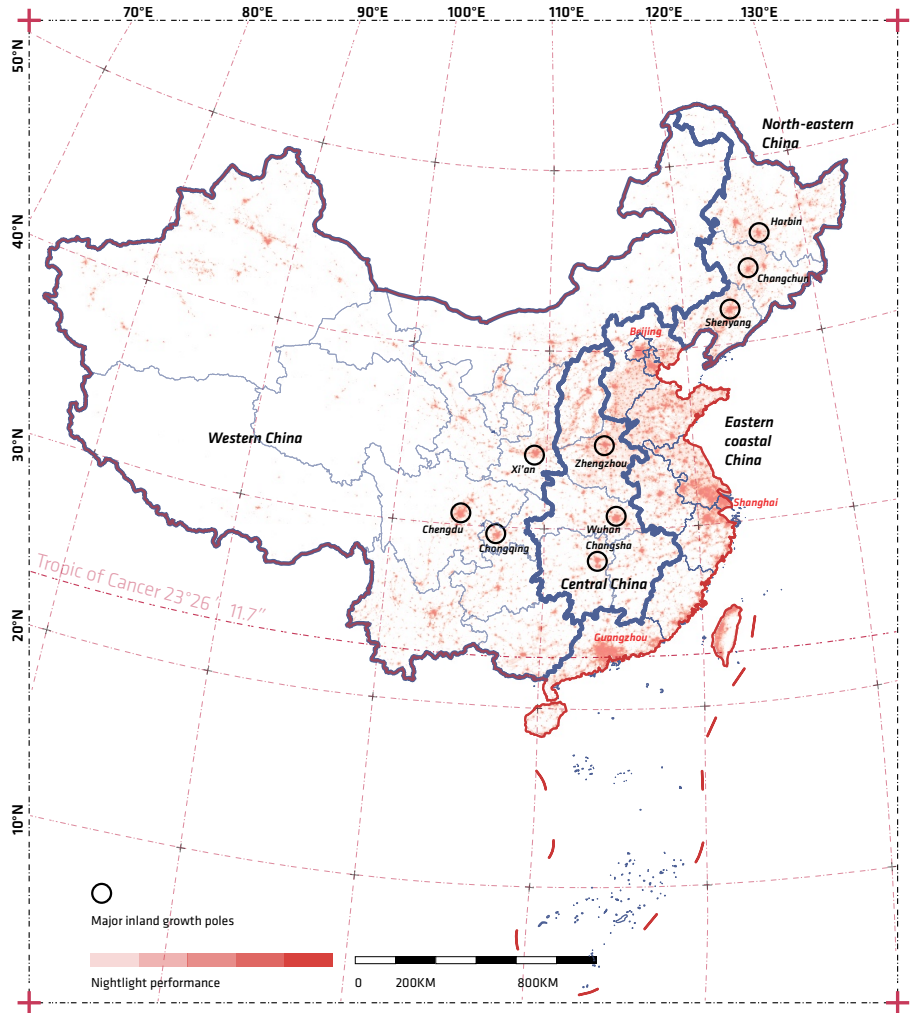

FIG. 1.3 Four sub-national parts and emerging inland growth poles (Stage III)

Resource-intensive heavy industrial cities were gradually relegated to a secondary position, as mega-regional cores transitioned toward outward-oriented economic development. Manufacturing economies that had previously concentrated in cores began to diffuse toward surrounding cities. As a result, secondary cities started to play new roles as resource-based supporters and regional manufacturing anchors, supplying raw materials or manufacturing goods to support the evolving functions of the cores.

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Stage III: The rise of new inland superstars as the basis of uneven spatial relations

The third stage consists of the 9th Five-Year Plan (1996-2000) and the 10th Five-Year Plan (2001-2005). The critical problem of the disparities among sub-national parts left from the former stage was taken seriously by the authorities, shifting from prioritizing growth of the eastern costal area to coordinated development across the entire national territory. During this decade, the role of economic engines such as the Yangtze River Delta and the Pearl River Delta was still emphasized, but they were also encouraged to support the inland areas regarding technology and finance. Based on this, in parallel to highlighting the pioneering role of the eastern parts, three regional coordination policies concerning inland areas were successively promoted (Figure 1.3): the Western China Development (since 1999), the Northeast China Industrial Revitalization (since 2003), and the Central China Rising Action (since 2004). The cultivation of emerging inland growth poles became the primary approach to rebalancing these sub-national parts. Namely, the authorities explored the potential of some inland cities through preferential policies. As a result, the inter-regional development gap has been effectively alleviated.

This process promoted the rise of large inland cities, driven by their strong industrial foundation and the policy favoritism. In this process, these cores were often positioned as manufacturing centers, seemingly replicating the development trajectory of coastal core cities in the previous stage, while an increasing number of secondary cities became transportation and logistics hubs serving the needs of the cores. In the coastal mega-regions during this stage, core-secondary relations were enhanced by industrial spillovers. Cores began to take economic functions in high-end services such as business and finance, while further relocating manufacturing and other industries to surrounding secondary cities, forming a closely connected regional network. In addition, the decentralization of economic development power promoted marketization, leading to a growth model prioritizing inter-city competition. This wave sparked a construction boom, with cities across the board engaging in large-scale building and expansion (Li et al., 2020; Tan et al., 2005). This trend was evident in both core and secondary cities, as both became drivers of the country's rapid urbanization.

In summary, coastal mega-regions were progressively consolidated in Stage III, with core-secondary relations strengthened through industrial upgrading and transfer. In the inland mega-regions, the role of emerging cores was reinforced through both preferential policies and market competition, along with severely uneven and polarized core-secondary relations.

Stage IV: Coordinating core-secondary relations by recentralized mega-regional planning

The most recent stage began with the 11th Five-Year Plan (2006-2010) and lasts till today. At this stage, the strategy of rebalancing sub-national parts remained, but more importantly, for the first time, urbanization in the form of mega-regions as the key spatial carriers was explicitly proposed by the authorities. The former strategy of creating new inland cores was upgraded to a comprehensive regionalism approach, emphasizing a more systematic regional structure responding to intra-regional unevenness. In this system, core-secondary relations were enhanced by mobilizing the leading roles of the cores in all kinds of cooperation initiatives. Mega-region became foremost a growth-oriented concept to shape a broader space for nationally and globally competitive development by reinforcing inter-city linkages. However, it is also a collaborative initiative in which zero-sum competition between cities is controlled and more attention is paid to multi-dimensional cooperation in social, economic, and cultural aspects. For example, the authorities guide some industries away from over-concentrated cores to secondary cities, giving these smaller players more important functional positioning. In this way, they outline a more integrated and coordinated spatial planning vision to reshape inter-city relations that includes environmental, social, and institutional systems.

Spatial planning for mega-regions thus became a governance tool developing spatial structures and axes, functional spatial layouts, and statutory spatial regulations. This is also known as the "planning imaginary", in which mega-regions are not real geographical entities but future visions (Harrison & Gu, 2021). The plans envision a transformation toward polycentric mega-regional systems, reflecting the growing emphasis on the economic potential of secondary cities. They are expected to develop distinctive economic sectors and achieve functional complementarity with the cores, rather than only receiving the phased-out sectors. Core-secondary integration is emphasized at spatial and economic levels, through strengthened infrastructure connections and guided development corridors, as well as joint economic clusters.

This stage marked the envisioning of a model of core-secondary coordination by formally designating the mega-region as a strategic spatial platform for future urban development. Economic ties between core and secondary cities were further reinforced. Building on previous roles, secondary cities were now expected to serve as new frontiers for industrial upgrading, fostering the development and attraction of high-tech industries and emerging financial and business services. The scope of their functional roles expanded beyond manufacturing, with leisure and recreational service provision for the core also encouraged, aimed at unlocking the potential for greater economic diversification within secondary cities themselves.

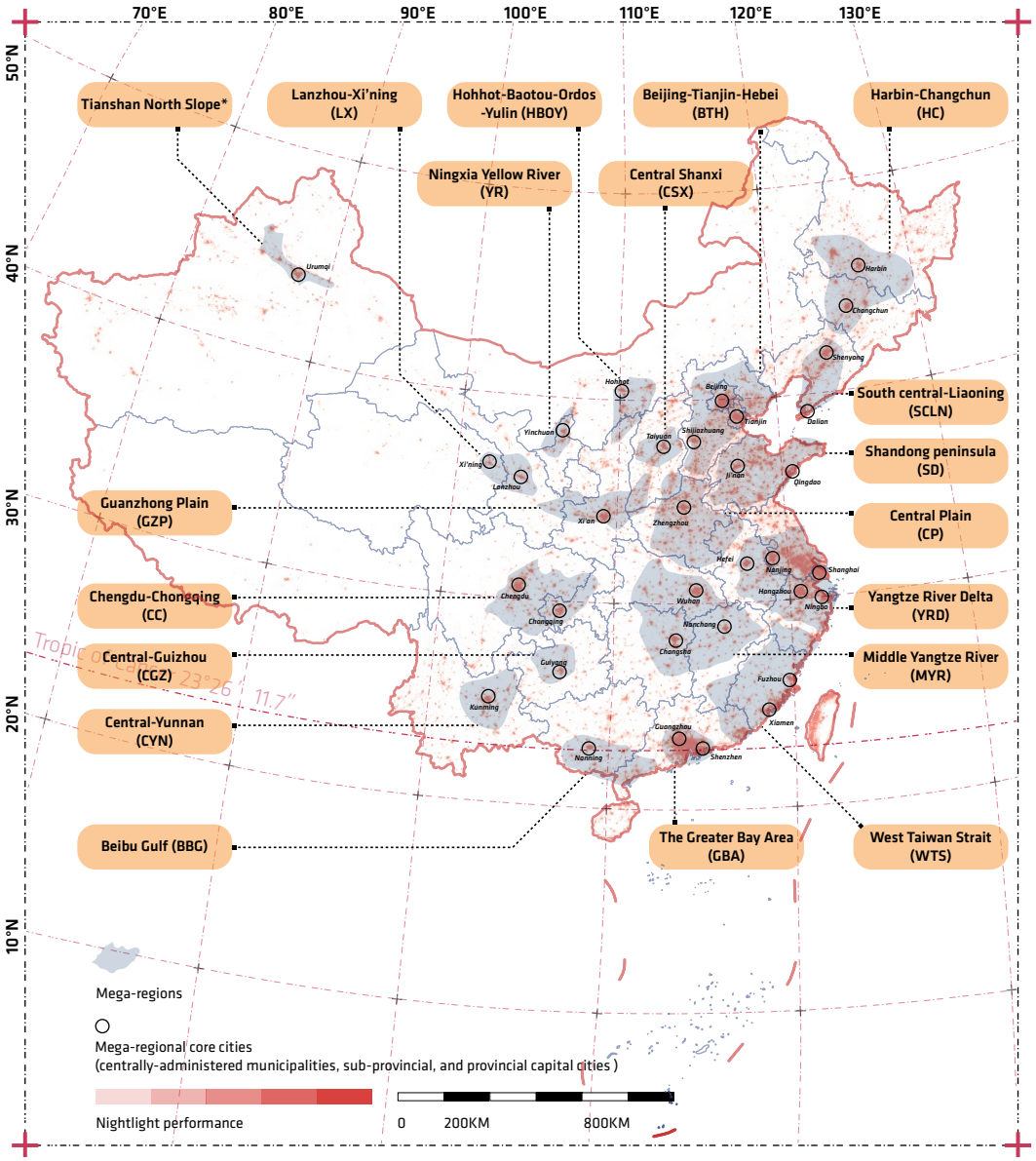

FIG. 1.4 Chinese mega-regional system (Stage IV)

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1.4 The unsolved problems of unevenness in Chinese mega-regionalization

1.4.1 Delimiting mega-regional secondary cities and measuring intra-regional unevenness

The historical analysis of mega-regionalization in China reveals two key insights. First, contemporary mega-regionalization is a top-down, recentralized spatial governance process initiated by central authorities (Wu, 2016). Through spatial planning, 19 regional units have been created across the national territory in the Fourteenth Five-Year Plan (CNDRC, 2021). Within these units, core cities are typically centrally administered municipalities, provincial capitals, and sub-provincial cities. These cities hold higher administrative levels, meaning greater political voice (Zhang et al., 2021; Du et al., 2024b). As regional cores, they also benefit from preferential policies and multidimensional support and are positioned as economic growth engines for the respective mega-regions, as exemplified by the widely implemented "strengthen provincial capital" strategy (Zhou & Yang, 2024). Accordingly, in this study, we categorize these cities as mega-regional cores, while **all remaining prefecture-level cities within each mega-region are classified as secondary cities for the subsequent analysis**.

Second, tackling intra-regional unevenness is a comparatively recent policy concern. While the open-door policy during Stage II triggered severe inter-regional disparities, Stage III sought to address this by cultivating inland growth poles. It was not until Stage IV, when mega-regionalization was formally implemented at the national scale, that the unevenness between cores and secondary cities became a direct focus of policy intervention. Building on this, this section aims to examine whether this mega-regional gap has been effectively mitigated since the onset of Stage IV.

Our conceptualization of secondary cities stems from their political and functional positioning within regional systems, characterized by multiple uneven relations with the cores both at spatial and economic levels. Political positioning in mega-regions is framed by the authorities' role in urban development by intervening, for instance in local government fiscal capacity, infrastructure, and space for further development. This is relevant because political preferences have increasingly become a driver of

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a selective concentration of development resources and decision-making power. Functional positioning refers to a city's preferred combination of functional sectors aiming at economic vitality, social attractiveness, regional embeddedness, and innovation and knowledge concentration.

Based on this understanding, we developed an evaluation system with ten specific indicators to explore the unevenness between core and secondary cities during Stage IV by comparing data from 2006 and 2023. Core and secondary cities within each mega-region are grouped separately, and our analysis focused on the disparities between these two groups. The **Theil index** and **Dagum Gini coefficient** are employed as mature and reliable methods for calculating inter-group development gaps (Dagum, 1997; Theil, 1973). We use these techniques for measurement, and the results obtained from both approaches corroborate each other, demonstrating the robustness of the findings.

TABLE 1.1 The indicator system

	Measuring perspective	Indicator proxy	Data source
Political positioning	Population concentration	Population	Yearbook data (CNBS, 2007b, 2024b)
	Economic strength	GDP	Yearbook data (CNBS, 2007b, 2024b)
	Potential for growing polycentric system	Built-up area	National Land Survey (CMNRC, 2009, 2023)
	Attractiveness for urban construction	Infrastructure and fixed asset investment	Yearbook data (CNBS, 2007b, 2024b)
	Local capacity for economic progress	Governmental expenditures	Yearbook data (CNBS, 2007b, 2024b)
Functional positioning	Spatial pattern of social vitality	Nighttime light index	Harvard Dataverse (Wu et al., 2021)
	Regional embeddedness	Region transportation land area (railways and airport)	National Land Survey (CMNRC, 2009, 2023)
	Advanced industrial clustering	Tertiary sector income	Yearbook data (CNBS, 2007b, 2024b)
	Innovation capacity	Patent per capita	Collected from CNKI, www.cnki.net
	Innovation cultivation	Higher education teachers per capita	Yearbook data (CNBS, 2007b, 2024b)

Notably, unlike previous stages, the mega-region in Stage IV remains a spatial imaginary rather than a fully realized geographic entity, reflecting the top authorities' ambitions for territorial governance (Harrison & Gu, 2021). The 14th Five-Year Plan clearly outlines three distinct developmental phases for all mega-regions:

- **Optimizing:** those that have already formed close and developed regional systems, often including the largest cities, including Beijing-Tianjin-Hebei (BTH), Yangtze River Delta (YRD), Guangdong-Hong Kong-Macao Greater Bay Area (GBA), Chengdu-Chongqing (CC), and Middle Yangtze River (MYR);

- **Expanding:** those with an initial development foundation but where highly integrated and coordinated inter-city relations have yet to be established, including Shandong Peninsula (SD), Western Taiwan Strait (WTS), Central Plain (CP), Guanzhong Plain (GZP), and Beibu Gulf (BBG);

- **Cultivating:** mega-regions that largely remain at the level of planning imagination, with low levels of both development and coordination. In this chapter, we excluded mega-regions with very low development levels or too few cities, focusing mainly on Harbin-Changchun (HC), South-central Liaoning (SCLN), and Central Shanxi (CSX).

1.4.2 First impression: significant disparities remain between core and secondary cities

We first compared the changes of inter-city disparities between core and secondary cities from 2006 to 2023. The results show that the gaps between core and secondary cities are still pronounced across nearly all dimensions (Figure 1.5 & 1.6). For example, regarding population, in 2006, the cores in some mega-regions did not particularly stand out; however, by 2023, they demonstrated significantly stronger population agglomeration capacity, especially in some inland mono-centric mega-regions. Moreover, the population centrality of some "second cores" has also risen significantly, for instance, Nanjing and Hangzhou in the Yangtze River Delta and Shenzhen in the Greater Bay Area. The rapid population growth in core cities marked the success of the national growth pole strategy in Stage III, contributing to a narrowing of disparities between regions while making the intra-regional unevenness between core and secondary cities more pronounced. For secondary cities, we find that in GDP, higher education students, and regional transportation indicators they remain in a disadvantaged position as cores have maintained their central roles in economic agglomeration, talent cultivation, and transport hubs. In other dimensions, however, some secondary cities have made notable progress, particularly in attracting governmental expenditures. This suggests an improvement in the political positioning of secondary cities.

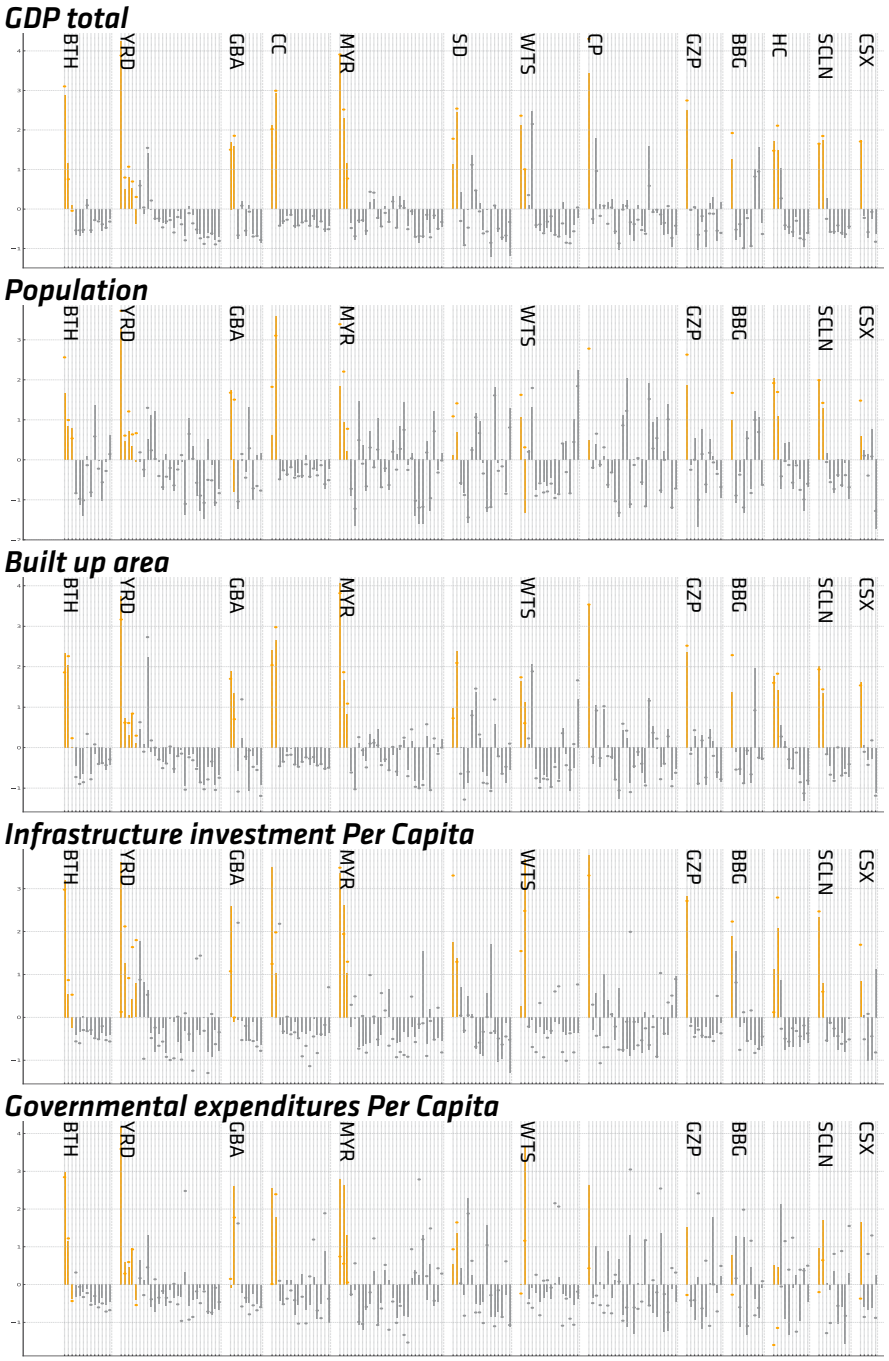

FIG. 1.5 Comparison of core-secondary political positioning

note: Yellow represents cores, grey represents secondary cities columns represent 2006, dots represent 2023

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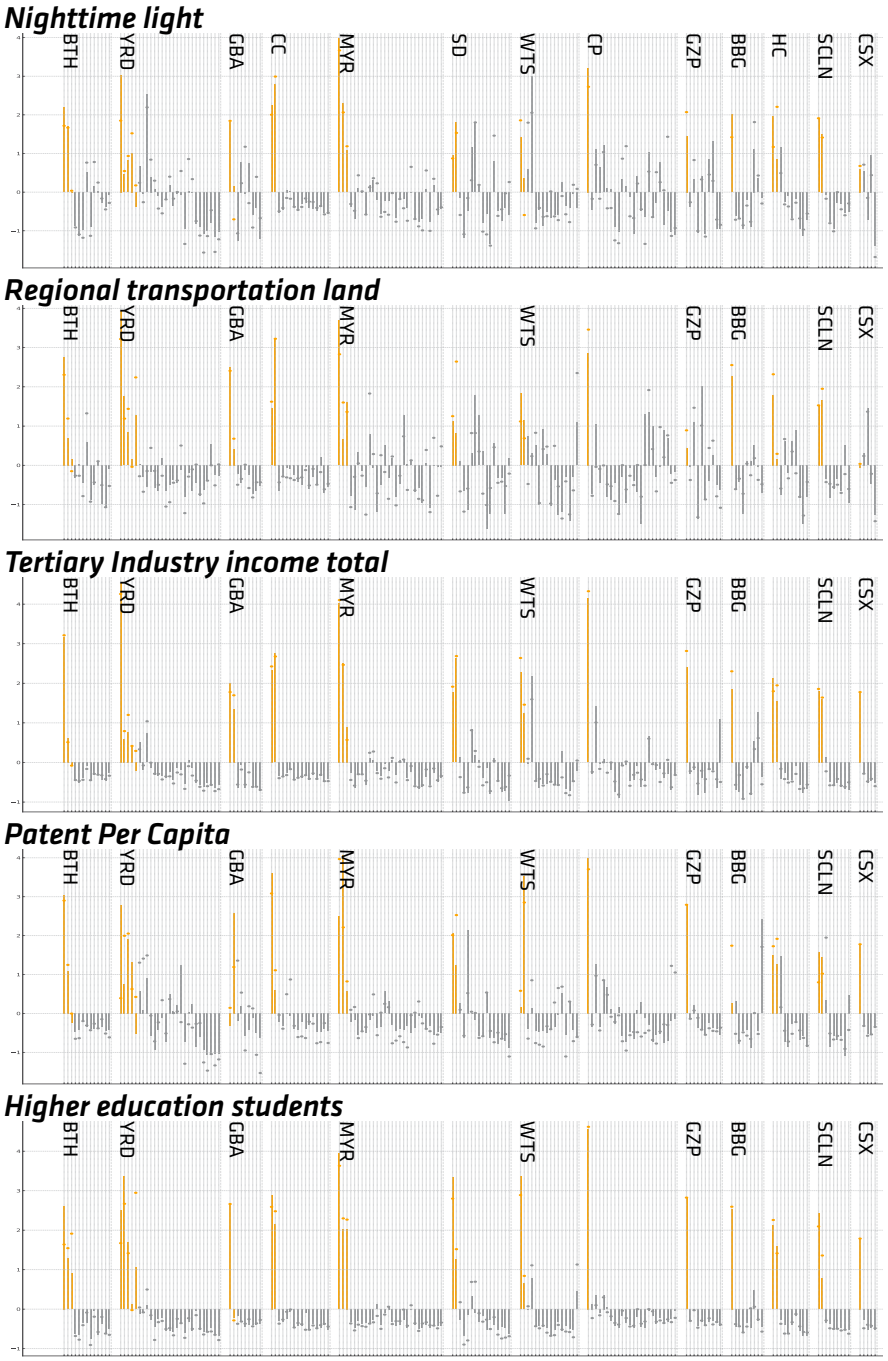

FIG. 1.6 Comparison of core-secondary functional positioning

note: Yellow represents cores, grey represents secondary cities columns represent 2006, dots represent 2023

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1.4.3 Changes in core-secondary unevenness

For further exploration, we calculated the core-secondary unevenness between the two groups using two approaches: the Theil index and the Dagum Gini coefficient (Figure 1.7 & 1.8). The results from these different methods were closely aligned. The core-secondary unevenness in 2023 shows variations across mega-regions. For instance, Beijing-Tianjin-Hebei, Chengdu-Chongqing, Guanzhong Plain, Harbin-Changchun, and Central Shanxi exhibit higher levels of unevenness across most dimensions, indicating that cores continue to dominate in both political and functional positioning.

For specific indicators, especially regarding economic agglomeration, the gap is striking (for example the Theil index reaches 0.68 in Chengdu-Chongqing). Unevenness is even more evident in infrastructure investment per capita, where Guanzhong Plain records 0.73. This is not surprising, since despite a relatively balanced governmental capacity, secondary cities still face a significant gap in their ability to attract socio-economic activities and urban expansion investment compared to cores. For functional indicators, core-secondary unevenness is particularly strong in higher education students and tertiary industry income. In Central Shanxi, higher education is concentrated in the provincial capital Taiyuan, with a Theil index of 1.3; in Chengdu-Chongqing, the two cores dominate most high-end industries, reflected by a Theil index of 0.83 of tertiary industry income. As cores continue to hold these advantages over smaller players, they further consolidate their dominant position in the regional functional system.

Based on this understanding of the current state of core-secondary unevenness, we further measured its changes from 2006 to 2023 (Figure 1.9 & 1.10). From the perspective of urban size, both economic agglomeration and total population show a notable widening of the gap between core and secondary cities, with only Yangtze River Delta and Central Shanxi showing a slight decrease in GDP unevenness. Governmental expenditures have declined to some extent, particularly in more developed mega-regions such as Beijing-Tianjin-Hebei and Greater Bay Area. These two mega-regions also show the most significant decrease in built-up area unevenness, largely due to strict control over urban expansion in their cores. In contrast, other mega-regions, such as Guanzhong Plain and Beibu Gulf, exhibit continued expansion of the built-up area in the cores, reflecting the mega-regional ambitions to further strengthen them. Functionally, tertiary sector development has become increasingly polarized across almost all mega-regions, with only a slight reduction observed in Yangtze River Delta. More developed mega-regions show a decline in unevenness across other dimensions, particularly in nighttime light and patents, suggesting improvements in social vitality and innovative capacity. In less developed mega-regions, however, such improvements are not evident.

Mega-region	GDP Per Capita	GDP total	Population	Built up area	Infrastructure investment Per Capita	Governmental expenditures Per Capita	Nighttime light	Higher education students	Patent Per Capita	Tertiary Industry income total	Regional transportation land
CSX	0.01822	0.15495	0.05222	0.08607	0.21376	0.00051	0.00769	1.28859	0.37530	0.31183	0.00004
SCLN	0.02266	0.45005	0.25324	0.22111	0.58617	0.00018	0.12752	0.70633	0.06023	0.50604	0.29094
HC	0.00861	0.31038	0.19374	0.14500	0.57721	0.00373	0.15389	0.81365	0.26289	0.43337	0.07374
BBG	0.00015	0.06476	0.05586	0.07532	0.27167	0.00032	0.04770	0.63389	0.05984	0.14847	0.19528
GZP	0.01705	0.39094	0.17942	0.18275	0.72960	0.00016	0.08478	0.90080	0.51281	0.60584	0.01473
CP	0.00909	0.13635	0.03399	0.05971	0.11305	0.00036	0.02377	0.68370	0.09131	0.18181	0.06080
WTS	0.02291	0.09984	0.01619	0.02104	0.19784	0.00300	0.00776	0.25014	0.06370	0.17131	0.01897
SD	0.01933	0.11737	0.01996	0.02132	0.38300	0.00706	0.01492	0.19489	0.11438	0.18532	0.06686
MYR	0.01373	0.23068	0.07952	0.09822	0.21427	0.00048	0.11298	0.69378	0.12653	0.30968	0.05951
CC	0.01196	0.67646	0.45161	0.58452	0.05848	0.00246	0.50982	0.97701	0.16408	0.82707	0.56412
GBA	0.02671	0.31264	0.14350	0.03651	0.03475	0.03256	0.00725	0.59907	0.01448	0.49482	0.26783
YRD	0.00581	0.16209	0.09833	0.07049	0.07455	0.01134	0.02866	0.35907	0.02605	0.26421	0.12724
BTH	0.07176	0.39835	0.09404	0.16404	0.56231	0.05321	0.05075	0.33291	0.25496	0.57791	0.04785

FIG. 1.7 Core-secondary unevenness in 2023 Theil index

Mega-region	BTH	YRD	GBA	CC	MYR		SD	WTS	CP	GZP	BBG		HC	SCLN	CSX
GDP Per Capita	0.03460	0.02065	0.08171	0.05397	0.03951		0.03552	0.07606	0.02774	0.05963	0.00000		0.00000	0.05603	0.07971
GDP total	0.35877	0.10846	0.36719	0.49522	0.25766		0.18474	0.04933	0.13882	0.34241	0.12779		0.35805	0.44448	0.24671
Population	0.18630	0.12964	0.24309	0.39429	0.14135		0.04577	0.03474	0.06144	0.21848	0.11783		0.27810	0.32849	0.13830
Built up area	0.23719	0.01645	0.06825	0.45617	0.15899		0.04865	0.02614	0.08499	0.22079	0.13890		0.23809	0.30571	0.18022
Infrastructure investment Per Capita	0.50118	0.06609	0.00000	0.07396	0.24703		0.35915	0.24731	0.12400	0.49185	0.28597		0.49754	0.50937	0.29317
Governmental expenditures Per Capita	0.11199	0.03042	0.00000	0.00983	0.00233		0.02596	0.00817	0.00000	0.00000	0.00000		0.00000	0.00407	-0.01266
Nighttime light	0.07729	0.04911	0.02861	0.42228	0.17194		0.03041	0.01939	0.05020	0.14301	0.07526		0.24580	0.22834	0.04910
Higher education students	0.38217	0.29156	0.50525	0.60711	0.48541		0.24523	0.22590	0.37994	0.55519	0.46485		0.59341	0.55967	0.73740
Patent Per Capita	0.33219	0.02656	0.04831	0.22267	0.18325		0.18212	0.11718	0.10914	0.40090	0.12237		0.32757	0.03766	0.39630
Tertiary Industry income total	0.50819	0.20450	0.46690	0.55396	0.30507		0.23840	0.20495	0.16542	0.44166	0.20290		0.42782	0.47234	0.35895
Regional transportation land	0.06894	0.17494	0.33838	0.44712	0.08869		0.13549	0.00962	0.08589	0.03797	0.23692		0.13623	0.35351	0.00356

FIG. 1.8 Core-secondary unevenness in 2023 Dagum Gini Coefficient

Mega-region	GDP Per Capita	GDP total	Population	Built up area	Infrastructure investment Per Capita	Governmental expenditures Per Capita	Nighttime light	Higher education students	Patent Per Capita	Tertiary Industry income total	Regional transportation land
CSX	-0.07883	-0.02816	0.04776	-0.01626	0.15260	-0.01811	0.00088	0.41008	-0.29413	0.01182	-0.00008
SCLN	-0.00129	0.16453	0.13041	-0.02784	0.24758	-0.02432	-0.01448	-0.26361	-0.07813	0.08326	0.10935
HC	0.00197	0.12566	0.10994	-0.05193	0.21791	0.00080	0.04910	-0.11709	0.10646	0.07986	0.03973
BBG	-0.00015	0.02669	0.03658	-0.04617	0.01051	-0.00287	-0.03075	-0.06700	0.05544	0.04698	0.09788
GZP	-0.01706	0.23552	0.14403	-0.04888	-0.26905	-0.01188	0.03136	-0.27747	-0.15892	0.38237	0.01103
CP	-0.01975	0.07055	0.03280	-0.00668	-0.04087	-0.02081	-0.02436	-0.06072	-0.10511	0.03930	0.07137
WTS	-0.06346	0.02906	0.01588	-0.01927	-0.71708	-0.24136	-0.01358	-0.11635	-0.33371	0.07580	-0.07253
SD	0.01159	0.06594	0.01780	-0.01741	0.31024	-0.01087	-0.00354	-0.21621	-0.01913	0.04311	0.05336
MYR	-0.04102	0.03276	0.06818	-0.01538	-0.18287	-0.03797	-0.05757	-0.19743	-0.38438	0.00538	-0.03535
CC	-0.02262	0.12855	0.20097	-0.00864	-0.84430	-0.03732	-0.07974	-0.00529	-0.49910	0.07300	0.09656
GBA	-0.03861	0.05478	0.13223	-0.05300	-0.24421	-0.38918	-0.01698	-0.12028	-0.32212	0.11963	-0.16009
YRD	-0.01528	-0.00766	0.06745	-0.01913	-0.07114	-0.09316	-0.02976	-0.17313	-0.09289	-0.00669	-0.11335
BTH	-0.00707	-0.09715	0.06381	-0.08203	0.06323	-0.19853	-0.04200	-0.15024	-0.48796	0.05865	-0.07828

FIG. 1.9 Changes in core-secondary unevenness from 2006 to 2023 Theil index

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FIG. 1.10 Changes in core-secondary unevenness from 2006 to 2023 Dagum Gini Coefficient

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In summary, mega-regionalization has occasionally mitigated some unevenness factors, but the effectiveness is limited. Secondary cities have gained more development space and improved institutional capacity, alongside progress in social vitality, talent cultivation, and innovation. However, many cities continue to face challenges, particularly regarding urban growth and the attraction of advanced industries. While mega-regionalization has generated some positive outcomes in addressing unevenness, the consolidation of the dominant position of the cores remains a fundamental barrier that secondary cities must overcome.

1.4.4 Problem statement: polarization and peripheralization of secondary cities in Chinese mega-regionalization

Secondary cities currently face two main challenges. First, the unevenness factors stemming from their political positioning in the mega-region have clearly intensified and the centrality of cores continues to strengthen. We observe the rise of some "second cores", such as provincial capitals beyond Shanghai in the Yangtze River Delta, which seems to be partially aligning with the authorities' vision of a polycentric regional system. However, most secondary cities have not benefited from this trend. From an economic perspective, there has been some alleviation of unevenness in infrastructure investment and government expenditure, signaling a gradual shift toward decentralization, but disparities are still significant. This resembles an "accelerator" effect, promoting cores further ahead and leaving their smaller neighbors behind. Under such conditions, secondary cities face the risk of becoming increasingly **peripheralized** spatially, economically, and politically.

Similarly, the unevenness across the functional positioning indicators remains significant. In all mega-regions, the unevenness in the tertiary sector continues to worsen. Moreover, although some secondary cities have made progress in innovation capacity, the large absolute gap exposes them to the challenge of functional **polarization**: cores dominate high-end economic sectors while holding superior innovation capacity, leading to further concentration of consumer markets, talent, industries, and investment. In parallel, secondary cities face the outflow of development resources and fail to benefit from positive network externalities.

1.5 Research aim

Reconceptualizing Chinese mega-regionalization

The discussion above helps frame two core arguments of this research. First, secondary cities are conceptualized relationally, as cities that, within a given regional system, are smaller in scale and weaker in terms of both functional and political positioning, but are (or are expected to be) closely linked to core cities. Due to uneven regional development, these cities face increasing challenges of polarization and peripheralization, which frame the main problem of this study. Second, in response to the deepening unevenness, the national authorities have turned to mega-regionalization as a strategy to foster beneficial interactions between core and secondary cities, rebalance regional development and construct more competitive economic systems (Li & Wu, 2012; Wu, 2016). This process has been carried forward through top-down, vision-driven initiatives rooted in spatial planning, with the aim of achieving coordinated mega-regions.

Accordingly, core-secondary spatial relations, defined as the multidimensional connections and interactions governed through spatial planning, are framed as the main research lens to explore how secondary cities navigate the challenges of unevenness within the process of mega-regionalization. From this perspective, mega-regionalization is further conceptualized as **a recentralized regional governance process to coordinate core-secondary spatial relations through initiating and implementing spatial planning visions**. This process has three main features:

— **It is directed toward the long-term goal of regional coordination**, rather than a fully realized geographical space or a spatial area delineated on a map. Mega-regionalization entails vision-led spatial planning and implementation efforts aimed at gradually constructing intra-regional morphological (e.g., new town development), network-based (e.g., infrastructure extension), and functional (e.g., co-development of industrial clusters) connections and interactions. The vision of coordination can thus be interpreted through three main dimensions: morphological polycentricity, spatial flow multi-directionality, and functional complementarity.

— **It represents a top-down mode of recentralized governance** in which spatial planning functions as a key instrument. Wu (2016) interprets the rise of Chinese mega-regions as an attempt by the state to reassert control over regional governance by coordinating inter-city competition and reducing redundant production. Since the 1990s, the central government had decentralized economic development power to local levels and encouraged market-driven competition, aiming to stimulate growth and strengthen China's position in the global economy. While this led to unprecedented economic expansion, it also exacerbated disparities among cities. In this context, mega-regionalization is promoted as a strategy to tackle unhealthy inter-city relations.

— **The top-down governance involves at least two interconnected levels**, namely the strategic planning visions from national authorities, and the operational implementation and actions at prefecture-level cities and intra-city urban entities. Both are crucial to shape the effectiveness of regional coordination. While visions tend to be long-term, abstract, and ideological, they are translated at the local scale into more concrete and actionable spatial interventions through which mega-regionalization is expected to take effect.

Research framework

The main research question we aim to answer in this PhD project is:

— **To what extent can the coordination of core-secondary spatial relations help secondary cities to navigate mega-regionalization in the face of polarization and peripheralization challenges?**

Exploring this question enables us to investigate Chinese mega-regionalization from the perspective of secondary cities, understood as a top-down spatial governance process, We begin by examining the current state of unevenness in Chinese mega-regions and differentiating the characteristics of secondary cities, informing the selection of case studies in later chapters. We structure our research across multiple scales, from the national to the mega-regional level, and finally to the local scale of cities. In this way, we deconstruct the main question into four steps (see Figure 1.11). For detailed methodological approaches, please refer to the corresponding chapters.

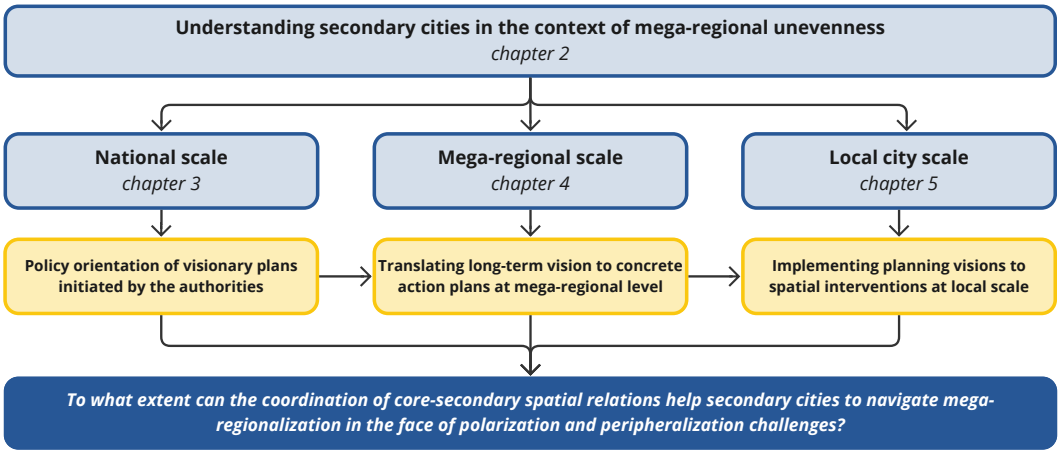

FIG. 1.11 Overall research framework

Sub- question 1: understanding secondary cities:

— **In what ways do the challenges of intra-regional unevenness unfold across mega-regions and secondary cities with different characteristics in China?**

It must be acknowledged that our current definition of secondary cities remains simplified. In terms of population size alone, Chinese prefecture-level cities range from over ten million to less than one million residents, reflecting vast disparities (Table 1.2), alongside differences in economic structures, social development, and environmental conditions. Thus, it is clearly inappropriate to treat them as a homogeneous category. A more nuanced understanding of the characteristics of different secondary cities is therefore essential.

This is the focus of Chapter 2. We adopt a typological approach aimed at categorizing various types of secondary cities, enabling us to examine their specific characteristics and inter-type differences. This contributes not only to a more comprehensive portrait of secondary cities in China but also lays a foundation for the in-depth case studies that follow. In terms of classification criteria, this research is fundamentally concerned with the unevenness between core and secondary cities in mega-regions. Therefore, we identify the multi-dimensional development gaps between each secondary city and its corresponding core city as a basic differentiation attribute. This approach allows us to investigate the distinct challenges that different types of secondary cities face in relation to mega-regional unevenness.

TABLE 1.2 Population of selected secondary cities (prefecture-level city scale) and their approximate ranking nationwide

Rank	City	Total Population of the prefectural city (million)	Prefectural core population (million)
~10	Linyi	11.02	2.47
~20	Handan	9.41	3.67
~50	Yantai	7.01	2.52
~100	Jiujiang	4.60	1.16
~150	Jiaozuo	3.52	1.09
~200	Baotou	2.72	2.05
~300	Tongchuan	0.70	0.58

Note: There are 333 prefecture-level administrative divisions in the country (NBS, 2019)

Sub-question 2: examining policy orientations at national level:

— **What are the policy orientations of mega-regional coordination for secondary cities initiated by national authorities and what governance mismatches, at the theoretical level, prevent their materialization?**

Building on our typological understanding of secondary cities in the Chinese mega-regional system, we turn our attention to how they are positioned within such systems by **top-level policy orientations**. The national strategy to foster coordinated core-secondary spatial relations through recentralized planning, raises a key conceptual question: how should "coordination" be understood? More specifically, to what extent do the policy orientations from this top-down vision of regional development result in beneficial core-secondary spatial relations, namely, in terms of morphological polycentricity, multi-directionality of spatial flows, and functional complementarity?

The dual challenges of polarization and peripheralization currently faced by secondary cities suggest that the intended benefits of state-led mega-regional coordination policies have not been effectively realized. This suggests the presence of governance mismatches between the top-down vision (as reflected in policy orientations) and implementation at the local level, which may create new challenges for secondary cities in the process of mega-regionalization.

To gain a broader perspective, this step does not focus on a specific mega-region but analyzes all of them. We employ **policy analysis** of the official mega-regional development plans issued by the state as primary materials. Through **thematic analysis**, we examine their respective policy orientations in terms of goals, main approaches to governing spatial relations, and resulting mismatches when seen from

the perspective of secondary cities. This analysis forms the **conceptual framework** for the subsequent chapters, offering analytical tools to support more in-depth investigation for specific case studies.

Sub-question 3: planning at mega-regional level

— **To what extent do misalignments in mega-regional scale planning trajectories constrain the pursuit of core-secondary coordination?**

The visionary plans issued by national authorities are often broad and ambiguous, providing only general directions for future coordination rather than concrete projects or interventions. As a result, visions are typically translated at the mega-regional level into more specific and short-term **action plans** aimed at addressing urgent challenges and achieving specific development goals. In the absence of an official mega-regional authority to make decisions and manage implementation, **provincial governments** often assume the role of **coordinators**, coordinating the allocation of resources and implementation agreements between core and secondary cities to fulfill the top-level policy orientations. In cross-provincial mega-regions, inter-provincial negotiation is often required, though in practice provinces may still act unilaterally based on their internal spatial agendas.

Overall, this step of the research focuses on the **intermediate stage** between the top-level visionary planning and the implementation at the city scale. It reflects on the extent to which secondary cities are genuinely considered and (re)positioned into meaningful and beneficial roles within the mega-regional system when the visions are translated into concrete action plans and linked with resources. This is critical given the original intention to grant more strategic importance to secondary. If the mega-regional coordinators divert this vision towards alternative priorities and fail to meaningfully position secondary cities, the envisioned coordination benefits will remain unfulfilled.

To examine this issue in depth, we build on the typology of secondary cities developed previously and select representative mega-regional cases for further investigation. Provincial governments are treated as key coordination actors of this intermediate stage. We analyze yearly provincial governmental reports from 2006 to 2025, identifying specific action plans that focus on core-secondary spatial relations. Based on the broader planning guidelines, these reports tend to list the coordinators' specific actions in a given year and the preferred responses to secondary city challenges, operationalizing the visions and guiding practical interventions on the ground. Using a historical institutionalist lens, we trace the

evolving positioning of secondary cities as the efforts to reshape core-secondary spatial coordination take shape. This exploration aims to understand how the intermediate stage affects the ability of secondary cities to integrate into mega-regions and co-construct spatial relations with core cities, helping explain why unevenness challenges remain difficult to overcome for these smaller players.

Sub-question 4: planning implementation at city level

— **Through what pathways do secondary cities spatialize the mega-regional vision and what practical obstacles do they face in that process?**

After examining mega-regionalization at the national level, focusing on top-down policy orientations, and at the mega-regional level where coordinators (re)position secondary cities through action plans, this final stage of the project turns to the lowest tier of this governance process: the local scale of secondary cities. While the previous questions addressed different layers of planning, they still revolve around a vision-oriented spatial imagination for mega-regional coordination. At this stage, we adopt **state entrepreneurialism** as the analytical framework to understand how secondary cities, as local state actors, respond to and operationalize state-led mega-regional visions. This framework highlights the use of entrepreneurial instruments, through which local governments seek to align themselves with broader developmental agendas, while also revealing their structurally constrained and often passive roles within inter-city relations.

It is only at the local scale that such planning is translated into concrete spatial interventions and projects, which activate mega-regionalization on the ground. We conceptualize this process as **spatialization**. Accordingly, we explore how secondary cities attempt to spatialize top-level visions and action plans, and what practical obstacles they face that undermine the effectiveness of spatialization, preventing them from integrating into the mega-regional system.

Methodologically, this stage places secondary cities at the center of inquiry. Drawing once again from the typology, we select a representative case, the city of Handan, that exhibits multiple challenges and shares key characteristics with other types of secondary cities. The study is grounded in fieldwork. We first examine Handan's governmental yearly reports to identify the concrete spatialization pathways pursued in line with mega-regional coordination goals. This is followed by field observations to assess the implementation of these pathways. Finally, in-depth interviews with senior local officials and expert scholars are conducted to gain insights into the practical obstacles encountered in the spatialization process. Through this, we

both empirically validate the conceptual framework developed in sub-question 2, particularly the governance mismatches and how they manifest at the local scale, and gain grounded insights into the positioning of secondary cities within core-secondary spatial relations. This provides a solid empirical foundation for policy refinement and advancing more effective mega-regional coordination.

1.6 Research highlights and significance

Shifting the Analytical perspective

Over the past decades, as mega-regionalization gained increasing attention, the role of core cities in leading regional integration into the global market and enhancing competitiveness has been emphasized (Hall & Pain, 2006; Pain, 2011). Smaller regional centers, struggling under the shadow of these superstar cores, have received limited academic and policy attention. This research shifts the analytical perspective of mega-regional studies from a core-dominated perspective to one centered on secondary cities. By positioning them as the primary subjects of exploration, we critically reflect on the process of mega-regionalization and its role in tackling or exacerbating intra-regional unevenness. This shift in perspective not only opens an alternative pathway to address unevenness problems but also highlights the potential of secondary cities to contribute to a more coordinated and balanced mega-regional system.

Although this research is strongly anchored in the Chinese context, the perspective from secondary cities provides a comparative window with global relevance. We conceptualize the challenges faced by secondary cities as polarization and peripheralization, conditions that reflect the trajectories of many smaller urban centers adjacent to global cities or mega-cities worldwide. Despite their widely acknowledged value in contributing to diversified innovation, industrial complementarity, and social livability, their political voice and economic potential are often eclipsed by the prominence of nearby cores. By taking China as a case to explore such regionalization challenges, we anticipate that the insights generated can be meaningfully transferred to broader international contexts through comparative reflection across other regional systems with similar uneven conditions.

Conceptual Contribution

The key to our secondary city-based framework is the lens of **core-secondary spatial relations**. On one hand, uneven spatial relations, characterized by disparities in economic, political and functional roles, have redirected development resources from secondary to core cities, leading to over-concentration in the latter and shrinkage in the former. This dynamic is widely recognized as a key driver of intra-regional unevenness. On the other hand, transforming those relations offers opportunities to alleviate pressures on core cities through decentralization and foster spatial integration and resource sharing that benefits secondary cities.

This research contributes to three central themes in regional studies related to inter-city relations, namely **network externalities, inter-city competition and cooperation, and multi-level governance**. While these perspectives have been instrumental in explaining how spatial relations are shaped, strengthened, and optimized, they tend to frame the discussion from the vantage point of the regional system as a whole or the dominant cores, rather than placing secondary cities at the center of analysis. In the network externalities literature, secondary cities are often assumed to passively benefit from spillovers once the core becomes "strong enough", with little consideration of the temporal costs, institutional boundaries, or path dependencies that may constrain such benefits. Studies on inter-city competition and cooperation frequently emphasize the leaderships of cores and the market-driven dynamics of regional competitiveness, leaving the political and functional positioning in such systems of secondary cities underexplored. Multi-level governance approaches focus on vertical and horizontal coordination mechanisms, yet they rarely interrogate how these mechanisms specifically shape the developmental trajectories of secondary cities. As a result, the existing literature offers limited understanding of the challenges faced by secondary cities in navigating mega-regionalization.

By recentering the analysis on secondary cities within these three conceptual domains, the conceptual framework innovates at two key levels. The first concerns the positive potential of mega-regionalization in helping secondary cities address unevenness, particularly in the Chinese context, where the authorities promote national planning agendas of spatial coordination. These top-down visions are examined as analytical tools across multiple spatial scales, helping to assess the extent to which they are translated into actionable strategies and implemented efficiently. The second aspect is the identification of the governance mismatches that emerge across these different scales, offering an explanation for why the promising vision of mega-regional coordination has so often failed to support secondary cities.

Through this conceptual framework, this research offers transferable analytical tools for broader comparative studies, informs future research on the challenges of secondary cities and suggests new pathways to address intra-regional unevenness.

Methodological Approach

To construct an explanatory conceptual framework from the perspective of secondary cities that captures the (in)efficiency of mega-regionalization in addressing uneven development, our research adopts a multi-dimensional methodological strategy:

- **From broad mapping to deep investigation:** Given that "secondary cities" are not a common analytical category in China, we intentionally avoid focusing on any single city or category from the beginning, which could lead to bias. Instead, we begin with a broad exploration of all non-core cities, innovatively applying a typological approach to classify them. This allows us to systematically analyze their diverse characteristics and challenges and select representative cases for vertical, in-depth investigation, enabling a more grounded understanding.

- **Cross-scalar thinking:** Core-secondary spatial relations are shaped and manifested differently across scales, from national level long-term visions to mega-regional level action-oriented plans, and local level active agency by secondary cities. Across these scales, core-secondary spatial relations are both the object of governance (to be optimized for coordination) and the instrument of governance (to reposition cities and realize the goals). This cross-scalar approach allows for a nuanced understanding of how secondary cities experience mega-regionalization on the ground, while also capturing the differentiated roles of governance actors across multiple levels.

- **Bridging planning discourse and implementation practice:** Our methodology mediates between "planning on paper" and "planning in practice". Planning documents are treated as key materials, reflecting the state's policy orientation, long-term mega-regional visions, and intended core-secondary collaboration. However, plans alone cannot capture the real dynamics as seen by actors in secondary cities. Thus, we also focus on the spatialization of visions, exploring how secondary cities attempt to implement these plans on the ground and the real-world obstacles they face, combining policy analysis with grounded fieldwork.

Policy transferability

This research ultimately aims to contribute with practical value by offering policy-relevant insights grounded in a deep understanding of the challenges faced by secondary cities and the mechanisms through which mega-regionalization influences their development. This includes actionable strategies to optimize core-secondary spatial relations and help these cities effectively respond to intra-regional unevenness.

On one hand, our study clarifies the mechanisms through which mega-regionalization fosters collaborative relationships between core and secondary cities. This provides opportunities for various stakeholders – planners, policymakers, and regional actors – to strategically navigate the coordination process in a more informed way. On the other hand, we seek to identify the governance mismatches and practical obstacles that secondary cities encounter in this process, thereby helping these actors anticipate and recognize problems and informing more targeted planning.

Our research also emphasizes the local scale through extensive fieldwork and in-depth interviews with local experts and senior officials, aiming to generate real impact on the development trajectories of secondary cities.. This grounded, practice-informed approach not only enhances the credibility and applicability of our findings but also enables meaningful feedback loops—translating theoretical insights into context-sensitive policy recommendations that support secondary cities in navigating mega-regionalization.

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For secondary cities, railways are among the most critical pieces of infrastructure. They connect these cities to wider regional systems, enabling access to broader resources, markets, and urban functions, and thus creating new development opportunities. At the same time, such connectivity may also accelerate the outflow of talent, investment, and industries, as these are increasingly polarized toward core cities.

Railway system in Anshan, photographed by Jiacheng Xu.

TOC

2 Understanding Chinese mega-regional secondary cities

A typology exploration

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ABSTRACT In this chapter, we apply the high-quality development (HQD) framework to distinguish core and secondary cities in Chinese mega-regional system. More importantly, this will guided us to further understand the characteristics and specific challenges of different secondary cities. The governmental initiative of HQD marks a shift in the Chinese development paradigm from prioritizing speed to prioritizing quality towards comprehensive goals of economic growth, social vitality, innovation capacity, industrial upgrading, regional cooperation, and green transformation. This initiative is increasingly discussed within the framework of mega-regions, with prior studies demonstrating that they are critical arenas for promoting HQD visions. However, unevenness within mega-regions has become an important limitation to this vision. Namely, significant disparities exist between mega-regional core cities and the smaller neighboring cities in most HQD indicators. This chapter conceptualizes these smaller players as secondary cities. Based on this, this chapter aims to understand and differentiate the specific challenges of secondary cities facing intra-regional unevenness in the context of HQD. We build an evaluation framework and employ the TOPSIS method to evaluate 34 core cities and 180 secondary cities. Then, we introduce typological thinking to develop a meaningful classification of secondary cities based on the results of these evaluations. K-means clustering analysis identifies five secondary city types with similar profiles.

The analysis supports the discussion of the characteristics and challenges of each type and may contribute to policy recommendations for a balanced HQD in mega-regional secondary cities.

KEYWORDS High-quality development, Mega-regional secondary city, Intra-regional unevenness, Typological analysis, TOPSIS, K-means clustering analysis.

2.1 Introduction

October 2017 witnessed an ideological shift in Chinese development paths, marked by the initiative of **high-quality development** (HQD). Since then, this initiative has guided Chinese socio-economic growth, industrial transformation, and regional governance (Pan et al., 2021; SCC, 2017). During the 13th Five-Year Plan period (2016-2020), governments, academics, and entrepreneurs debated HQD. It indicates that future Chinese development will no longer focus solely on speed but instead emphasize qualitative improvement. An increasing number of studies have focused on expanding the theory and related concepts (Bei, 2018; Li et al., 2019), selecting evaluation methods (Jiang et al., 2021; Song et al., 2022), and optimizing the implementation roadmaps for specific aspects of HQD (Cui et al., 2023; Xiong et al., 2022). These studies enriched the connotation of "quality" to include economic growth, social vitality, innovation capacity, industrial upgrading, regional cooperation, and green transformation. HQD brings together emerging development concepts under a comprehensive framework to promote coordinated development. For example, green transformation and low carbon are widely emphasized as new requirements for growth, but progress in the real economy should also be achieved through technological innovation, policy support, and multi-level governance (Wang et al., 2021). In summary, HQD encompasses multiple aspects, which are expected to form an efficient, complementary, and coherent system.

Mega-regions, spatial development units consisting of one or two cores and the surrounding smaller cities (Zhang et al., 2020), are of great value in facilitating the implementation of HQD. Mega-regionalization can be understood as establishing networks of cooperation and information exchange, the joint governance of regional crises and challenges, and the agglomeration of socio-economic activities (Liu, 2012; Wu and Zhang, 2007; Yeh and Chen, 2020). Therefore, it adds a new concern: HQD should not focus on each city per se but on the common goals of all regional urban areas. Current studies strongly support this idea, as more scholars

use mega-regions as frameworks to refine indicators to monitor the level of HQD (Yin et al., 2021), study specific actions and reflect on governance paths (Fu et al., 2022; Peng et al., 2020), and formulate spatial planning in terms of industrial distribution, land use, and environmental protection (Hu et al., 2021; Li et al., 2022). The mega-region concept was first raised in 2006 and specified in the 13th Five-Year Plan as the leading spatial framework of Chinese future urbanization (CNDRC, 2016). It originated from rethinking over-competitive urban relations, which had created a severe unevenness problem (Li and Wu, 2018). Thus, in realizing mega-regions, the authorities encourage regional alliances towards coordinated systems, including mobility of talent and knowledge, complementarity of industrial innovation strengths, and sharing of investment (Harrison and Gu, 2023).

In the last two decades, mega-regions have been increasingly emphasized around the world by both governments and academics for purposes of gathering talent, enhancing productive capacity, and promoting innovation (Florida et al., 2008) in order to compete in the globalized economy (Douglass, 2000). This competitive mindset gave rise to many global "superstar" cities, but also revealed the considerable costs of the single-city success, namely intra-regional unevenness, interpreted here as the development gap between the core cities of a mega-region and the other smaller secondary cities.

Indeed, global investment, branding, infrastructure development, and trade are primarily concentrated in the core cities of mega-regions, and surrounding smaller players often struggle to escape merely absorbing the negative externalities of core city success. For example, when the latter implement industrial upgrading or environmental regulations, low-end economic sectors are often relocated to neighboring secondary cities to ensure that the cores maintain the "sustainable development" label. This is often done in the name of "handouts for more secondary city development opportunities and employment for its residents" (Li and Jonas, 2023; Pendras and Dierwechter, 2022), exploiting the weak position of secondary cities in the regional system.

This unevenness has been investigated through comparisons with core cities, including the low capacity of secondary cities to retain urban functions such as commerce and culture (Cardoso and Meijers, 2016), their low attractiveness of development resources such as foreign direct investment (Creţan et al., 2005; Head and Ries, 1996), and their low political voice in the process of regional integration (Cardoso, 2016). On the other hand, development visions for secondary cities are also studied, such as smart city projects in secondary cities part of polycentric regions (Dragan et al., 2023), city branding to attract investment opportunities (Vesalon and Cretan, 2019), and the potential for metropolization to improve the

overall economic, functional and institutional capacity (Cardoso and Meijers, 2017). This has not always been successful, however, as some investments to implement large-scale urban functions, such as university campuses, had little impact because the attractiveness of secondary cities cannot compete with that of the cores (Cetin et al., 2021).

Although not enough attention has been paid to secondary cities in the Chinese context, this literature clearly helps us frame two problems that characterize these cities in China: polarization and peripheralization. On one hand, due to the significant development gaps, there is a unidirectional flow of development resources such as labor, investment, and technology to the core cities (Pang et al., 2023). Since transportation and information exchange channels between core and secondary cities become more intense in mega-regions, polarization is intensified (Huang and Zong, 2021). On the other hand, core cities, as the engines of economic growth of mega-regions, tend to receive preferential policy attention (Li and Jonas, 2023), while secondary cities become peripheralized with a diminishing political voice. In this chapter, we count all ordinary prefectural cities in Chinese 19 mega-regions, other than core cities, as secondary cities.

Existing research on the significant disparities of HQD within regions shows unevenness spread across various fields, including urban resilience (Wang et al., 2021), low carbon transitions (Wang et al., 2021), and overall socio-economic progress (Tian and Wang, 2019). Additionally, the performance of cities within particular mega-regions has been examined to assess the role of mega-regions as drivers of HQD, including ecological well-being (Lan et al., 2022), carbon emissions efficiency (Liu et al., 2018), and social vitality (Jiang et al., 2019). However, three crucial research gaps have not been covered. First, although evaluating the HQD of individual cities provides some evidence of development disparities, this does not focus on the unevenness between core and secondary cities in mega-regions. Therefore, it does not help us further understand polarization and peripheralization problems, as these relate specifically to core-secondary uneven relations. Second, studies of uneveness in individual mega-regions limit the value of the findings for comparability and transferability. Third, there is not enough literature summarizing the characteristics and challenges faced by secondary cities moving towards HQD, as these cities are often not the main focus, and scholars prefer to discuss unevenness at the regional scale.

To summarize, the existing literature reveals the disparity in HQD between core and secondary cities, but it remains unclear **in what ways do the challenges of intra-regional unevenness unfold across mega-regions and secondary cities with different characteristics in China?** We aim to answer this question in this chapter. To this end, we use a typological approach to classify secondary cities according to their performance gap to core cities in HQD visions. From there, we expect to derive a more nuanced understanding of how intra-regional unevenness takes shape in different types of cities. Building a typology of mega-regional secondary cities for the first time in the Chinese context helps us frame their characteristics in a more structured way and compare their challenges to provide targeted policy recommendations. This is an innovative approach, considering that currently scholars tend to categorize secondary cities roughly as "good performers" or "poor performers" without discussing their underlying features more deeply, which leads to blanket policies that neglect the specific combinations materializing "unevenness" in different places and between core and secondary cities.

We answer this question as follows. First, we review literature and policies related to the HQD initiative and develop an applicable analytical framework that incorporates the features of secondary cities in the context of intra-regional unevenness. In the second step, we select representative indicators based on that analytical framework and develop a methodology to explore the characteristics of the performance gap between core and secondary cities. This is achieved through two approaches. We firstly employ the TOPSIS evaluation method to measure the HQD performance of each city. Then, we conduct a K-means clustering analysis based on the performance gap between core and secondary cities to group cities facing similar unevenness conditions and lay the foundation for further discussion of their common challenges. Then, we summarize the different types of secondary cities based on the evaluation and clustering results. Furthermore, we discuss the challenges of secondary cities facing intra-regional unevenness. The chapter concludes by elaborating on the policy implications for the HQD of mega-regional secondary cities. By providing a typology-based exploration of Chinese secondary cities in mega-regional systems, we contribute to policy formulation and academic research, and show that the concept of "secondary city" is applicable in China, a context with different spatial scales, governance paradigms, and socio-economic statuses than those of the Global North. This expands the discussion on "secondary cities" globally, and provides an analytical basis to respond to their challenges.

2.2 High-quality development and mega-regional secondary cities

2.2.1 Six aspects of HQD

Existing literature discusses the driving forces, evaluation indicators, and crisis resolution of HQD as a more sustainable development goal compared to past rapid development paths (Bei, 2018; Pan et al., 2021). On this basis, HQD consists of six aspects:

1. **First, it remains centered on development**, emphasized in the 14th Five-Year Plan (CNDRC, 2021). Despite the increasing focus of authorities on slowing down the speed of development and upgrading its quality, economic progress remains an important consideration (Pan et al., 2021). This is because the expansion of infrastructure, innovative capacity, social welfare, climate change response, and industrial structure upgrading require a strong economy as a foundation.
2. **Second, HQD makes social vitality a critical agenda**, and people's well-being and social prosperity are recognized as essential indicators for examining the fruits of economic development (Liu et al., 2020).
3. **Third, HQD targets innovation as a driving force**. As a core factor driving social vitality and economic progress, innovation is widely recognized as an essential reflection of competitiveness (Liu et al., 2021).
4. **Fourth, industrial upgrading is a crucial path to HQD**. These challenges the traditional high-pollution, high-energy-consumption, and labor-intensive industrial clusters and looks to emerging technologies and industries to facilitate industrial transformation and upgrading (Song et al., 2022).
5. **Fifth, openness and regional cooperation are core components of HQD**. This promotes a coordinated and well-balanced development pattern to share the development results and emphasizes a just and inclusive development environment based on the free flow of information, investment, and talent (CNDRC, 2021).
6. **Sixth, green transformation is a fundamental requirement for HQD**. The rapid development of China over the past forty years has come at the cost of environmental pollution and ecological degradation, and authorities have imposed strict regulations on this issue (Chen et al., 2021). Environment, energy, and ecology have become the three-alarm bells in the HQD process.

2.2.2 Secondary cities in the context of HQD

It must be recognized and seriously considered that the unevenness between cities limits the vision of HQD being achieved by all Chinese cities. The concept of the mega-region helps us to think about this issue. From an industrial upgrading perspective, for example, core cities tend to have stronger economic, innovation, and governance capabilities to optimize their industrial structure. Besides, they also have a concentration of talent, technology, and investment, which is crucial for social vitality and urban innovation. Secondary cities are less fortunate. They need to withstand the loss of talent and investment due to huge attractiveness of the neighboring core while adapting to the new development requirements, balancing economic progress with the multiple tasks of turning city green, open, and improving well-being of its inhabitants.

Despite their multiple challenges, the authorities have not neglected secondary cities but have considered them key players in regional coordination to achieve overall regional HQD. In recent years, mega-regional policies and territorial spatial planning have explicitly envisioned these cities as new targets on their paths to HQD. Regarding development, the size of secondary cities is often expected to expand to rebalance the regional spatial structure. In the Yangtze River Delta, while the core city of Shanghai is strictly regulated for urban construction and expansion, neighboring secondary cities, such as Taizhou, enhance their capacity for population agglomeration by relaxing the restrictions on resident registration and social welfare guarantees (DNR Jiangsu, 2021). This is also related to the economic prospects of secondary cities as they want to attract more high-end industries to optimize the local industrial structure. Constructing new business parks to provide sufficient development space to attract investment is a widely used policy (Zheng et al., 2017). In terms of social vitality, secondary cities are often seen as more livable alternatives to large cities due to their lower social pressure and living costs, and better living environment (Dou and Kuang, 2020; Zhan et al., 2018). Therefore, social vitality is expected to attract talent and investment in secondary cities, offering distinctive cultural activities, a vibrant atmosphere, and welfare benefits. Regarding innovation, core cities are often identified as regional innovation centers, and secondary cities should also benefit from this. For example, in the Beijing-Tianjin-Hebei mega-regional plan, secondary cities such as Baoding and Qinhuangdao, located in the surrounding area of Beijing, are expected to combine the innovative output from the core with their own industries to promote innovation capacity (DNR Hebei, 2021). However, the endogenous innovation capacity of these cities also needs government support to better integrate into the regional innovation network. In terms of industrial structure, a competitive set of industries that complements the strengths of other cities is envisioned (CNDRC, 2021). Regarding cooperative development,

integration into regional development networks and open markets is especially necessary in secondary cities. This not only facilitates the exchange of information, technology, and talent among cities but also brings them more development opportunities based on the support of neighboring core cities. Finally, in terms of green transformation, ecological and environmental quality and carbon efficiency are becoming new strengths to support their important role in the regional system (Lu and Campbell, 2009; Rong et al., 2018). These six dimensions of HQD summarize the visions in mega-regional planning and policies for secondary cities and help us to rethink more precisely the unevenness problem in mega-regional systems.

2.3 Research design

2.3.1 Evaluation framework to quantify intra-regional unevenness

This chapter intends to achieve a two-fold objective. First, to construct for the first time a typology of secondary cities from the perspective of HQD trajectories in mega-regional systems. Second, to use that typological discussion to reveal the characteristics of each type and the challenges it faces, ultimately contributing to policy formulation, implementation, and optimization of mega-regional secondary cities. For this purpose, we consider all the 19 megaregions specified in the 14th Five-Year Plan (CNDRC, 2021). After filtering for practical considerations such as lack of data, we select 180 secondary cities (all at the prefecture-level city scale) as the study object. The mega-regional core cities consist of four municipalities directly under the central government's jurisdiction, the provincial capitals, and the sub-provincial cities, with a total number of 34.

We start by quantifying intra-regional unevenness as the gap between mega-regional secondary cities and core cities in various aspects of HQD. Therefore, we construct an evaluation framework based on the HQD vision set for the secondary cities and develop 18 indicators in the six aspects mentioned earlier: urban size, social vitality, innovation capacity, industrial structure, regional embeddedness, and green transformation. These six aspects build a comprehensive assessment of HQD in Chinese cities, and have been widely used by previous studies (Pan et al., 2021; Song et al., 2022; Yang et al., 2021). However, scholars have not agreed on specific

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indicators to measure unevenness between core and secondary cities. Therefore, we elaborate on the policy orientations and visions of secondary cities towards the six aspects of HQD to formulate the evaluation framework.

For urban size, besides the traditional indicators of population and economic strength, we use the urban built-up area as a crucial proxy because the available space for urban expansion has become an important development asset for secondary cities to participate in mega-regionalization (Gao et al., 2020; Huo et al., 2020). For social vitality, we use a modified nighttime lighting index to capture daily life vitality, taking advantage of its objectivity and accuracy (Lan et al., 2020; Ortakavak et al., 2020), together with indicators representing cultural and social vitality. For innovation capacity, we include academic chapters to evaluate the city's capacity for scientific innovation, considering that patent data can only reflect innovation to a certain extent (Cao et al., 2022), and also consider the governmental expenditure for scientific research (Pan et al., 2021). For industrial structure, we consider the proportion of agriculture, industry, and services in the overall output to determine the characteristics of each city's economy (Song et al., 2022). For regional embeddedness, infrastructure connectivity is often the most important consideration, but to reflect the increasing importance of information flows we also measure informational visibility (Lin et al., 2019). We add an indicator of entrepreneurial cooperation and market openness, as these are key tenets of competitive mega-regions. Finally, we evaluate green transformation in its environmental, ecological, and energy dimension through three proxies: air pollution index (PM 2.5), vegetation quality index (NDVI index), and carbon intensity (Aksoy et al., 2022; Lin and Jiang, 2022; Tang et al., 2021).

By combining existing literature and relevant policies to construct a solid theoretical foundation, collecting the indicators from multiple data sources, including yearbook data, geospatial data, and indexes published by academic institutions, and verifying the accuracy of the indicators through literature in different fields, this evaluation framework is suitable to measure unevenness between core and secondary cities in the HQD perspective. Table 2.1 shows the indicators and data sources. We selected the 2020 data for our study because that year is the beginning of the 14th Five-Year Plan, marking a new stage in which mega-regions became the leading carrier of future urbanization in China (CNDRC, 2021).

TABLE 2.1 Evaluation framework and representative indicators of HQD

Aspects of HQD	Vision for secondary cities	Representative indicators	Code	Data source
Urban size-Quality of development foundation	Population concentration	Population (total)	POP	Yearbook (NBS, 2021, 2012)
	Economic growth	GDP (total)	GDP	Yearbook (NBS, 2021, 2012)
	Space for development	Urban built-up area (total)	BUILT	National Land Survey (MNRC, 2022)
Social vitality-Quality of social development	Daily life vitality improvement	Nighttime light strength (annual mean)	NTL	Harvard Dataverse (Wu et al., 2021)
	Cultural vitality progress	Library books (per capita)	LIB	Yearbook (NBS, 2021, 2012)
	Social welfare guarantee	Pension insurance for employee (percentage)	INSUR	Yearbook (NBS, 2021, 2012)
Innovation capacity-Quality of innovative development	Practical innovation	Patents (per capita)	PAT	Collected from CNKI, *www.cnki.net*
	Scientific innovation	Scientific chapters (per capita)	WOS	Collected from Web of Science, *www.webofscience.com*
	Innovation support	Governmental expenditure for scientific research (per capita)	EXP	Yearbook (NBS, 2021, 2012)
Industrial structure-Quality of industrial development	Primary industries	Primary industrial income (percentage)	PRI	Yearbook (NBS, 2021, 2012)
	Secondary industries	Secondary industrial income (percentage)	SEC	Yearbook (NBS, 2021, 2012)
	Tertiary industries	Tertiary industrial income (percentage)	TER	Yearbook (NBS, 2021, 2012)
Regional embeddedness-Quality of open development	Infrastructural connection	Regional transportation land use (percentage)	INFRA	National Land Survey (MNRC, 2022)
	Informational visibility	Baidu index (annual mean) *	INFOR	Collected from *index.baidu.com*
	Financial inclusion	Financial inclusion index (aggregate)	FINA	Digital Finance Research Center at Peking University (Guo et al., 2020)
Green transformation-Quality of environmental, ecological, and energy efficient development	Environment quality	PM 2.5 (annual mean)	PM2.5	ChinaHighPM2.5 (Wei et al., 2020)
	Ecology quality	NDVI index (annual mean)	NDVI	National Ecosystem Science Data Center (Yang et al., 2019)
	Energy efficiency	Carbon intensity (annual mean) **	CARB	The Emission Inventories for 290 Chinese Cities (Shan et al., 2022)

** Due to the effect of covid-19, the Baidu index of Wuhan and some other cities is abnormally high in 2020, so we pick the data of 2019 for the study.*

*** Carbon intensity data are selected for 2010 (instead of 2011) and 2020 due to limitations in data accessibility.*

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2.3.2 Applied methodology: TOPSIS evaluation and K-means clustering analysis

The evaluation framework and the collected data can examine the HQD performance of both core and secondary cities. On this basis, we subtract the secondary cities' performance values from their corresponding core cities to obtain a quantitative description of the observed unevenness. The **Technique for Order of Preference by Similarity to Ideal Solution** (TOPSIS) is used to calculate the specific performance value of each city in each particular HQD aspect. The purpose of quantifying intra-regional unevenness is to build a typology of secondary cities based on this general condition. That is, some degree of disparity with the core city under the HQD framework is taken as an attribute of the secondary city, and we group cities with similar attributes together to frame their typology using **K-means clustering**. As a widely used unsupervised cluster analysis method, K-means is increasingly adopted in urban research. For example, Cardoso (2022) has demonstrated its applicability by creating a typology of British secondary cities based on their demographic composition. This method focuses on the attributes of the given data to ensure the maximum difference between different clusters and the maximum similarity of all elements in the same cluster (Xu et al., 2018). K-means requires a pre-determined K's value before clustering, that is, the number of different types we expect to extract. Silhouette coefficients are a reliable method to determine that value (Wang et al., 2017). After building the secondary city typology, we summarize each cluster's characteristics based on the TOPSIS analysis results. Also, we visualize the results by GIS to observe the spatial distribution of each type in the mega-regional system.

However, focusing only on the evaluation results according to the gap between core and secondary cities is not enough to determine what factors challenge HQD in these cities, considering that mega-regions are dynamic and complex systems (Yeh and Chen, 2020). Therefore, we use the same TOPSIS method to compare these cities' performance in 2011 and 2020, observing their rise or fall in the regional system. We do not focus on these cities' absolute change because, generally, almost all cities should have made considerable progress over ten years. Instead, we are more interested in development trends in the position change of these cities, making TOPSIS a suitable tool because it essentially determines the performance of a city by calculating the distance between the best and worst cases (Chen et al., 2018). This helps us screen which cities are benefiting from the mega-regional system and improving their position and which are being left behind. Accordingly, we once again conduct a K-means clustering analysis to find different trends in secondary cities according to their progress in HQD. This analysis is conducted in R and Python, and the code is available on request.

2.3.3 TOPSIS to evaluate the city's performance in HQD

TOPSIS measures the distance between the objective performance and the positive and negative ideal values and uses this to represent the evaluation results (Chen et al., 2018). This method was initially used for multidimensional decision-making. The positive and negative ideal solutions are first decided based on considering the total cost, side effects, and other factors (Zhang et al., 2022a). Subsequently, all possible solutions are ranked according to their distance from the best and worst solutions to support decision-making. In recent years, an increasing number of scholars have used this method to evaluate cities in terms of low carbon levels, sustainable development, and innovation capacity (Chen et al., 2020; Chen and Zhang, 2021; Long et al., 2021). The methodology is suitable for evaluating and comparing different aspects of HQD in core and secondary cities and is specified in the multi-step description as follows.

— **Step 1:** We collect data for the developed evaluation framework and obtain a matrix $\boldsymbol{A = (a_{ij})_{m\times n}}$, with 18 indicators on the horizontal axis and 34 core cities and 180 secondary cities on the vertical axis. Here, $\boldsymbol{i=1, 2, \ldots, m}$, represents a list of $\boldsymbol{m}$ cities; $\boldsymbol{j=1, 2, \ldots, n}$, represents a list of $\boldsymbol{n}$ indicators.

$$A = (a_{ij})_{m\times n} = \begin{pmatrix} a_{11} & a_{12} & \ldots & a_{1n} \\ a_{21} & a_{22} & \ldots & a_{2n} \\ \ldots & \ldots & \ldots & \ldots \\ a_{m1} & a_{m1} & \ldots & a_{mn} \end{pmatrix}$$

— **Step 2:** We determine the positive and negative ideal solution of each indicator. For positive indicators, the maximum value is the best ideal solution and vice versa. In our evaluation framework, the concentration of PM2.5 and carbon intensity (carbon emissions per unit of GDP) are negative indicators, which means that for these two indicators, the smaller the value the closer to the best ideal situation.

— **Step 3:** For the normalized data, in each dimension (evaluation indicator), the maximum value is the positive ideal solution, and the minimum value is the negative ideal solution. We then get two aggregations: $\boldsymbol{V^+}$ represents the maximum value in the ***jth*** evaluation indicator, and $\boldsymbol{V^-}$ represents the minimum value in the ***jth*** evaluation indicator.

$$V^+ = (V_1^+, V_2^+, \ldots, V_n^+)$$

$$V^- = (V_1^-, V_2^-, \ldots, V_n^-)$$

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— **Step 4:** After determining the positive and negative ideal solutions, we calculate the performance based on the distance from the target value to the ideal solutions. Where V_{ij} represents the normalized value of city ***i*** in the ***jth*** evaluation indicator:

Distance from the positive ideal solution:

$$D_{ij}^{+} = \sqrt{\left(V_{ij} - V_{j}^{+}\right)^2}$$

Distance from the negative ideal solution:

$$D_{ij}^{-} = \sqrt{\left(V_{ij} - V_{j}^{-}\right)^2}$$

TOPSIS-evaluated performance of city ***i*** in the ***jth*** evaluation indicator:

$$Performance_{ij} = \frac{D_{ij}^{-}}{D_{ij}^{+} + D_{ij}^{-}}$$

Finally, we obtain the matrix $B = (Performance_{ij})_{m\times n}$, which represents the results of the evaluation. It is worth noting that we do not expect an overall evaluation result by adding up all the weighted values of each indicator, which is often achieved through the entropy method or expert interviews. Instead, we want to see the performance results for each indicator specifically, in order to conduct the subsequent clustering analysis.

$$B = \left(Performance_{ij}\right)_{m\times n} = \begin{pmatrix} p_{11} & p_{12} & \cdots & p_{1n} \\ p_{21} & p_{22} & \cdots & p_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ p_{m1} & p_{m1} & \cdots & p_{mn} \end{pmatrix}$$

— **Step 5:** Matrix $B = (Performance_{ij})_{m\times n}$ is the TOPSIS evaluation result. Based on this, we subtract the results of the secondary city from the results of the corresponding core cities $Performance_{ij}^{core}$ to obtain matrix $C = (Gap_{ij})_{m\times n}$, which represents the quantified intra-regional unevenness. Using the same methodology, we measure the performance of the secondary cities in the year 2011, $Performance_{ij}^{2011}$, and compare it to the year 2020 to obtain matrix $D = (Trend)_{m\times n}$, which represents the development trend of a city. Both matrices $C = (Gap_{ij})_{m\times n}$ and $D = (Trend)_{m\times n}$ support the K-means cluster analysis.

$$Gap_{ij} = Performance_{ij} - Performance_{ij}^{core}$$

$$C = \left(Gap_{ij}\right)_{m\times n} = \begin{pmatrix} g_{11} & g_{12} & \cdots & g_{1n} \\ g_{21} & p_{22} & \cdots & g_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ g_{m1} & g_{m1} & \cdots & g_{mn} \end{pmatrix}$$

$$Trend_{ij} = Performance_{ij} - Performance_{ij}^{2011}$$

$$D = \left(Trend_{ij}\right)_{m\times n} = \begin{pmatrix} t_{11} & t_{12} & \cdots & t_{1n} \\ t_{21} & t_{22} & \cdots & t_{2n} \\ \cdots & \cdots & \cdots & \cdots \\ t_{m1} & t_{m1} & \cdots & t_{mn} \end{pmatrix}$$

2.4 Preliminary exploration of clustering analysis

2.4.1 Five types of secondary cities

The **Silhouette Method** is employed to determine the specific value of K in the clustering analysis, that is, the number of potential clusters. Accordingly, we distinguish five secondary city types based on 18 specific indicators of HQD. Although we find a few overlaps upon visualization of the principal component analysis (PCA), the results are promising for distinguishing a typology of secondary cities (Figure 2.1).

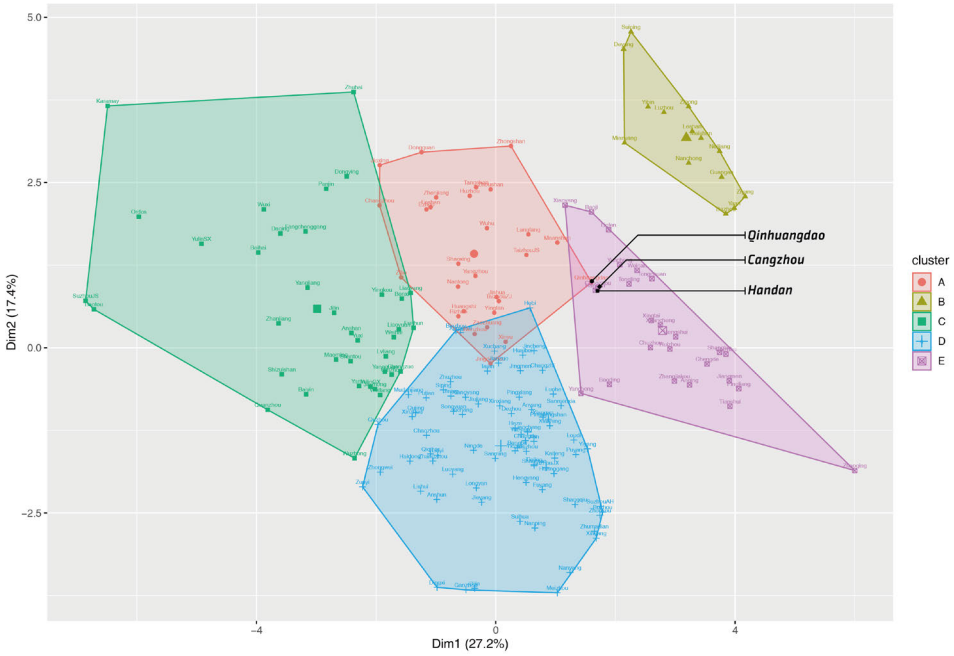

FIG. 2.1 Clustering analysis results visualized based on the PCA approach

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The overlaps are visible because, on one hand, PCA is not used to depict all the city's attributes but rather to obtain a more intuitive visual representation through dimensionality reduction (Reddy et al., 2020), in this case consolidating 18 indicators into 2 dimensions for visualization. In this process, a small partial loss of information is inevitable. On the other hand, cities at the intersection may be characterized by two different types simultaneously. For example, Qinhuangdao, categorized as type A, overlaps with type E. The two cities beside it, Cangzhou and Handan, are categorized as type E. However, all three cities belong to the Beijing-Tianjin-Hebei mega-region, and their socio-economic development, industrial structure, and culture are relatively similar. We explore the specific characteristics of each type in the next section and find support for this argument.

Mapping the locations of the different types of cities allows a preliminary observation that, although none of the indicators used determines location, there is some systematic spatial clustering of cities with similar features (Figure 2.2). Type A (n=28) is mainly concentrated in the Yangtze River Delta mega-region, the wealthiest part of China. There are also sporadic distributions in the Pearl River Delta and other mega-regions. Cities known for their social vitality and livability are included, such as Zhongshan and Yangzhou (Yi et al., 2021). Smaller cities such as Dongguan and Langfang, which have experienced industrial upgrading in recent years (Li et al., 2020), are also included in this cluster. Type B (n=14) is entirely concentrated in the Chengdu-Chongqing mega-region. These are smaller, less socio-economically developed cities. Type C (n=37) is more concentrated in the Northeast and Western mega-regions, often considered underdeveloped or experiencing industrial difficulties. However, some well-developed cities, such as Suzhou in the Yangtze River Delta, are also categorized in this cluster. Type D (n=76) is the most numerous and is more concentrated in the mega-regions in central China. Type E (n=25) is found on the fringes of the giant mega-regions, where some cities are experiencing difficulties in industrial transformation.

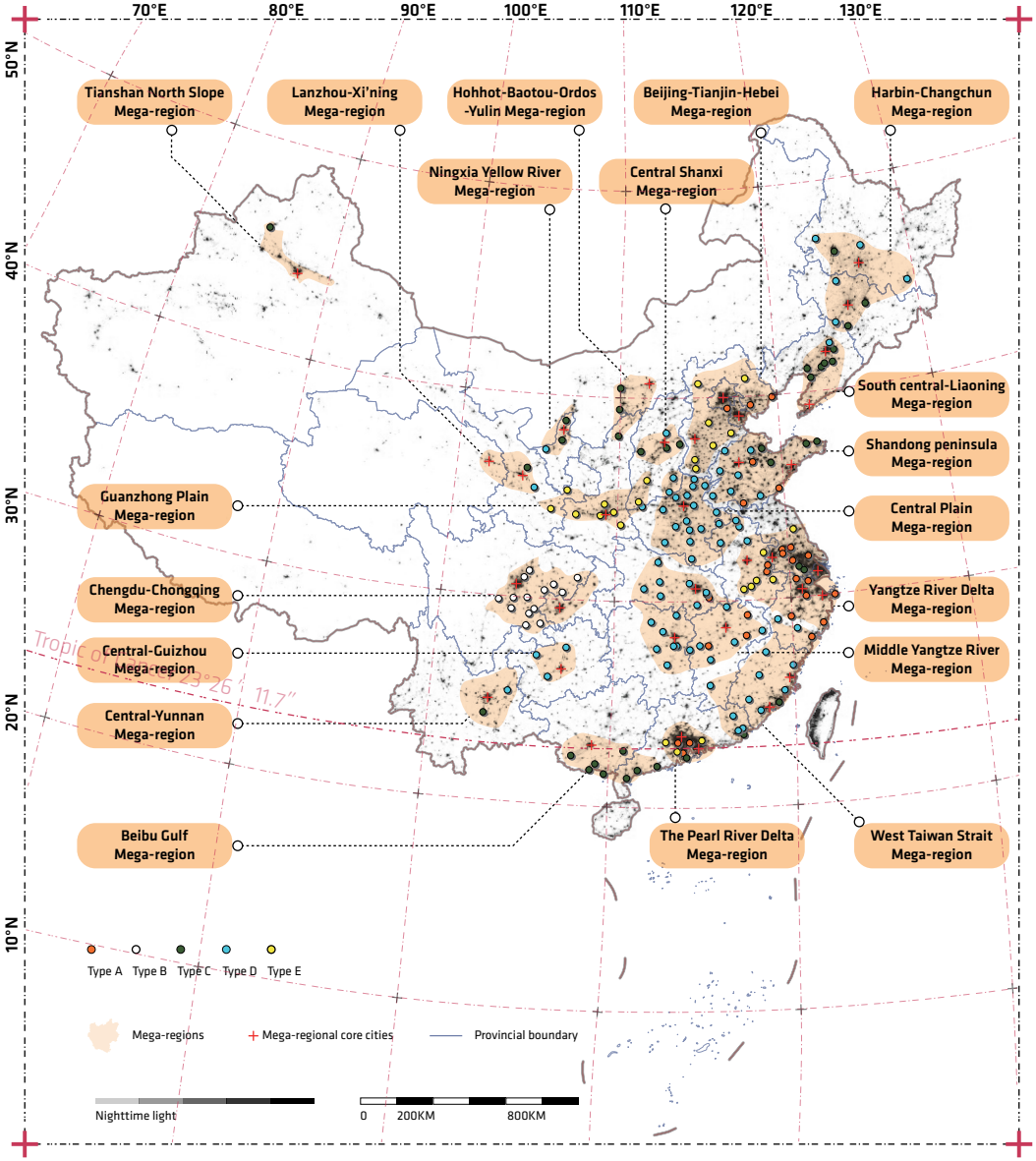

FIG. 2.2 Spatial distribution of five types of secondary cities

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2.4.2 What distinguishes core cities from secondary cities?

This chapter follows regional planning documents to identify core and secondary cities in mega-regions rather than distinguishing between them through quantitative measurements. This results in uncertainty about what specific factors differentiate core cities from secondary cities and where the development gaps lie (Figure 2.3). Therefore, we look at the average performance of all core cities and each type of secondary city across the six HQD dimensions to identify their overall differences. Here, we find similarities in the performance of all secondary cities when compared with core cities, allowing us to generalize their respective patterns of difference.

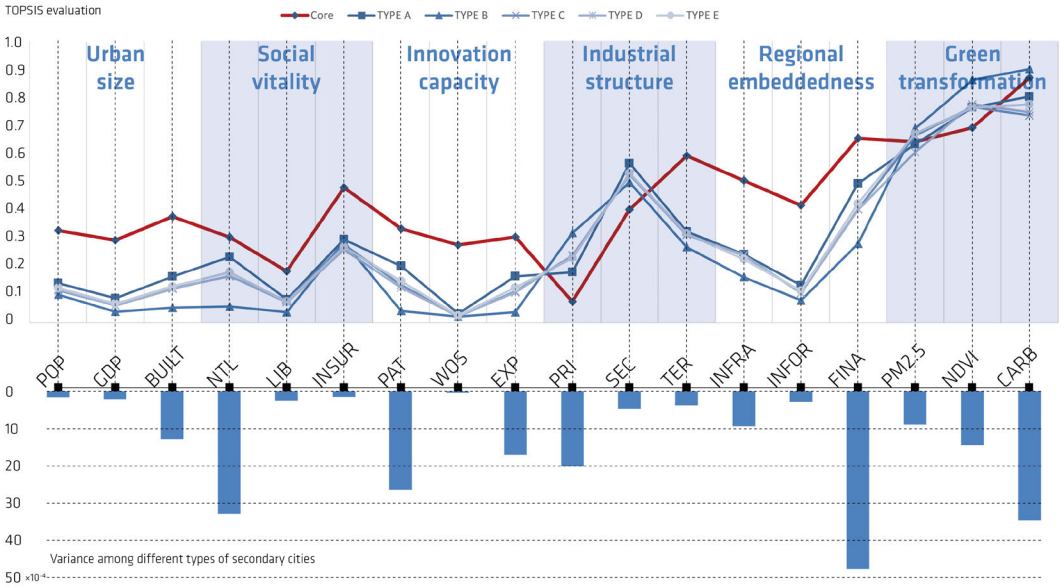

FIG. 2.3 Compare HQD performance in core and secondary cities

First, core cities significantly outperform secondary cities in size, innovation capacity, and regional embeddedness. The gaps are considerable, especially in economic growth, scientific innovation, and information embeddedness. All the different types of secondary cities perform equally poorly in scientific innovation, which may be an important factor of intra-regional unevenness. As for financial embeddedness, there is a wide disparity among different types of secondary cities. Second, there is not a very large gap between core and secondary cities in the social vitality aspect. The gaps in nighttime light strength and library books are small, which contradicts an initial impression of the difference between busy and vibrant big cities and

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depressed small cities. Social vitality, thus, may be a potential pathway to repair the weaker position of secondary cities in the regional system. However, nighttime light differences suggest that social vitality varies significantly among different types of secondary cities. Third, core cities are dominated by tertiary industries, while secondary industries characterize most secondary cities. Lastly, core cities do not perform better than secondary cities in all aspects, as illustrated by the quality of the green transformation. We can see that core cities do not perform optimally in any of the three lenses of environment, ecology, and energy and are often surpassed by secondary cities.

These preliminary findings show that, first, focusing on non-core cities in mega-regions and conceptualizing them as secondary cities is necessary in the context of uneven HQD, because all secondary city types are significantly left behind compared to core cities in several aspects. Second, different types of cities have significant variations, suggesting that although they might seem similar compared to the core cities, there are also considerable differences from type to type. The following section discusses how these differences characterize the various types of secondary cities.

2.5 Characterizing different types of secondary cities

The results of the clustering analysis allow us to summarize five secondary city types based on their performance gaps with their core cities in different aspects of HQD. In this section, we focus on the overall features of each type. Accordingly, we named each secondary city type according to their different characteristics (Table 2.2): (type A) Strong contenders in great mega-regions, (type B) Small players in-between large metropolises, (type C) Pseudo-capitals challenging dominant cores, (type D) Moderate followers, and (type E) Strugglers under the metropolitan shadow. The corresponding data graphics can be accessed in the appendix.

TABLE 2.2 Five types of secondary cities

	TYPE-A	TYPE-B	TYPE-C	TYPE-D	TYPE-E
Role in the regional system	Strong contenders in great mega-regions	Small players in-between large metropolises	Pseudo-capitals challenging dominant cores	Moderate followers	Strugglers under the metropolitan shadow
Urban size	Significant gap with the cores, similar to (but better than) cities in TYPE E	Very large gap with the cores	Small gap with the cores, a few cities larger than the cores	Small gap with the cores	Significant gap with the cores, similar to (but worse than) cities in TYPE A
Social vitality	Small gap with the cores	Large gap with the cores in library books and employee pension, small gap in nighttime light	Small gap with the cores, a few cities better than the cores	Large gap with the cores in nighttime light and employee pension, but small gap in library books	Very large gap with the cores
Innovation capacity	Large gap with the cores	Significant gap with the cores, but only worse than TYPE C	Small gap with the cores, a few cities better than the cores	Significant gap with the cores, slightly worse but similar to TYPE B	Very large gap with the cores
Industrial structure	Low proportion in primary sector, high in secondary sector	Low proportion in secondary sector	Low proportion in primary sector, high in secondary sector	Low proportion in secondary sector, high proportion in tertiary sector	Very low proportion in tertiary sector
Regional embeddedness	Significant gap with the cores, but only worse than TYPE C	Very large gap with cores especially in informational visibility	Small gap with the cores, a few cities better than the cores	Large gap with the cores`	Very large gap with the cores especially in informational visibility and financial openness
Environment, ecology, and energy sustainability	Average gap in all aspects	Small gap in carbon intensity Significant gap in ecological conservation (NDVI index)	Large gap in ecological conservation (NDVI index) and carbon intensity	Better than cores in ecological conservation (NDVI index)	Better than the cores in terms of ecological conservation. Large gap in carbon intensity and environmental quality

We also find four different development trends in secondary cities according to their progress and regression by comparing the data in the years 2020 and 2011 (Figure 2.4). The first trend is most prominent in economic progress, and we find a significant decrease in the proportion of the primary industries and rapid growth in the secondary industries in these cities. The second trend shows the decline of secondary industries and the rapid growth of tertiary industries, with an improved ecological performance. Therefore, these two groups of cities are undergoing industrial transformation and optimization of their economic structure. The third trend corresponds to cities that show a decline: the proportion

of primary industries has risen significantly, while other industries face difficulties. These cities are not performing well in size, social vitality, and low carbon-related activities. Secondary cities in the fourth trend show significant improvements in their secondary industrial growth, size, regional embeddedness, and social vitality. Notably, their growth in innovation capacity is superior to other types. However, we also find that their ecological quality has regressed. These four trends provide meaningful insights to define specific challenges of different types of secondary cities in the face of HQD initiatives.

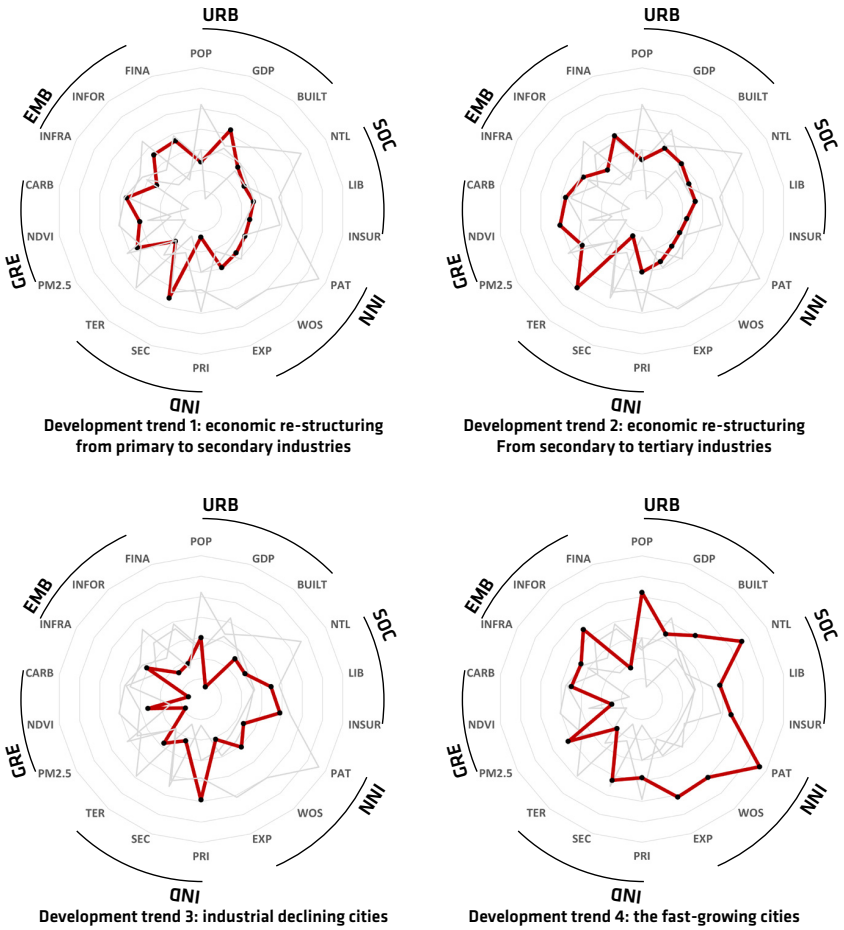

FIG. 2.4 Four trends of secondary cities' HQD
Note: URB-urban size; SOC-social vitality; INN-innovation capacity; IND-industrial structure; GRE-green transformation; EMB-regional embeddedness

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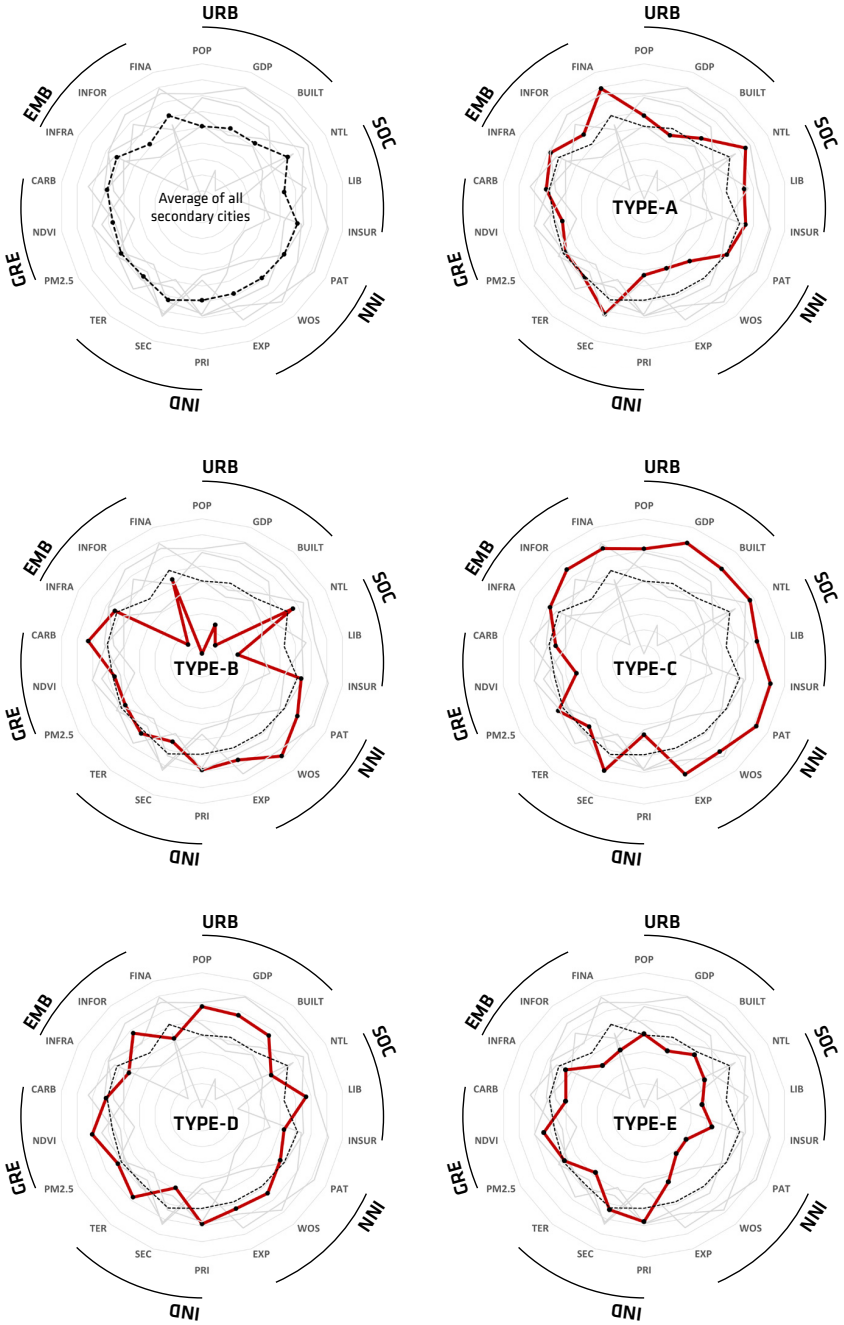

FIG. 2.5 HQD profile of five types of secondary cities

Note: URB-urban size; SOC-social vitality; INN-innovation capacity; IND-industrial structure; GRE-green transformation; EMB-regional embeddedness

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2.5.1 TYPE-A: Strong contenders in great mega-regions

Secondary cities in type A are characterized by a significant gap with their cores regarding urban size, innovation capacity, and regional embeddedness. Spatially, these cities are mainly located in the Yangtze River Delta, including Changzhou and Wenzhou, which are highly developed prefectures (Figure 2.6). Here, the gap with the cores reflected in the analysis does not indicate that these cities are lagging behind. On the contrary, the majority of type A outperforms the overall average of secondary cities in all aspects of HQD. The gap is because these cities have the most prosperous cores to compare with: Beijing, Shanghai, Shenzhen, and Guangzhou. Other findings support this argument, such as the social vitality aspect, where there is no significant gap between both. Cities like Dongguan in the Pearl River Delta and Jiaxing in the Yangtze River Delta even have a higher nighttime light index than the cores. A high proportion of secondary industries also characterizes this type. Foshan, adjacent to Guangzhou, has been an important manufacturing base since the 1980s (Tan et al., 2014). These cities have a very low proportion of agricultural output, and their tertiary industry proportion is much lower than in the cores. This suggests that most cities in type A share a complementary economic structure with their cores. In addition, the financial inclusion index of these cities is also higher than other types, indicating that they perform well regarding entrepreneurial and financial activities.

The development trends also confirm that these cities are performing well. Most cities show the fourth trend, meaning they have made significant progress in urban size, innovation capacity, increase of secondary industries, and regional embeddedness (mainly regarding informational visibility) over the past decade. However, some cities in the Shandong and the Beijing-Tianjin-Hebei megaregions show the third trend: a decline in industry, social vitality, and innovation capacity. Tangshan is a famous case for this. Once known for its highly developed coal and steel industries, the city's economic development has suffered a bottleneck in the context of national economic structural optimization and higher demands for environmental quality since the millennium (Xu et al., 2021). This industrial transformation challenge is also reflected in the carbon intensity of Tangshan, which is much lower than others in type A. In summary, although not all cities have made significant progress, they are at the forefront of secondary cities, suggesting a competitive role in mega-regional systems.

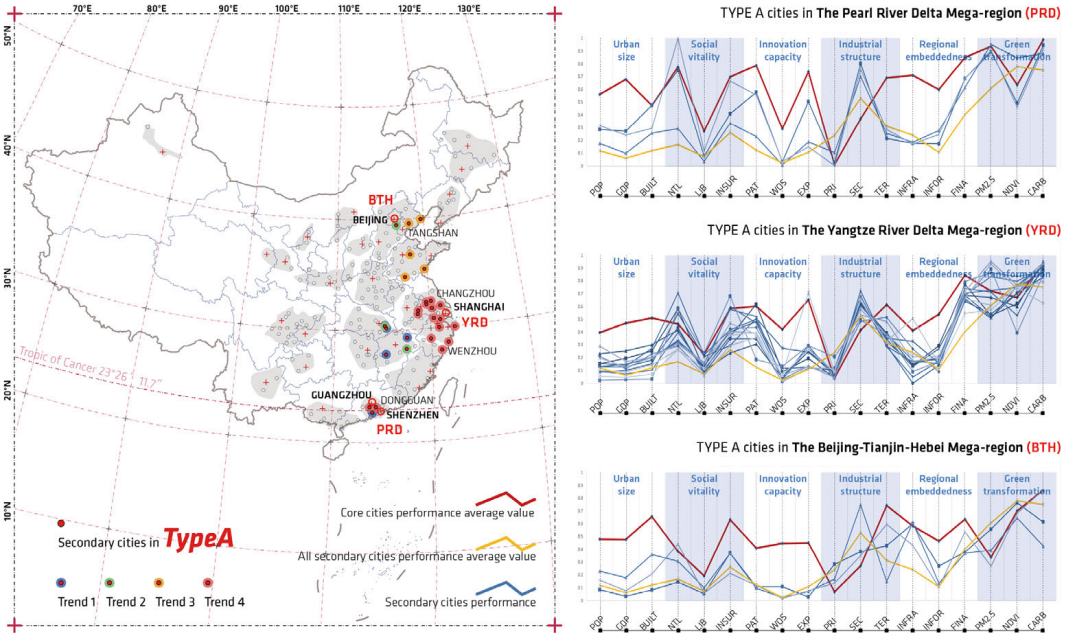

FIG. 2.6 Profile of Type A

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2.5.2 TYPE-B: Small players in-between large metropolises

Type B cities are only found in the Chengdu-Chongqing mega-region (Figure 2.7). These cities are remarkable for the huge gaps in urban size and regional embeddedness, especially in population, urban built-up area, and information visibility. On one hand, these cities are smaller and less visible than most other secondary cities. On the other hand, the cores of this mega-region are two of the largest and most vibrant metropolises in China, with Chongqing as the most populated city with 32 million inhabitants (Zhang et al., 2022b). These two reasons make the urban size disparity the most distinctive feature of type B. In addition, from an industrial structure perspective, these cities have a higher proportion of agriculture than other types and a large gap in the proportion of tertiary industry within their cores.

Despite the small size and the large proportion of primary industries implying that this type of city lies at a lower development stage, they do not have a massive gap with their cores in terms of social vitality and innovation capacity. This is not because they perform better in these two aspects, as they are worse than the average of all secondary cities. Rather, Chengdu and Chongqing also underperform in these two aspects, which does not align with their discussed portrait as livable and important hubs for scientific research in Western China (Hou et al., 2023). We believe this is because when processing the data, we chose the demographic averages of the indicators to standardize for the evaluation, and the very large population bases of these two cores result in this phenomenon.

In terms of development trends, the cities of type B are not showing either a decline or a high growth rate, but are undergoing an economic structural transformation. This means that these small players in the mega-regional system are not shrinking because they are sandwiched between two cores casting their metropolitan shadows, but they have not significantly benefited from the regional network coming from the spillover effects of the cores.

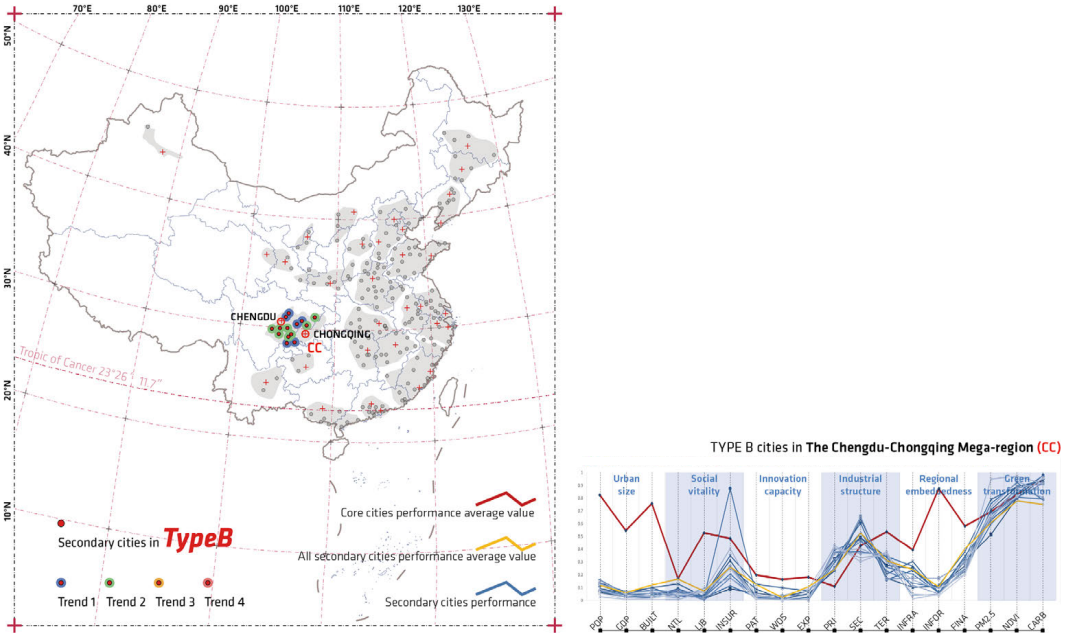

FIG. 2.7 Profile of Type B

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2.5.3 TYPE-C: Pseudo-capitals challenging dominant cores

When only considering the HQD gap between secondary cities and their cores, type C cities are the best performers. We name them “pseudo-capitals” because they have a relatively small gap or even outperform their cores in size, social vitality, innovation capacity, and regional embeddedness (Figure 2.8). However, when we look at the location and development trends, we see that not all pseudo-capitals perform well in the mega-regional system. On the contrary, most of these cities are in socio-economically backward mega-regions, suggesting a distinction of Type C into two separate subcategories. The first are the truly central secondary cities, such as Suzhou in the Yangtze River Delta, and Quanzhou in the Western Straits mega-region. These cities are very few, but their performance is much higher than average. In regional planning, they often form strong alliances with their cores, such as the Shanghai Metropolitan Area and the Xiamen-Zhangzhou-Quanzhou Metropolitan Area (Wang et al., 2020a). They are also expected to play an important role in the region, such as Zhuhai, considered the engine driving the development of the west coast of the Pearl River (He et al., 2021), while the economy of the mega-region is centered on the east coast (Guangzhou-Shenzhen-Hong Kong belt). The second subcategory is mainly located in north China, such as the South-central Liaoning mega-region. The core cities are not outstanding but have a narrow superiority to maintain their dominant regional roles. This lack of a strong core concerns the authorities: in spatial planning documents, “strong provincial capitals” have often been emphasized as an important development strategy (DNR Liaoning, 2021). Creating a “superstar” city in the region aims to attract more development resources, investment, and talent, and is expected to drive the surrounding secondary cities.

The development trends also show that not all cities play a strong role in regional prosperity. Clearly, the first subcategory, representing a very small part, shows positive development in innovative capacity, social vitality, and secondary industry growth (the fourth trend). However, for the second subcategory, except for the secondary cities in the Beibu Gulf, which are experiencing economic re-structuring (the first and second trends), cities in the north follow the third trend of industrial and socio-economic decline, most having been resource-based and heavy industry cities in the past. HQD initiatives challenge the traditional industries in these cities, and they face the challenge of transformation towards knowledge-intensive, less carbon-intense, and service-based economic sectors (Wang et al., 2020b).

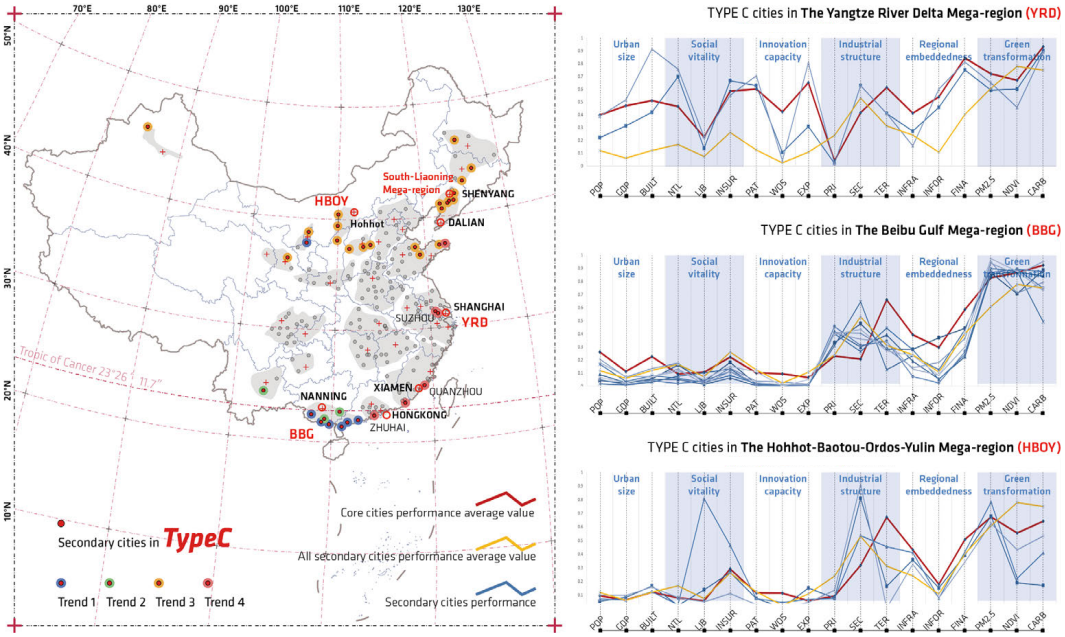

FIG. 2.8 Profile of Type C

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2.5.4 TYPE-D: Moderate followers

Type D is the cluster with the largest number of cities. We named them Moderate Followers because these secondary cities do not stand out or underperform in any specific aspect, but their core cities perform significantly better in almost all aspects. This “equalization of disparities” allows the core cities to play a dominant role in the mega-region, which has no extreme unevenness problem (Figure 2.9). Compared to other types of secondary cities, they have the smallest gap in tertiary industry ratio compared to the cores. This may be because the core cities are also less developed than other mega-regional cores in the high-end service economy, with secondary industries being their mainstay. For example, Wuhan, Changsha, and Nanchang, the cores of the Middle Yangtze River mega-region, and Zhengzhou, the core of the Central Plain mega-region, have higher secondary industry proportions than most other mega-regional cores. Looking at the development trends analysis, most cities in type D are in the first and second trends, showing that they are undergoing economic re-structuring, except for a few cities in the Northeast and Central Plains area, which show a trend of socio-economic and industrial decline. The upgrading of economic structures characterizes type D. It explains why these cities have a smaller gap to core cities in social vitality and perform well in environmental, ecological, and low-carbon aspects compared to other types, with some exploring their landscapes and cultural resources to develop tourism after decades of heavy industry-based development, such as Anyang and Luoyang (Kang et al., 2022).

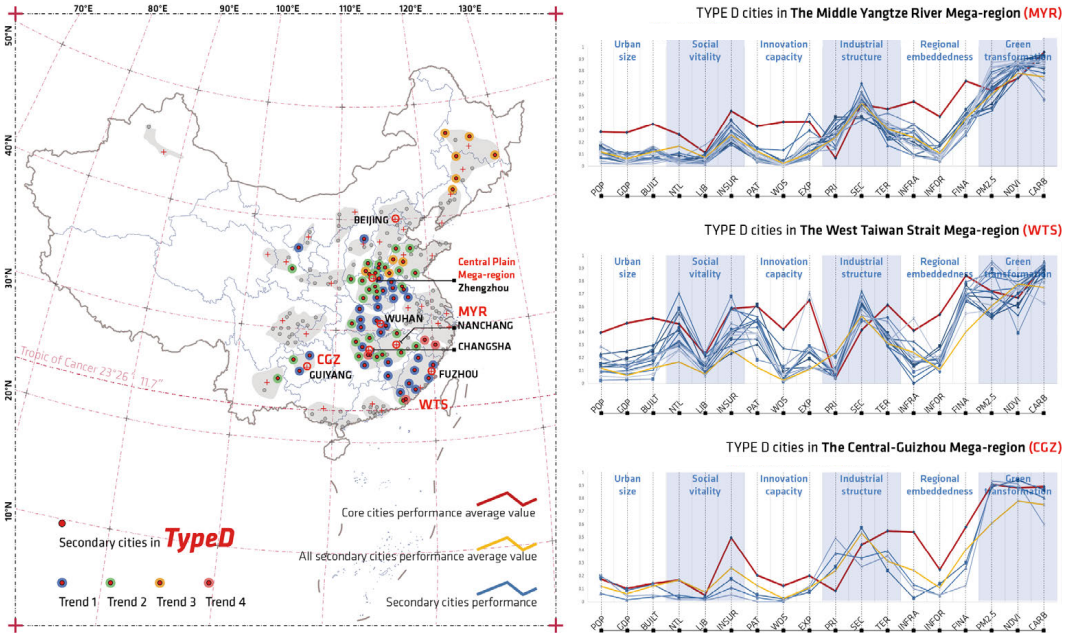

FIG. 2.9 Profile of Type D

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2.5.5 TYPE-E: Strugglers under the metropolitan shadow

Type E cities are significantly disparate from their cores in all aspects of HQD (Figure 2.10). Among the five types of secondary cities, the size gap of type E is only lower than that of type B. They also have the largest gap in innovation capacity, social vitality, and regional embeddedness. The performance gap in tertiary industrial proportion and carbon intensity are also larger than in other types, and these cities also perform poorly on the Financial Inclusion Index, a limiting factor in attracting investment and high-end enterprises (Guo et al., 2020). The results suggest that type E cities struggle in the mega-regional system. Spatially, we can see that most cities are in the Beijing-Tianjin-Hebei, Yangtze River Delta, and Pearl River Delta mega-regions, the most developed areas in China. Some are in the Guanzhong mega-region, where Xi'an, the main city of the western part of the country, leads. Struggling to benefit from these mega-regional "superstar cities" is the reason of such a disparity. For example, Zhaoqing in the Pearl River Delta is not well integrated into the emerging regional networks to benefit from social, innovation, economic, and industrial externalities (Zhang et al., 2021). In the Yangtze River Delta, type E cities are on the regional periphery, which harms their integration in terms of economic cooperation networks and knowledge and innovation networks (Sun et al., 2022).

Although the gap with the cores is not satisfactory, most cities in type E cities are transforming their economic structure, as shown in the development trends analysis. Zhongshan and Jiangmen, in the Pearl River Delta, even made significant progress in innovation capacity from 2011 to 2020. This indicates that these secondary cities are changing to adapt to the dynamic mega-regional system. However, there are four cities where the situation is worrisome: Handan, Hengshui, and Chengde in the BTH, and Tongling in the YRD belong to the third trend, meaning that their social vitality and industrial development face severe challenges.

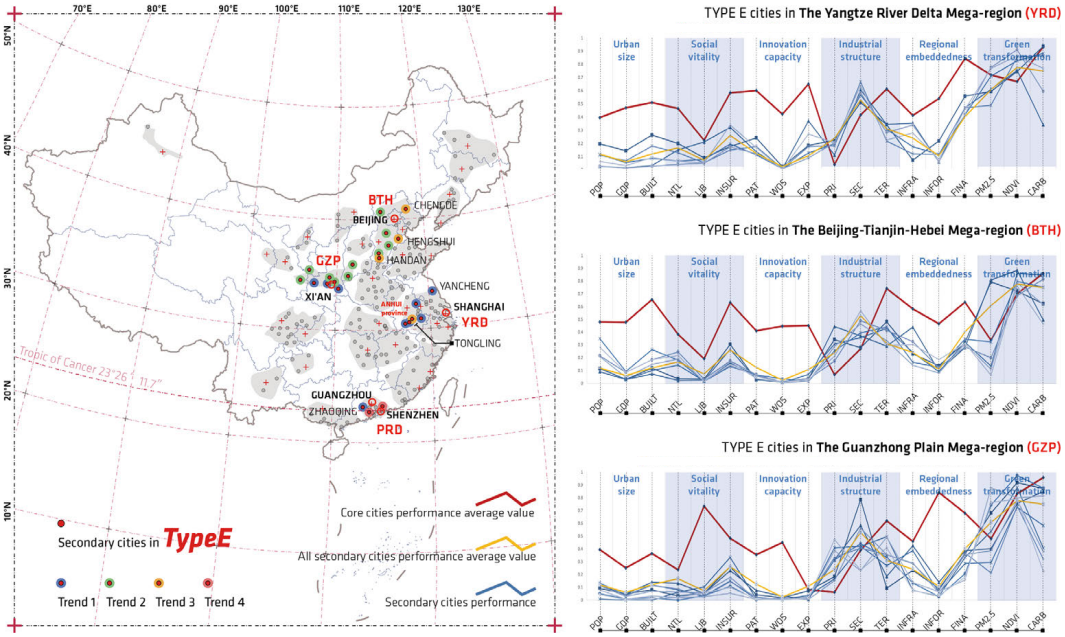

FIG. 2.10 Profile of Type E

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2.6 Discussion

Our findings demonstrate that the concept of secondary city based on comparative relations with a core city is significant in the Chinese context. While much international literature has focused on inter-city relations as an essential factor in defining such "secondness", such a discussion is rare in the Chinese context. What needs to be clarified is that these secondary cities are not the widely recognized Chinese second-tier cities, which are defined on the basis of socio-economic performance and often refer to cities ranked after the four global metropolises of Beijing, Shanghai, Guangzhou, and Shenzhen (Wang et al., 2017). This chapter focuses on mega-regional networks, where secondary city is a relational concept. This is a recognized perspective in the international literature, as Pendras and Williams (2021, 1) describe: "*By definition, the idea of 'secondary' involves a relationship, a comparison with a dominant other, […] understanding these cities – as well as their dominant neighbors – requires a relational perspective*".

Scholars have consistently argued that positive interaction with core cities and a tendency towards spatial integration in polycentric regions contribute to some extent to the socio-economic performance of the secondary cities (Mayer et al., 2021). However, because of different governance contexts, spatial scales, and socio-economic development, this may not be applicable in Chinese secondary cities. For example, borrowing size, which proposes that secondary cities rely on strong connectivity with the other nearby cities to achieve better socio-economic performance, is a common phenomenon in countries such as the Netherlands (Meijers and Burger, 2017). In Chinese mega-regions, however, the spatial scale of this process may be too large to be effective due to commuting costs and other reasons, failing to realize borrowed size, for example, at the level of regional knowledge and innovation exchange (Yang et al., 2022). Therefore, the specific research needed about the challenges faced by Chinese secondary cities in the uneven relational context of mega-regions may not overlap, but rather complement those of cities in the Global North. For that purpose, we use the previsouly defined typology to outline the specific combination of HQD challenges faced by each type of secondary city.

Type A cities are socially vital contenders in mega-regions with developed cores, such as Shanghai, Beijing, and Shenzhen. However, these cities have significant shortcomings in innovation capacity and a very high proportion of secondary industries, which may indicate their position as absorbers of industrial relocation processes of core cities aiming at sustainability described by Pendras and Dierwechter (2022) for the US case. Such over-reliance on the secondary sector,

especially in low-end activities that do not fit core cities any more, can create challenges for their own local sustainability and industrial upgrading, as seen by cities like Tangshan facing a downward development trend (Figure 2.4).

One of the challenges faced by type B cities is their low regional embeddedness, particularly informational visibility, which may be due to their small size. This gap poses challenges, e.g., reduced cultural diversity and difficulties in attracting investment. However, core cities with higher visibility also offer opportunities for smaller players to build collaborative networks and expand the regional branding benefits (Lu et al., 2020). Since these cities also perform below average in other aspects, the willingness and capacity of their cores, Chengdu and Chongqing, to support them with industrial upgrading, investment, talent, and policy will be crucial in combating intra-regional unevenness.

Type C cities have the smallest gap with their cores and can even surpass them in HQD. Indeed, developed "pioneer" secondary cities such as Suzhou and Zhuhai are in this type, and have maintained rapid progress in the mega-regional system. The challenge for most other cities in this group is that they are socio-economically declining together with the core cities. Industrial transformation is their biggest challenge, as the resource-based economic model over the past decades has led to a high degree of industrial homogenization, both in secondary cities and the cores. The development paths of post-industrial cities like Shenyang and Harbin have been widely discussed in this regard (Lu et al., 2020). The authorities, however, tend to emphasize their cores: the latest mega-regional spatial plan highlights the leading role of Shenyang and Dalian, and the intention is to concentrate new high-end industries there (DNR Liaoning, 2021).

For type D cities, the findings do not immediately reveal difficulties in the mega-regional system. As noted earlier, these "Moderate followers" are somewhat disparate from their core cities in all aspects, but these disparities are not severe compared to other secondary city types. They also have a higher proportion of tertiary industries than others, suggesting a better chance of standing out in the wave of industrial upgrading. However, the spatial structure of these mega-regions, such as the Middle Yangtze River, the Central Plain, and the West Strait mega-regions, speaks to a problem, as they encompass a wide range of territory. This limits the core city's capacity to positively interact with surrounding secondary cities, and networks of socio-economic activities have not yet been well established. This is why some scholars have argued that these mega-regions are merely "imaginary visions" and have not achieved their potential as a complex and dynamic system (Harrison and Gu, 2021). For example, the Middle Yangtze River mega-region is often considered as three sub-regions led by Wuhan, Changsha, and Nanchang rather than one region as a whole(Wang et al., 2019).

Finally, type E cities struggle with the toughest challenges. The huge gap between them and their cores in all aspects of HQD indicates their unfavorable position in the mega-regional system. The different fortunes of these cities compared to the other types suggest that the functioning of the mega-regional system is inherently a threat, including the concentration of development resources to the cores, the decrease in political attention, and the inability to adapt to the complexity of the system as it evolves. Notably, most well-performing cities in type A belong to the same mega-regions as Type E: the Yangtze River Delta, the Pearl River Delta, and the Beijing-Tianjin-Hebei. Following the findings by Meijers and Cardoso (2022) about the factors contributing to widely opposing prospects of secondary cities in the Dutch Randstad, the main differences between these two types are worth exploring.

In summary, the different secondary city types in terms of HQD performance and challenges can be interpreted as different types of uneven spatial relations between core and secondary cities. Specifically, type A and type E can be framed within relations between a “superstar” metropolis and the surrounding secondary cities in highly developed mega-regions. Such spatial relations have two-sided consequences and bring very different prospects to secondary cities. Type B represents unbalanced relations framed by a great size disparity. Type C and type D can be seen as mega-regions with less significant gaps between the core and secondary cities, but their relations are tested by, respectively, a common decline trend and the fragmentation resulting from excessive spatial distance.

2.7 Conclusion

This chapter delivers the first typological classification of secondary cities in Chinese mega-regions based on an HQD evaluation framework and K-means cluster analysis. Our results depict the characteristics of five types of secondary cities in six dimensions: urban size, social vitality, innovation capacity, industrial structure, regional embeddedness, and green transformation. By doing so, the chapter fills the research gap of insufficient knowledge of mega-regional unevenness and the challenges faced by secondary cities moving towards HQD.

The results are significant for more targeted approaches to secondary cities towards HQD, especially regarding policy recommendations. On one hand, the typological study brings a new methodological perspective on policy formulation. Traditionally, policy formulation has often been based on territorial boundaries: a province or a mega-region as defined in spatial plans. We believe that formulating policies based on different types of cities sharing previously undetected similarities across various indicators allows both the cities and higher-level governments to share best practices and lessons and improves the effectiveness of the policies. The approach can, therefore, promote cooperation between cities of the same type and encourage complementary relations between different types of cities to alleviate the unevenness of HQD trajectories in mega-regional systems. In addition, summarizing the characteristics and challenges of secondary cities based on their HQD performance provides a foundation for formulating targeted policies and spatial planning adjustments. For example, for type A cities, emphasis should be placed on improving innovation capacity and transforming secondary industries to avoid over-reliance on a single economic sector. For type B cities, regional policies should coordinate their spatial relations with core cities to avoid demographic, industrial, and investment polarization and further loss of political voice due to their small size. For type C, mega-regions facing the challenge of common decline, the development paths of core and secondary cities should be considered in a coordinated way, rather than focusing only on the revival of the core city. For type D, the spatial and governance scope of the mega-region needs to be calibrated with the ability of the core city to support the surrounding secondary cities. For type E, the key policy question is how these cities can navigate under the shadow of the metropolis to avoid excessive polarization.

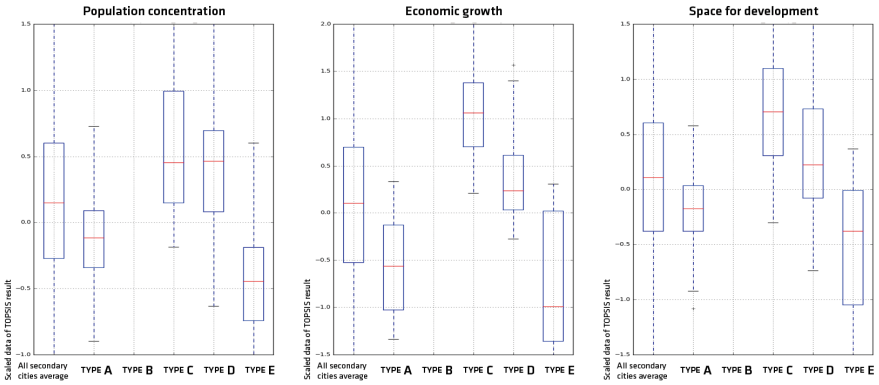
This study also contributes to global research of secondary cities. On one hand, we show that the concept of "secondary city" based on inter-city relations also has the potential describe regional uneven development in China. This extends the policy implications of dealing with "secondness": different spatial and governance contexts, core city types and dimensions of unevenness tend to generate analogous processes that lead cities into widely different trajectories, many of which implicate a 'metropolitan shadow' and weaker economic performance, fewer amenities and lower quality of life than expected in cities well connected to powerful cores (Meijers and Burger, 2022). This is in line with what we define here as the problems of polarization and peripheralization of Chinese secondary cities.

Therefore, determining the typology of Chinese secondary cities expands the possibilities for global academic and policy exchange and cooperation, and provides additional references for planning policy formulation for secondary cities. Methodologically, using cluster analysis based on relational aspects between core and secondary cities to create a typology is not commonly applied in the international literature and we expect that this approach can play a broader role in other contexts to enrich the understanding of secondary cities.

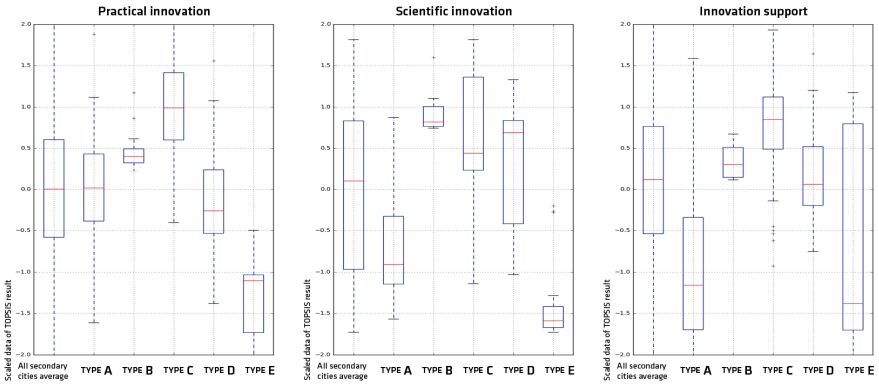
Finally, there are also some limitations of this chapter. Although we trust the validity of this typology, secondary cities are unique due to their different cultural identity, resource endowments, regional environments, and related local policies. Moreover, the data presented in this chapter only paints a broad picture of the different types of secondary cities, and the realistic challenges they face cannot be demonstrated. This is the limitation of our study. However, the chapter provides a meaningful foundation and support for future research to respond to these limitations. More detailed empirical research and case studies are necessary, including more elaborate evaluations of the performance of different types of secondary cities based on specific development dimensions; investigations of HQD mechanisms, pathways, and effectiveness based on specific types of secondary cities; and studies of the implementation impacts and coping strategies of different types of secondary cities under specific policy perspectives.

Appendix

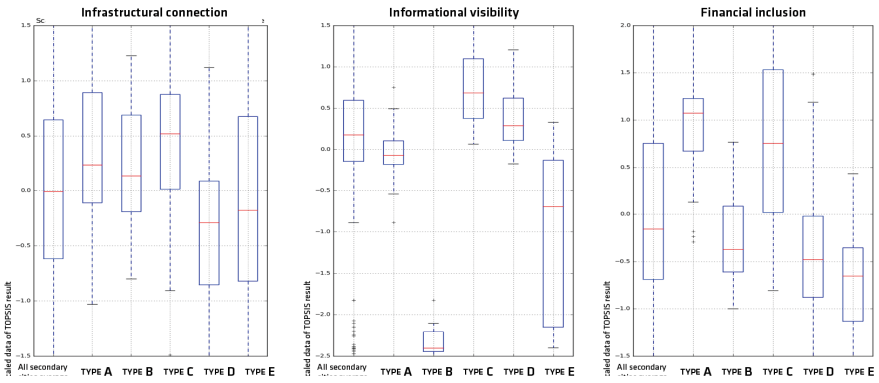
Urban size



Innovation capacity



Regional embeddedness



Boxplots analysis for comparing different types of secondary cities

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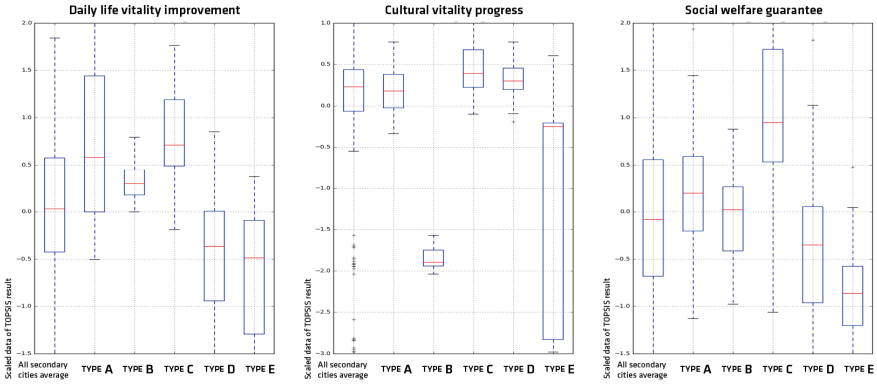
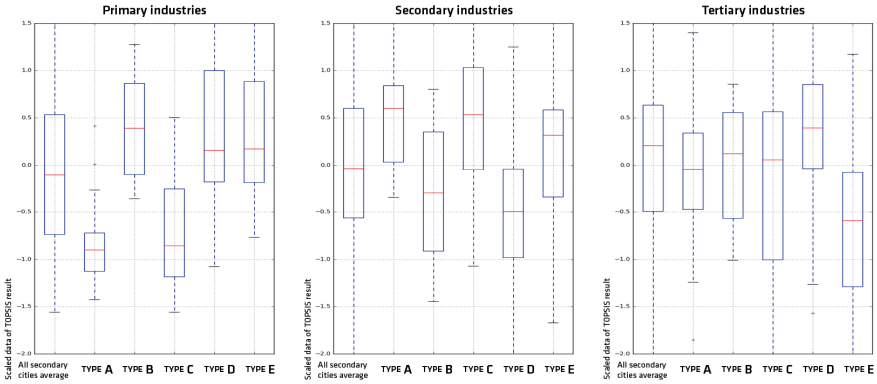
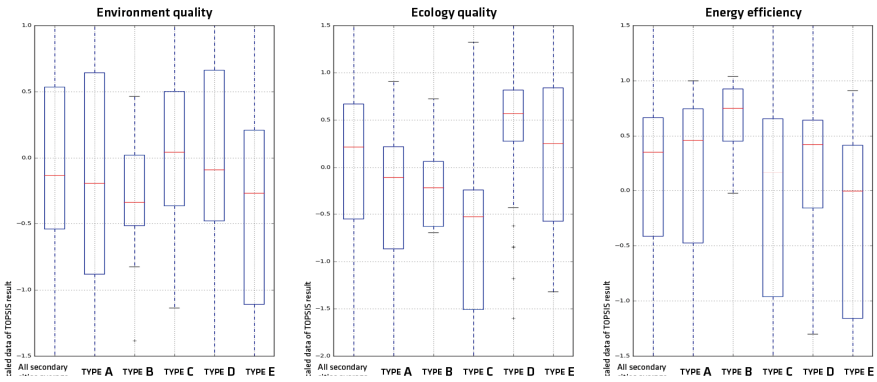
Social vitality



Industrial structure



Green transformation



Boxplots analysis for comparing different types of secondary cities

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Secondary cities are expected to play multiple roles within regional systems: livable cities with strong social vitality, economically dynamic cities that offer employment opportunities, and environmentally attractive cities suited for leisure and tourism.

The nighttime cityscape of a newly developed area in Handan, photographed by Kaixuan Wen.

3 Towards coordination of spatial relations

Conceptualizing Chinese mega-regionalization from a secondary city perspective

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ABSTRACT Mega-regional planning in China is expected to tackle intra-regional unevenness, namely the development gap between regional core cities and the surrounding secondary cities. However, mega-regionalization processes seem to further increase the centrality of cores and push secondary cities towards greater polarization and peripheralization. To reflect on why mega-regions are not fulfilling their role of rebalancing regional urban systems, we conceptualize mega-regionalization as a mechanism to coordinate spatial relations within a territory and build a novel framework to analyze the relations between core and secondary cities. First, we identify the visions of mega-regional planning regarding core-secondary relations. Then, we use thematic analysis to evaluate the policy orientations of mega-regional planning to achieve these goals and extract three policy themes governing core-secondary spatial relations. Emphasizing spatial relations to conceptualize mega-regional governance allows a novel reflection on the challenges of unevenness grounded in the perspective of secondary cities. This deepens our understanding of governance mismatches that keep ideal visions and policy orientations misaligned when seen from secondary cities. Place, priority, and actor mismatches limit the potential of mega-regionalization to respond to their challenges.
This chapter provides a relational understanding of mega-regions, calling for more attention to secondary cities, supporting the following research as a conceptual framework.

KEYWORDS Intra-regional unevenness; Chinese mega-regions; Secondary cities; Core-secondary spatial relations; Policy analysis.

3.1 Introduction

Since the Reform and opening up of China in 1978, national economic development has primarily followed the growth pole pattern: the central government fostered some well-positioned cities on the southeastern coast to pioneer economic prosperity and drove the development of latecomers (Li & Wei, 2010). As a result, inter-regional unevenness in China has become increasingly pronounced along with marketization, economic decentralization, and globalization since the 1990s (Wei, 2001). Facing such challenges, the authorities encouraged a broader dissemination of the growth pole pattern. Since 2005, the authorities have introduced the concept of national core cities, and in the National Urban System Plan (2006–2020) published in 2010, Beijing, Tianjin, Shanghai, and Guangzhou were designated as the top of that hierarchy (Hamnett et al., 2023). Subsequently, the list of national core cities was expanded to take into account inter-regional unevenness. In 2016, Chongqing and Chengdu were selected as new national core cities to support the development of Western China in the Development plan for Chengdu-Chongqing mega-region (CNDRC & MHURD, 2016), while Zhengzhou and Wuhan became the driving forces of Central China, followed in 2022 by Shenyang's visionary plan of being another national core city in Northeastern China (Hamnett et al., 2023). At the provincial level, cultivating regional "superstar" cities to enhance competitiveness and visibility became an important development goal (Ke, 2010).

Although this approach effectively alleviated inter-regional unevenness and encouraged development in central and western China (Fan & Sun, 2008; Liao & Wei, 2016), another problem arose: *intra-regional unevenness*, namely the increasing development gap between regional core cities and other smaller cities in the same region. We identify such non-core cities as regional secondary cities. They generally do not play a leading role in regional development due to poor public financing, peripheral location, and diverted policy priorities. Intra-regional unevenness affects regional sustainability because core cities face enormous development pressures, overcrowding, and environmental degradation (Yang et al., 2017; Zhang et al., 2019), while secondary cities risk economic shrinkage and social vitality decline (He et al., 2017). To cope with this problem, the authorities pinned their hopes on "regional coordination" in the Twelfth Five-Year Plan (2011–

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2015). In this national development document, cities of different sizes and types within the regional system are expected to interact optimally. This meant a shift in focus from large cities to the role of small and medium-sized cities (CNDRC, 2011) towards a more balanced regional system based on the division of labor and inter-city cooperation (Luo & Shen, 2009). This has been highlighted repeatedly over the past decade, and a concept emerged as a main spatial carrier for the coordination process: the mega-region, which usually consists of strongly interacting networks of one or two dominant core cities and a series of smaller secondary cities (Yeh & Chen, 2020).

The mega-region is not a new concept in international research. Scholars have discussed "global city-regions" and "mega city-regions" as a dynamic scale between country and city for socioeconomic development (Douglass, 2000; Sassen, 2001). Core cities and their surrounding smaller cities and hinterlands are treated as a closely interconnected network where beneficial network externalities and inter-city cooperation are expected (Florida et al., 2008). Therefore, flows and interactions between cities become an important focus of political and scientific concern. In China, the concept of mega-region largely follows this logic (Yeh & Chen, 2020).

However, there is a fundamental difference compared to the international context. In the global north, mega-regions are often used as an analytical concept, as cities are highly interconnected through infrastructure and flows, and complex regional networks have already emerged. In China, mega-regions tend to be considered an "imaginary planning concept" (Harrison & Gu, 2021), as in most cases, not all cities are well integrated. Only a few mega-regions, such as the Pearl River Delta, can be considered as real and highly integrated systems, while the rest are either in the developing or planning imagination stage. Instead, this aspirational concept looks at future trends and guides planning decisions, becoming a governance tool through which the authorities control the spatial agglomeration of cities, strengthen infrastructure connections, and optimize industrial (re-) distribution. Overall, the Chinese mega-region is a vision that has yet to be realized.

Although scholars have different understandings of mega-regions and debate them from the perspectives of national spatial governance (Li et al., 2022; Li & Wu, 2012), land use dynamics (Yu et al., 2019), and regional networks (He et al., 2023), two mega-regional competencies are typically recognized in rebalancing Chinese intra-regional development. First, they aim to create an integrated regional framework in which all cities are expected to be closely interconnected towards functional complementarity and agglomeration benefits. Second, they entail a centralized coordination approach that addresses regional risks and crises, especially zero-sum competition among cities and environmental challenges (Fang & Yu, 2017; Li et

al., 2022; Li & Wu, 2012). Both competencies can help secondary cities overcome intra-regional unevenness: regional integration emphasizes efficient and mutually valuable inter-city connections, including the diffusion of knowledge and innovation, labor and talent mobility, large-scale project cooperation, and technological and financial support. Centralized coordination relies on regional planning and policy interventions, which can help secondary cities take more responsibility for regional development.

However, mega-regions do not necessarily benefit secondary cities: in most cases, their social, economic and industrial vitality is still declining and the gap to core cities is still significant (Yang et al., 2021; Yu et al., 2018). Two problems are exacerbated in this process: polarization and peripheralization. On one hand, despite the opening up of markets, the spread of infrastructure, and urban expansion enabling closer connections, the cores keep an exceedingly large socioeconomic pull (Cao et al., 2023). This results in polarization as development resources, including talent, investment, and labor, are drained away from secondary cities (Wei et al., 2020). For example, the expected integration driven by expanding the regional high-speed railway actually speeds up flows towards core cities instead of rebalancing them across secondary cities (Huang & Zong, 2021; Liu et al., 2020). On the other hand, as engines of economic growth, there is often a policy focus on core cities by regional authorities. Consequently, secondary cities are not policy priorities and lose political voice in the regional system (Li & Jonas, 2023), leading to peripheralization. For example, growing the cores into dominant "superstar cities" in economic networks requires forming stronger alliances with surrounding towns and hinterlands in pursuit of space for growth (Jaros, 2016). But this process reinforces the political and economic centrality of core cities and, conversely, exacerbates the peripherality of secondary cities.

This research argues that focusing on the spatial relations between core and secondary cities is relevant to further exploring this intra-regional unevenness, namely polarization and peripheralization challenges. We define spatial relations as the intensity of spatial interactions, the establishment of spatial connections, and the governance of spatial planning actions between core cities and their surrounding secondary cities in the process of mega-regionalization. The research question is, therefore, to what extent the coordination of core-secondary spatial relations can either reduce or exacerbate the problems of polarization and peripheralization of secondary cities in mega-regions.

On this basis, we aim to understand spatial relations from three perspectives to answer the research question: **what are the policy orientations of mega-regional coordination for secondary cities initiated by national authorities and what governance mismatches, at the theoretical level, prevent their materialization?**

- First, we investigate ideal visions, namely what kind of coordinated spatial relations between core and secondary cities are envisioned in mega-regionalization processes to cope with polarization and peripheralization.
- Second, we analyze policy orientations. As a regional governance tool mainly driven by planning policy (Harrison & Gu, 2021), Chinese mega-regional policies directly affect the materialization of the visions and determine their effectiveness in addressing the secondary cities' challenges.
- Third, we discuss the real-world mismatches, namely the potential threats and policy obstacles that may prevent ideal visions from being realized.

The findings contribute to a new perspective on the impact of mega-regionalization on secondary cities. Reconceptualizing Chinese mega-regionalization through the lens of core-secondary spatial relations helps understand how planning visions and mega-regional governance approaches respond to intra-regional unevenness. The research sheds light on the roles of secondary cities in such systems to highlight the importance and potential of these smaller players in contributing to coordinated spatial relations. Finally, discussing the mismatches between visions and policy orientations provides a wake-up call for planners, policymakers, and implementers to address the exacerbated unevenness in Chinese mega-regions and a conceptual framework to explore future research on secondary cities.

3.2 Mega-regions as arenas to develop and coordinate spatial relations

3.2.1 Challenges of secondary cities

We represent regional unevenness by the development gap between two types of cities, not only in terms of population and economy, but also emphasizing the multiple functions of cities and the value they bring to the regional system. In that sense, the role of the "core" is significant in defining "secondary cities". The concept of mega-regions, especially from the perspective of economic globalization, is inherently accompanied by the image of a strong core city that integrates with its surroundings to provide wider and cheaper space for investment attraction (Florida et al., 2008). This process is often followed by regional functional repositioning, as the cores acquire advanced financial, innovation and control roles that further empower them to grow into global economic hubs (Morshed et al., 2022). Similarly, in China, mega-regions are also recognized as spatial units for the (industrial) expansion of core cities and the transfer and redistribution of economic sectors (Yeh & Chen, 2020). Until 2018, a total of nine cities had been identified as such national core cities in different geographic areas (Hamnett et al., 2023). At the mega-regional scale, these cities are also explicitly designated in official planning documents. In addition to the national core cities, provincial capitals and sub-provincial cities are also often considered mega-regional cores for their large size, economic strength, and political power.

The challenge of unevenness suffered by secondary cities in mega-regional systems has been confirmed at several dimensions. Previous studies have explored it from the perspective of disparities in endowments of cities by evaluating their innovation capacity, economic potential, and spatial quality (Ren et al., 2020; Wang et al., 2021). Additionally, flows in regional networks are increasingly becoming the focus, including demography, transportation, knowledge, and cooperation (Scherngell & Hu, 2011; Sun, 2016; Wei et al., 2018), confirming that secondary cities suffer the negative effects of polarization as unidirectional flows reinforce the dominance of core cities. Regional planning initiatives and governance implementation have also contributed with insights, including the impact of environmental regulations on the industrial transformation in secondary cities (Kuai et al., 2015), the unrealistic expectation on the effect of high-speed rail systems

on the sustainable development of secondary cities (Song et al., 2022), and land use efficiency disparities among cities due to uneven governance capacities (Jiao et al., 2020; Yu et al., 2019).

3.2.2 Poison or panacea: mega-regional responses to unevenness

Indeed, mega-regionalism has been blamed for unevenness, but has also been recognized as a panacea for the problem. As mentioned above, "regions" are promoted in various political and social contexts worldwide because they are often defined as engines of growth (John et al., 2005; Morshed et al., 2022), but within them contrasts of centrality and peripherality still appear. Although Sassen (2001) mentions that the paradigm of centrality is changing from the traditional scale of a few blocks of a central business district to entire metropolitan areas, strong, albeit upscaled, agglomeration shadows persist between cores hosting advanced functions and emptied out peripheral locations (Pendras & Williams, 2021; Burger et al., 2015). In Europe, for instance, as economic priorities take precedence and centralized governance is weakened, competitive models of regional development prevail over distributive ones, leading to even more unfavorable contexts for secondary cities (Beel & Jones, 2021; Cardoso, 2023; O'Brien & Pike, 2015).

In China, however, as mega-regions become a fundamental scale of inter-city relations, regional governance, and growth (Harrison & Gu, 2021; Li et al., 2022; Yeh & Chen, 2020), a growing number of scholars refer to them as a panacea for the unevenness between core and secondary cities. First, mega-regions are envisioned as polycentric networks of efficient, balanced, and multidimensional interacting activities (Liu et al., 2016). This appreciation of the polycentric model stems from a twofold discussion. On one hand, it implies regional integration, as individual cities are closely linked through multiple spatial flows to form a better-performing network (Meijers et al., 2018), triggering an increase in socio-economic vitality through sharing, learning, and matching. On the other hand, the system emphasizes the balance of importance among cities (Burger & Meijers, 2012; Liu et al., 2016), as integration implies interdependence and complementarity, and is also valued in this system (Meijers, 2005). This means that different cities play specialized roles to enhance the performance and effectiveness of the region as a whole.

In Chinese mega-regions, this has been repeatedly written into planning policies as "development direction", "functional positioning", and "building on one's own strengths" to encourage the spatial integration of secondary cities in a polycentric system. This comes with another perspective that values the recentralized

governance capacity of mega-region in dealing with the aforementioned problems of excessive inter-city competition, over-marketized development paths, or short-sighted visions of growth. Typical points of attention tend to be the local assets of such cities and the support from higher-level governments through financial, regulatory, or technological development policies, such as industrial relocation strategies (Tian et al., 2019). Furthermore, inter-city connections, namely flows of knowledge, cooperation, and migration, have been studied based on the notion that the functioning of a mega-region relies on such networks materializing spatial connections between its elements (Wang et al., 2023).

3.2.3 Spatial relations between core and secondary cities

Despite revealing the dynamics of intra-regional centrality and peripherality to some extent, existing studies either consider mega-regions as a whole and do not target the specificity of secondary cities, or focus on individual secondary cities, ignoring their relational context, specifically with the core. In response, based on the previously discussed problems of polarization and peripheralization, we argue that focusing on the spatial relations between core and secondary cities is a relevant lens to understand how the latter navigate mega-regionalization, as it allows us to approach the discussion from two dimensions. First, by materializing core-secondary spatial relations, we mean directly uncovering key drivers of intra-regional unevenness: disparities in city size and attractiveness, imbalanced distribution of urban functions, and polarization of spatial flows. On the other hand, if coordinating these complex relations is an essential governance task for rebalancing mega-regional systems and a critical agenda of Chinese mega-regionalization, then this perspective helps rethink why the polarization and peripheralization of secondary cities remain unresolved under mega-regional governance.

Through this lens, Chinese mega-regionalization can be understood as a governance process that stimulates the transformation of inter-city relations through strategic interventions aimed at spatial coordination. Since mega-regions are highly networked and interdependent systems, efficient and complementary spatial relations among their constituent elements–its cities–are essential to their functioning. As demonstrated in development policies and spatial planning documents, Chinese authorities encourage beneficial interaction between cities through various planning interventions at functional, infrastructural, and morphological levels. In 2005, the central government produced the first strategic spatial plan of mega-regions, indicating the upscaling of Chinese planning towards regional governance aimed at coordination among cities (Li and Wu, 2012, 2013).

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Although there is no explicit statement that recentralized regional governance aims to reshape core-secondary spatial relations, a growing body of literature discusses the role of mega-regionalization in rebalancing them. This includes, for example, the intensification of flows based on infrastructure extension (Sun et al., 2023; Wang et al., 2019), the promotion of inter-city cooperation in various fields of innovation, industrial transformation, and environment management (Lu & Huang, 2012; Sun et al., 2022), and the establishment of inter-city integration axes based on the implementation of regional planning initiatives (Huang et al., 2023; Ramondetti, 2023). This is a reform of the regional growth model in China: the downsides of self-reliant development and competition among cities stimulated by the market economy are acknowledged, and a model of regional integration based on inter-city alliances is preferred. In this way, a fundamental transformation of Chinese mega-regions occurs, from a hierarchical, inter-city competition-oriented "group of cities" to a relational emphasis on spatial coordination and cooperation in a "system of cities". To summarize, mega-regionalization in China takes the coordination of spatial relations between core and secondary cities as a governance approach to potentially respond to the latter's challenges of polarization and peripheralization.

3.3 Research design

We analyze spatial relations in three steps to gain a better understanding of the position of secondary cities in Chinese mega-regionalization, namely ideal visions, policy orientations, and governance mismatches. First, we deconstruct the ideal visions of mega-regions in relation to polarization and peripheralization in secondary cities, departing from morphological, functional, and connectivity components (Burger et al., 2014). Second, we employ thematic analysis to unpack Chinese mega-regional policies and explore what kind of policy orientations enable the creation, enhancement and governance of core-secondary spatial relations to support the realization of these visions. Third, we discuss why these policy orientations are ineffective in tackling the factors behind the exacerbation of polarization and peripheralization. We conceptualize these factors as governance mismatches, i.e. obstacles that prevent governance decisions and actions from being as effective as expected. Relevant theories and concepts underpin our discussion in the context of the practical difficulties faced by secondary cities, also grounded in existing cases and relevant secondary data.

3.3.1 Sources and materials

The Fourteenth Five-Year Plan (2021–2025) clarified the goals of mega-regions in terms of integrated development, infrastructure distribution, division of labor in industrial upgrading, public service sharing, and spatial structure optimization (CNDRC, 2021). Based on this, 19 mega-regions were redefined as fundamental spatial units for future sustainable urbanization, all of which are considered here (Figure 1.4). The primary research materials are the development planning documents of each mega-region, generally promulgated by the National Development and Reform Commission (NDRC) or provincial governments. This is because, first, Chinese mega-regionalization is a recentralized governance process (Wu, 2016), with spatial planning and policy as the authoritative driving force. Interpretation of these policy documents clarifies the expected position of secondary cities in such emerging regional systems. Additionally, these policies issued by higher-level governments often serve as guiding principles for localized planning actions in individual mega-regions and cities, thereby allowing the subsequent study of specific strategies and implementation. Other planning policies are used as supplementary materials, including policy documents and spatial plans responding to specific mega-regional issues, such as industrial transformation and environmental restoration, and some plans by individual cities.

3.3.2 Thematic analysis

Since Braun and Clarke (2006) clarified specific techniques of thematic analysis, this social research method has been widely used in content investigation. In urban and regional research, such a method is effective in addressing a wide variety of questions and data types, including literature reviews (Ataman & Tuncer, 2022), news and media texts (Huang & Loo, 2023), and semi-structured interviews (Alyavina et al., 2020). Thematic analysis is based on a holistic and thoughtful understanding of the context and data, while being more open than other text analysis methods, leaving sufficient room for discussion and critique.

In this chapter, this method is used to extract the policy orientations of mega-regional policies regarding the response to problems and realization of visions in secondary cities. First, the fragmented policy texts can be systematically categorized into different themes to provide an understanding of the roles of secondary cities in mega-regionalization and deconstruct the discourse priorities and specific policies. Second, the thematic connection between different mega-regional documents facilitates the answer to the question of which policy orientations does mega-regionalization adopt in realizing which visions. Here, the thematized policy orientations are extracted

as “intermediary pathways”, offering a foundation for further evaluation of policy effectiveness, implementation of actions, and exploration of obstacles. Finally, the openness of thematic analysis allows us to retain space for critical thinking about these policy documents: instead of following a strictly theoretical framework, we allow our findings to be open-ended, as the extracted themes are not rigidly defined or closely bound to a particular theoretical perspective. Thematic analysis is an evolving conceptual framework with the potential for further refinement and deduction in more empirical studies, as well as a window for optimization of current policies.

While valuing the openness of the thematic analysis method, we designed a detailed methodological path to ensure the reliability of findings (Figure 3.1). We develop the technical details based on the specific steps by (Braun & Clarke, 2006) and borrow the coding principles of **grounded theory** (Eaves, 2001), with two preconditions. First, although a growing number of studies have attempted artificial intelligence approaches to cope with large-scale textual data interpretation, given the immaturity of the relevant tools for regional policy research in China, the process of coding and extracting the relevant themes in this chapter is completely manual. In total, we reviewed 21 policy documents with more than 400,000 Chinese characters (see Appendix). Second, we expect that themes (or sub-themes) emerge that are not necessarily enacted in secondary cities. Therefore, data selection based on certain rules is necessary and only policy text fragments that meet certain criteria are coded to extract relevant themes.

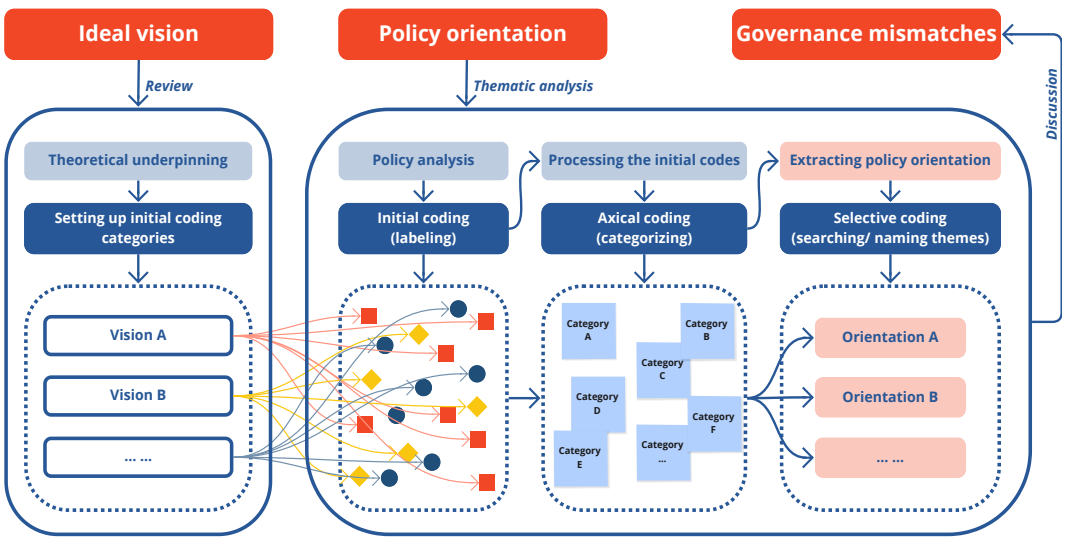

FIG. 3.1 Research methods

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Based on this, the first step is to define the coding rules within the ideal visions framework. Ideal visions show the expected directions of spatial relations in mega-regionalization, therefore, texts that refer to envisioned spatial relations are coded. The initial coding is similar to "open coding" in grounded theory for the purpose of initial data cleaning and labeling. To develop a more systematic framework, we retain the second coding step of grounded theory (in conventional thematic analysis, this step is often skipped): axial coding to further re-organize the initial codes based on potential connections between them, and categorize them with similar meanings, purposes, or measures. Finally, we extract and name the policy themes. The process is conducted in Chinese to ensure continuity of coding and theme extracting, and translated into English in the last stage. Overall, this is an inductive process that searches, extracts, and names themes from fragmented policy texts using **Atlas.ti**, a platform that also provides tools to view the distribution and connections among codes and themes.

3.4 The ideal visions of core-secondary spatial relations

Although Chinese scholars have discussed spatial relations and their implications from multiple dimensions, systematic conceptual frameworks are rare. Burger et al. (2014) provide a guideline by conceptualizing these complex inter-city spatial relations as two models based on regional morphologies, configurations, linkages, externalities, interactions, and functional specializations: the Network System and the Hierarchical System. We adapt this framework with two new layers of thinking: first, we consider the specific Chinese context of mega-regionalization, which includes recentralized regional governance and the goal of coordinated and balanced regional development. Second, we consider the characteristics of mega-regional secondary cities, such as development gaps with core cities and weak political voices. On this basis, we summarize the focus of the mega-regional visions of core-secondary spatial relations: morphological polycentricity, flow multi-directionality, and functional complementarity (Figure 3.2).

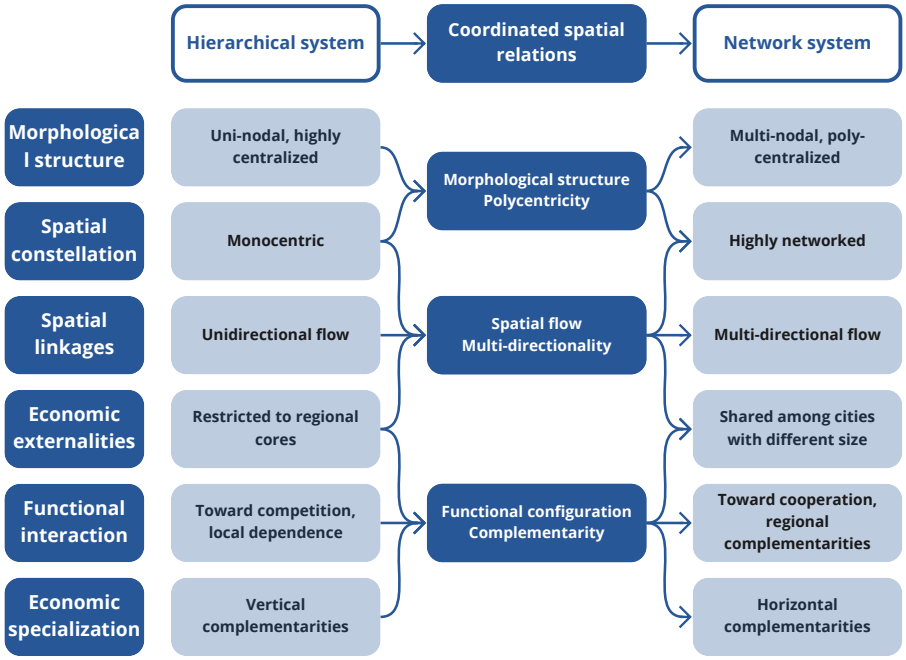

FIG. 3.2 The ideal vision of spatial relations in the Chinese mega-regional system *based on (Burger et al., 2014)*

3.4.1 Morphological polycentricity

Morphological relations examine the spatial structure of the mega-regional systems. Monocentric patterns are commonly found in the hierarchical model, which, in the Chinese mega-regional system, means the dominant centrality of the core city accompanied by a significant development gap to its neighboring secondary cities. The intensification of centrality has led to more prominent monocentric patterns in the Chinese context. For example, in the Wuhan metropolitan area, the core city of Wuhan keeps rapidly expanding compared to secondary cities (Cheng, 2022). City size, including population, economy, and other functional attributes, tends to affect regional unevenness, as more massive urban centers exert a gravity effect over their surrounding areas, sometimes called an agglomeration shadow (Zhen et al., 2023). In response, the authorities emphasize the benefits of polycentric regional networks in their planning policies and try to limit the expansion of core cities by transferring the development focus to non-core urban areas (Jaros, 2016; Zhao et al., 2017). Therefore, morphological polycentricity refers to such size and importance contrasts

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between core and secondary cities and how they change over time and/or through mega-regional planning interventions. Morphological relations are often the spatial skeleton of planning policies, and planners are keen to create axes in various directions, and urban clusters with various scales and functional orientations.

3.4.2 Flow multi-directionality

Flows between core and secondary cities help define their spatial relations. Flows often make visible the problem of regional polarization: highly centralized morphological structures trigger unidirectional flows, making core cities face an over-concentration of development factors such as housing shortages and environmental pressures (Liang et al., 2010; Tian et al., 2020), while labor shortages and shrinkage challenge the sustainability of secondary cities (He et al., 2017). Current research on inter-city flows provides evidence of regional unevenness from multiple perspectives, including transportation, migration, and material flows, as well as information, innovation, and technology exchanges (Dai et al., 2023; Lin et al., 2021). Although inter-city flows may carry positive economic externalities, as exemplified by sharing regional public service facilities and urban amenities (Meijers & Burger, 2017), Chinese mega-regionalization tends to exacerbate unevenness due to the over-centralization of development resources. Faced with such problems, the authorities expect the core cities to decentralize, relieving development pressures through, for example, the redistribution of urban functions (Li et al., 2019). This is evident in the Beijing-Tianjin-Hebei mega-region, where many Beijing enterprises, research institutes, and social service facilities are gradually relocated to the surrounding secondary cities, following official planning policies (DNR Hebei, 2021). In parallel, the secondary cities hope to attract more consumption and visibility by developing local tourism or providing preferential policies in employment or housing (DNR Hebei, 2021).

3.4.3 Functional complementarity

Functional complementarity embraces themes widely discussed in mega-regional systems: competition and cooperation, complementarity, and shared externalities of urban functions. The intensified inter-city economic competition since the 1990s has resulted in urban development homogeneity and redundancy (Yeh & Chen, 2020). This led to a wide gap in economic competitiveness between core and secondary cities as the industrial upgrading in the former is supported by their advanced financial, technical, and innovation resources. As explained by Burger et al.

(2014), in a hierarchical regional model, the core city aggregates functions with high profitability and efficiency (conceptualized as “vertical complementarity”). Networked regions rather rely on “horizontal complementarity”, in which the importance of cities does not (only) depend on size but on functional positioning. This means that a regional division of labor can give cities more specialized functions and contribute to a balanced regional system, and economic externalities are enhanced by collaborative functional relations, with cities playing different roles in the regional system and increasing their potential importance in the regional network. This encourages the distinctiveness of secondary cities in the mega-regional system. For example, the emergence of local cultural industries has given some cities greater social vitality and economic opportunities (Liang & Wang, 2020).

3.5 Coordinating spatial relations in mega-regional planning

The deconstruction of the vision of coordinated spatial relations into three aspects illustrated previously becomes a lens to explore the orientation of mega-regional policies. This section discusses whether and how such policy orientations in official planning documents promote morphological polycentricity, flow multi-directionality, and functional complementarity between core and secondary cities. Based on the thematic analysis method, we extracted 1199 planning items from 21 official documents related to 19 mega-regions. We thematically coded these items 1578 times, of which 496 codes orientate towards morphological polycentricity, 484 codes towards flow multi-directionality, and 598 codes towards functional complementarity. This allows us to categorize the strategic policy interventions addressing the three components of spatial relations into three core themes: **coexistence**, **connectivity**, and **cooperation**. It is because of the emphasis on these themes in almost all planning policies and the enactment of the corresponding strategic interventions that the challenges of secondary cities have a chance to be addressed. The following subsections introduce specific interventions related to these themes and their impact on secondary cities.

3.5.1 Coexistence

Regional coexistence emphasizes the interdependent fortunes of cities in the mega-regional system by setting certain principles and guidelines to prevent the development of some cities at the expense of others. From a socioeconomic development perspective, an appropriate division of responsibilities and roles among cities prevents excessive inter-city competition. From a territorial-environmental perspective, cities in the mega-region face common crises and challenges, such as ecological degradation, climate change, pollution, and energy crisis. This forces them to establish coexistence relations to tackle these risks jointly. According to the codes extracted, coexistence can be deconstructed into 4 sub-themes, namely: COE-1: Restructuring regional spatial patterns; COE-2: Repositioning functional roles; COE-3: Managing environmental pollution and hazards; and COE-4: Responding to energy and natural resource crises (Figure 3.3).

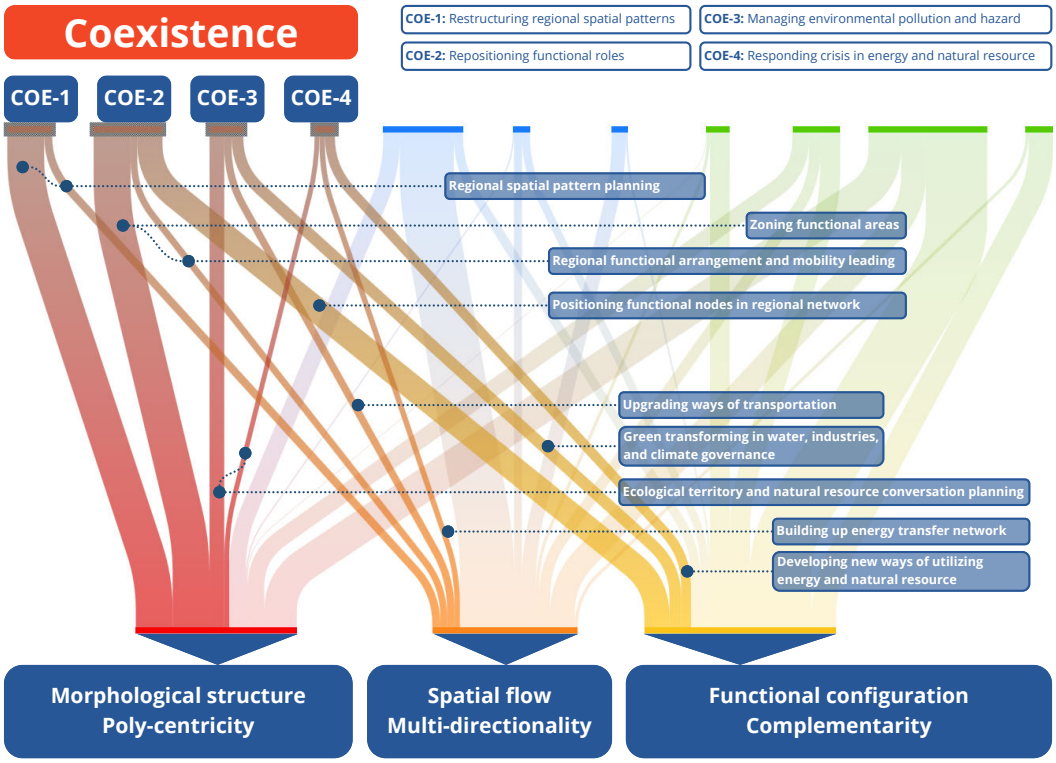

FIG. 3.3 Deconstructing the policy orientation of Coexistence

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Restructuring regional spatial patterns

Regional planning provides guidelines for the spatial arrangement of each mega-regional system. It determines the future direction of urban expansion, and the role different cities play in the regional network. We find that the leading role of regional core cities is highlighted in all mega-regional planning documents. Besides envisioning their capacity to accommodate population, investment, industry, and services, metropolization is employed as an urbanization strategy by almost all regional core cities with two-fold consequences. On one hand, they remain engines of economic growth, aiming to improve the region's industrial competitiveness, brand visibility, and attractiveness for talent and investment, which is particularly valued by core cities in less developed mega-regions. On the other hand, since this also increases the unevenness between core and secondary cities, the plans make numerous references to the value of non-core cities in the mega-region. For example, creating economic sub-centers has emerged as a critical tool to drive the growth of lagging areas. Yuxi and three other secondary cities have been designated sub-centers of the Central-Yunnan mega-region to facilitate the development of the living environment, cultural industries, and educational services. Furthermore, spatial linkages between cities are used to build up the spatial skeleton of mega-regions and are conceptualized as "axes", "corridors", and "networks". This provides a structural foundation for functional redistribution and zoning, division of labor, relocating industries and population, and infrastructure extension, across cities of different sizes. In this system, secondary cities (especially their centers) are envisioned as drivers of further urbanization and population agglomeration, providing the surrounding rural areas with better living conditions and services.

Repositioning functional roles

The functional arrangement of mega-regions is based on the characteristics and strengths of the different cities, aiming to create a complementary and efficient regional growth strategy. The centrality of the core cities is often reinforced through functional primacy in transport, communication, or science and technology, particularly in monocentric mega-regions or those with national core cities, such as Wuhan and Chengdu. We also find a superficial functional division in a few mega-regions with multiple core cities. For example, in the Greater Bay Area, Guangzhou is defined as the center for trade, transportation hub, and culture, while Shenzhen is identified as innovation and scientific research center. In contrast, the functional positioning of secondary cities is typically oriented to regional complementarity. In the Central-Guizhou mega-region, Zunyi's information industry and aerospace manufacturing become significant strengths, Bijie is expected to

focus on coal and mineral industries and agriculture, and Anshun turns to tourism and local manufacturing. Alongside individual city specializations, a preference for multifunctional corridor planning is evident in almost all mega-regional plans. In the Ningxia mega-region, the Yellow River is the main development axis linking all types of cities, and a top-down planning regime coordinates industrial, landscape, ecological, and social functions along that corridor. In summary, from a functional perspective, coexistence between core and secondary cities relies on the specialization and complementarity of the latter, sometimes organized along structural corridors, to maintain their attractiveness in the regional system. However, they must also comply with regional imperatives, such as preserving agriculture, ecology, and natural landscapes, while may forgo more profitable functional attributes.

Environment, ecology, and energy

In recent decades, addressing the severe costs of environmental pollution, ecological degradation, and energy waste resulting from rapid growth has become urgent (Zhang, Liu, & Zhang, 2022). Therefore, managing environmental pollution and hazards and responding to crises in energy and natural resources are coded as sub-themes of coexistence since they also contribute to coordinating core-secondary relations. First, spatial corridors and zones based on the natural landscape are the spatial foundation for ecological protection and environmental remediation. This redefines the overall morphology, turning the ecological structures into another essential element alongside urban areas to distribute socioeconomic activities. The non-urban territory is also expected to create multiple values, especially for secondary cities, such as tourism and ecological conservation and innovation. Second, both interventions to manage environmental pollution and respond to the energy crisis require inter-city joint governance. This includes shared responsibility for climate management and ecological restoration, upgrading heavy pollution and high energy consumption industries. In summary, the territorial ecology and environment in which cities coexist are considered essential for regional development. This places strict requirements on secondary cities, but the transformation towards eco-friendly economic growth models is starting to challenge their economic competitiveness.

3.5.2 Connectivity

Inter-city connectivity of labor, information, and materials facilitates the diffusion of regional agglomeration effects. We divide the relevant strategic interventions towards connectivity into three sub-themes: CON-1: Building a comprehensive transportation system; CON-2: Encouraging labor flows and open markets; and CON-3: Creating informational connections (Figure 3.4).

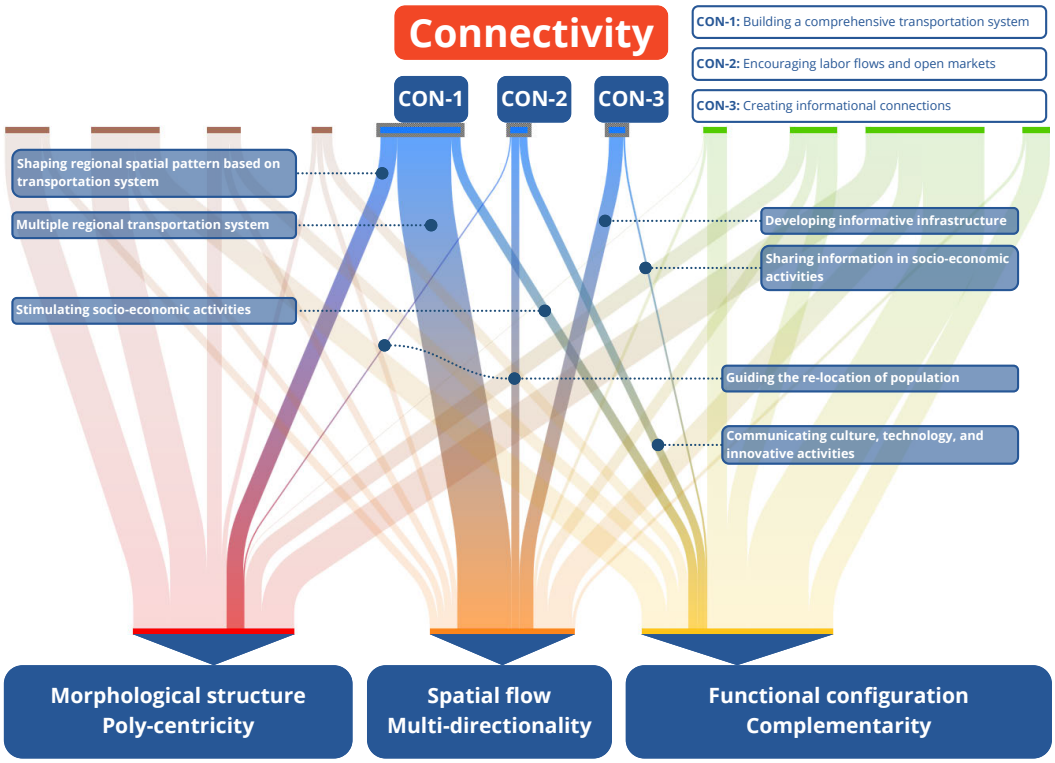

FIG. 3.4 Deconstructing the policy orientation of Connectivity

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Building a comprehensive transportation system

The inter-city transportation system is dominant in shaping regional connectivity networks, contributing 66% of the coded items on this theme. Planning transportation systems leads to a restructuring of morphological relations. First, it enhances centralization to create a stronger mega-regional core. The expanded road network in the Central-Guizhou mega-region integrates the core city of Guiyang and the neighboring secondary cities, creating a metropolitan circle with a one-hour traveling distance and a mega-regional economic center. Second, the authorities expect that transport connections can leverage the driving role of core cities and support secondary cities, as well as functional linkages between mega-regions. Regarding regional industrial cooperation, the Guiyang-Chongqing national transportation line serves as a basis for the main regional economic belt, connecting the core city, Guiyang, and an important secondary city, Zunyi, to encourage the expansion of equipment manufacturing, commerce, and logistics industries from cores to the secondary city. Third, upgrading the transportation system aims to exploit the secondary cities' assets. For example, cities in the mountainous area of the Guanzhong-Plain mega-region plan to attract cultural tourism through dedicated railway transportation. The pursuit of an integrated transportation system is reflected in all mega-regional plans, with multiple dimensions of rail, road, air, and water transport. Secondary cities are envisioned as essential nodes in regional networks and are expected to contribute to enhanced integration and benefit from regional economic externalities.

Encouraging labor flows and open markets

The encouragement of labor flows can also reinforce inter-city connectivity, especially in technology and information exchange. Policies and planning actions for talent mobility and attraction are on the agenda of almost all mega-regions, including entrepreneurship support and social service guarantees for workers. Building inter-city functional corridors promotes interaction and exchange. For example, in the Greater Bay Area, science and technology innovation corridors are planned to facilitate the intensive flow of talent, capital, information, and technology among cities. Additionally, the authorities want to guide the labor force flows to rebalance the regional morphology. Shanghai, for example, aims to control the inflow of population in the central area and alleviate overcrowding through the construction of satellite cities and associations with neighboring secondary cities. In response, these secondary cities, such as Wuhu and Taizhou, are determined to attract a more extensive and diverse labor force by releasing the restrictions on household registration.

Creating informational connections

Alongside transportation networks and labor flows, information linkages are an emerging approach to regional connectivity. In the Guanzhong-Plain mega-region, Xi'an (the core) and Baoji (a secondary city) plan to develop information infrastructures to create joint administrative databases and cloud computing platforms. Beyond information sharing and regional communication, this brings industrial development opportunities in secondary cities: Lvliang and Yangquan in the Central-Shanxi mega-region are being supported in building data and information industry clusters. Furthermore, the increasing information connectivity can respond to the functional unevenness between core and secondary cities, not only because information connection stimulates economic growth in secondary cities, but also helps to promote the equalization of accessibility in social resources, such as online access to health care activities in some cities.

3.5.3 Cooperation

Inter-city cooperation is often based on a self-motivated willingness among cities to achieve the benefits of complementary advantages. In mega-regions, cooperation relations coordinated by the higher-level government are increasingly valued, often targeting specific economic sectors, social issues, and environmental challenges (Li & Wu, 2018). Here we identify four sub-themes that receive specific strategic interventions: COO-1: Innovation and knowledge; COO-2: Conserving cultural and natural heritage; COO-3. Collaborating industrial clusters; and COO-4: Sharing public services (Figure 3.5).

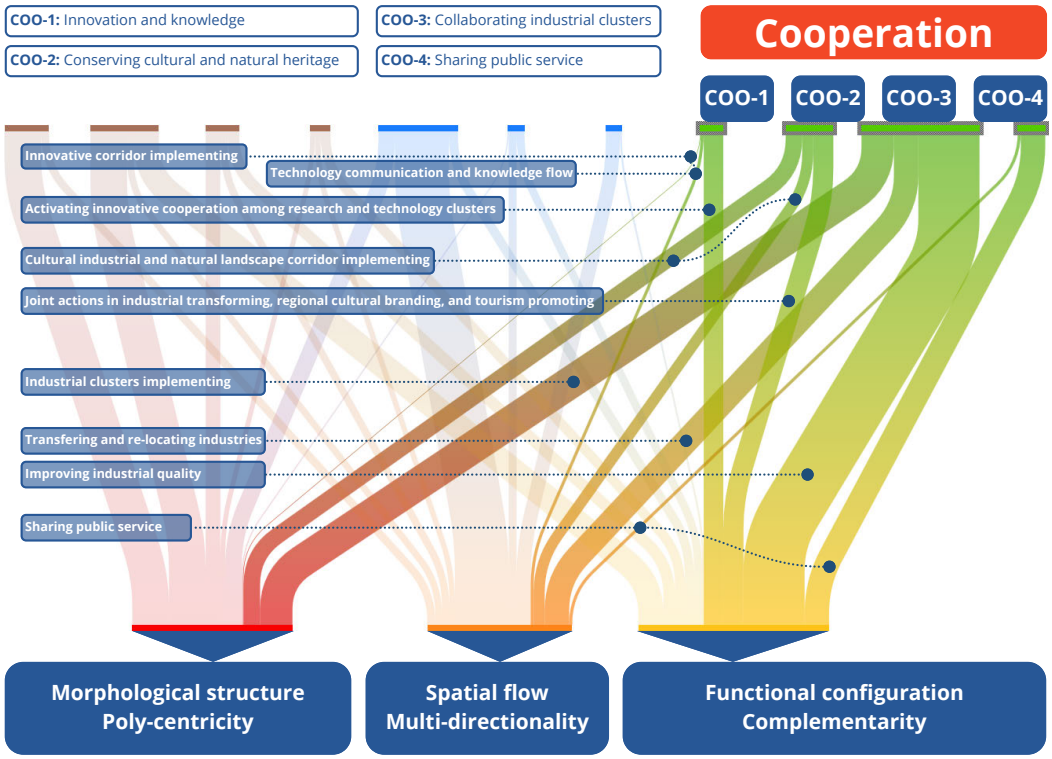

FIG. 3.5 Deconstructing the policy orientation of Cooperation

Innovation and knowledge

Knowledge sharing and innovation cooperation among cities drive socioeconomic transformation. For example, in the Central-Plain mega-region, the core city of Zhengzhou and the secondary city of Kaifeng plan to jointly establish an innovation corridor with a series of high-tech industrial parks located in the areas between both cities, aiming to integrate higher education and research institutions in both cities. Regional core cities tend to dominate regional innovation networks because of their assets in industrial technology, research talent, and academic institutions. However, secondary cities are encouraged to play a more significant role through multiple innovation activities. In the Shandong peninsula mega-region, the core cities Jinan and Qingdao take the lead in developing innovation platforms, while secondary cities like Yantai and Weihai are invited to use research facilities and share information according to their research needs, a strategy conceptualized as “regional innovation communities”. Another approach to enhance core-secondary spatial relations

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through innovation cooperation is the “brain + implementation base” model. The core city undertakes cutting-edge technology and knowledge creation, while the innovation outcomes can be applied to enterprises in secondary cities. For example, in the Beijing-Tianjin-Hebei mega-region, secondary cities cooperate with research institutes in Beijing to accelerate the upgrade of their high-tech industries. Innovation capacity is, therefore, a competence that secondary cities need to develop to integrate more extensively into mega-regional knowledge networks and economic cooperation.

Conserving cultural and natural heritage

Similar cultural backgrounds and natural landscapes motivate mega-regional cooperation towards heritage promotion and conservation, and secondary cities must seek a balance between conservation and development. The “corridor” remains a popular concept for the joint conservation and utilization of ecological and cultural heritage. Corridors often link heritage resources to provide a spatial foundation for the concentration of cultural brands, handicrafts, local agriculture, tourism, and relevant start-up industries. Secondary cities can take the initiative due to the inherent attractiveness of their cultural landscapes: along the Qingshui River in the Ningxia mega-region, local farmland and the related agricultural tourism, brands, and products have become a new driving force of urbanization. For natural landscapes and ecological heritage, cooperation among cities is not limited to the development of tourism and eco-industries but focuses more on the conservation of the ecological area. For example, in the Chengdu-Chongqing mega-region, functional zones related to species diversity protection, water purification, and soil treatment are implanted in the Wuling Mountains, which requires joint governance among surrounding cities.

Collaborating industrial clusters

Industrial cooperation is the most important component of cooperative relations among cities. The related strategic interventions contribute 48.5 % of the codes on the theme of cooperation. On one hand, industrial development visions in mega-regional plans determine the future shape of the regional spatial structure. Some mega-regions want to pursue a more dominant role for core cities through industrial concentration. For example, the Central-Guizhou mega-region aims to enhance the competitiveness of its core city, Guiyang, by identifying it as the core of industries such as big data, advanced manufacturing, finance, and exhibitions. On the other hand, spillover effects of core cities to benefit secondary cities are still anticipated.

Beijing's decentralization of over-concentrated industries is one of the tasks of the Beijing-Tianjin-Hebei mega-region. Beijing initiates cooperation with secondary cities, using its resources to support the transformation of Baoding's steel and chemical industries, and cooperating with Zhangjiakou in new energy vehicles and information industries.

Sharing public services

Sharing better quality public services in core cities is recognized as a practical approach to improve the living quality in secondary cities, by making such core facilities more accessible to residents of neighboring cities. Furthermore, core cities can decentralize educational, medical, and cultural facilities to the surrounding secondary cities by establishing branches, also as a way to relieve their own development pressure. Beijing, for example, plans to transfer medical, cultural, and educational institutions to secondary cities in Hebei province to avoid excessive population concentration. Besides, the authorities have also encouraged the creation of public service centers in densely populated areas other than mega-regional cores to improve their livability, such as secondary cities in the Chengdu-Chongqing mega-region, where social welfare, pension, and cultural facilities are planned as an integrated inter-city cluster of public services.

3.6 Governance mismatches in coordinating spatial relations

Chinese mega-regional spatial planning aims to coordinate core-secondary city relations through three themes of policy orientations – coexistence, connectivity, and cooperation – that potentially address the challenges of secondary cities. Although secondary cities are still not a priority concern in all mega-regional plans, we argue that the emphasis on these three themes and their associated strategic interventions has the potential to alleviate their problems of polarization and peripheralization. However, if mega-regionalization offers opportunities for secondary cities, we must acknowledge that it is not working as well as it should. To better understand why this is the case, we discuss three potential governance mismatches that still hold back secondary cities from overcoming intra-regional unevenness.

The discussion of governance failures among scholars has enriched our thinking, even though it does not explicitly target Chinese mega-regionalization as a regional governance process. Typical cases of governance failure can be categorized in two different sequences (Howlett & Ramesh, 2014): either the inadequate formulation of governance tools that fail to achieve the set goals, or the failure to utilize the relevant governance tools due to the lack of capacity of those who implement them. This can be linked to our focus on Chinese regional governance from a spatial relational perspective, which ultimately maps onto three classical concepts of regional development. When critically extending these arguments of governance failure to the characteristics of Chinese mega-regional development, we can conceptualize the inadequate coordination of spatial relations between core and secondary cities as three **governance mismatches**.

First, the literature on **network externalities** has long emphasized the potential of inter-city linkages to generate shared benefits through spillovers, functional complementarity, and resource sharing (Burger & Meijers, 2016; Meeteren et al., 2016). However, these discussions often assume that benefits will naturally diffuse from stronger cores to weaker peripheries, overlooking the temporal, spatial, and institutional constraints that may prevent such outcomes. This leads to a **place mismatch**, where the assumed spatial reach and inclusivity of regional benefits do not align with the actual capacity of secondary cities to access or utilize them. This originates from the rapid development path of mega-regionalization in China in the past 40 years (Tang et al., 2022), starting with the unofficial mega-regional cooperation system formed around Shanghai in the 1980s with the goal of economic growth and foreign investment attraction, and then in the post-millennium period with the megacities acting as engines of regional development (Wu, 2016). It implies that, in order to enhance regional competitiveness based on an integrated and enlarged network system, the authorities have either actively pushed for the extension of infrastructure to enhance the connectivity among cities (Harrison & Gu, 2021), or planned the process of metropolization to expand the power and dominance of the core cities (Jaros, 2016). Little attention has been paid to the readiness of secondary cities to participate in this transformation game into a new spatial system seeking greater overall competitiveness (Jonas, 2020). Regarding coexistence, secondary cities can take population, knowledge, and industry spillovers from core cities and improve their functional positioning. Regarding connectivity, the transportation infrastructure reinforces interactions between core and secondary cities. Regarding cooperation, complementary functions and an appropriate division of labor allow core cities to support secondary cities in technology, investment, and services. However, these imaginary visions are based on the assumption that secondary cities have the capacity to rapidly adapt to take on critical functional roles and build closer relationships with the cores towards beneficial externality.

In fact, the challenge faced by many secondary cities is that they are unable to benefit from mega-regionalization because of their lack of such multidimensional capacity (Lambe, 2012): attractiveness, experience, and resources. Furthermore, these cities cannot refuse to participate in this process of spatial transformation and must face ever-intensifying infrastructural linkages and an increasingly powerful core city, as discussed in the policy orientations study. As a result of this capacity-based place mismatch, mega-regionalization processes increase the polarization and peripheralization of secondary cities.

Second, studies of **inter-city competition and cooperation** highlight the dual role of rivalry and collaboration in shaping regional development. While cooperation is framed as a desirable pathway to coordination, entrenched competition for resources often dominates, limiting the scope for mutual gains (Zhang et al., 2025). This creates a priority mismatch, as the stated objectives of balanced development and functional complementarity are undermined by the prevailing incentive structures that privilege competition over cooperation, or fail to integrate the two productively. Therefore, the second governance mismatch arises as **priority mismatch**. This allows core cities to prioritize their own development rather than build partnerships with secondary cities based on financial, knowledge, and technological support, as advocated by planning policy. Over the past decades, central governments have been conservative in their attitudes towards large cities: they do not want to see the excessive rise of megacities but instead value equalitarianism. For example, in the Seventh Five-Year Plan (1986–1990), it was explicitly announced that the central government would resolutely prevent the over-expansion of large cities and place the priorities of development on small and medium-sized cities and towns (CNDRC, 1986). However, in the Ninth Five-Year Plan (1996–2000), emphasis was gradually placed on the creation of new territorial cooperation units with large cities as central pillars, conceptualized as “economic circles”, in order to highlight their status as economic engines (CNDRC, 1996). In this way, the authorities have recognized the development and expansion of large cities as economic growth machines, which have come at the cost of severe intra-regional unevenness, as mentioned previously. As a result, initiatives for mega-regional cooperation have gradually replaced the encouragement of competition, with a recentralization of mega-regional governance attempting to manage the vicious competitive relations between cities. However, the lack of willingness of the core cities to cooperate under this new model has hindered the achievement of the policy orientations. Existing studies uncover this difference in regional cooperation priorities. For example, Hebei Province took the initiative to Beijing based on the Beijing-Tianjin-Hebei Integration Plan issued by the NDRC in 2006, but Beijing did not accept the term “integration” and only suggested the possibility of cooperating with Hebei’s relevant secondary cities under certain conditions with an emphasis on its own interests (Li

& Jonas, 2023). In the case of lagging mega-regions with more limited resources, the preference for core cities is even more pronounced, as evidenced by the policy of "strengthening regional capitals" (Zhang, Tian, & Sohail, 2022). Even though mega-regional planning agendas favor of a more cooperative and balanced system where smaller cities play important roles, the big cities have retained a competitive mindset to consolidate their dominance in the region, and prioritize their own development rather than the demands for inter-city cooperation, further contributing to polarization and peripheralization.

The two governance mismatches mentioned above concern, respectively, the capacity of secondary cities to integrate into mega-regional systems and the unwillingness of core cities to face a new cooperation-oriented development scenario. They have been somewhat alleviated in recent years. On one hand, the strengths of the secondary cities are gradually being tapped into, and some cities are emerging as competitors in the region. For example, Dongguan, located close to Guangzhou, Shenzhen, and Hong Kong, has become a substantial manufacturing base in the Greater Bay Area (Wang et al., 2016). On the other hand, cooperation between core and secondary cities is gradually being established under the coordination of higher-level government. The Shenzhen-Shanwei economic cooperation zone is a compelling example, where the core city has taken on the responsibility of driving the industrial transformation of the secondary cities (SCGD, 2023; Zhang & Sun, 2019).

However, a third governance mismatch obstructs mega-regionalization's potential to respond to the former two. The **multi-level governance** perspective examines the vertical and horizontal interactions between different governance tiers and stakeholders (Hooghe & Marks, 2010; Feiock, 2009). Although coordination is a central aim, mismatches frequently emerge between visionary top-down strategies and bottom-up implementation realities, as well as between core and secondary cities in horizontal relations. These dynamics give rise to an **actor mismatch**, where divergent interests, uneven power relations, and unclear shared goals hinder the effective alignment of governance processes across scales. This is triggered by the imbalance of political voice between core and secondary cities in the mega-regional system. That is to say, the term "secondary" does not only mean that these cities are smaller in terms of population, economy, and built-up land, but more importantly, in terms of unequal political power relations. This inequality has a direct impact on the policy effectiveness of mega-regions. Spatial relations based on industrial linkages, as identified in the policy orientations analysis, are a good example. As mentioned in the coexistence theme, core cities are expected to gradually transfer industrial clusters, firms, and labor to neighboring secondary cities to reduce their development pressures. At the connectivity level, infrastructure links enhance

exchanges between the industries of core and secondary cities and allow the former to support the latter. At the level of cooperation, the authorities encourage closer spatial relations between core and secondary cities, including the co-development of new emerging industries, and joint governance actions towards industrial transformation. However, such spatial relations have not contributed to development opportunities for secondary cities due to the unequal political power of the actors involved. In the Beijing-Tianjin-Hebei mega-region, for example, Hebei hopes to locate its industrial clusters in the vicinity of Beijing to take advantage of investment attraction and technological support, and was limited by Beijing's objections to potential pollution from these industries (Li & Jonas, 2023).

Mega-regionalization seems to offer opportunities for core cities to establish closer connections with neighboring secondary cities under the pretext of "regional integration" (Jaros, 2016; Zhang & Sun, 2019; Zhang & Wu, 2006). But the shift to recentralized mega-regional governance does not seem to cope with such a dilemma. As Li and Jonas (2023) point out: "these initiatives did not achieve substantial progress towards metropolitan or regional integration because none of the departmental promoters on either the planning side or the NDRC side was powerful and authoritative enough to coalesce the localities." To some extent, the growth pattern centered on large cities continues despite what if formulated in planning policies. The concept of "state spatial selectivity" plays a role, by organizing urban (regional) functional and productive space through careful national policy arrangements guided by a broader development strategy. Such policies aim to create new "champion urban regions" (Zhong & Su, 2019). Thus, the expectations of large cities as growth machines have not diminished, and industrial clusters with higher profitability have been spatially located in the core of mega-regions and only in a few critical secondary cities (Herlevi, 2017; Tang et al., 2022).

3.7 Discussion and conclusion

The growing development gap between core and secondary cities in Chinese mega-regions is increasingly worrying, and the challenges of polarization and peripheralization are becoming bottlenecks for regional sustainability. The mega-region is an emerging spatial governance concept to promote regional coordination, thus offering a chance to tackle the secondary cities' challenges, but it does not necessarily alleviate polarization and peripheralization. In the face of this problem, we analyzed the spatial relations between core and secondary cities, aiming at a deeper understanding of intra-regional unevenness. We developed a three-step conceptual framework (Figure 3.6). First, we borrowed existing frameworks to define three relational categories guiding the visions behind mega-regions: morphological polycentricity, flow multi-directionality, and functional complementarity, which supported the systematic study of mega-regional planning policies. Then, we explored the policy orientations of mega-regional planning in response to the challenges faced by secondary cities and extracted three main themes: coexistence, connectivity, and cooperation. Coexistence implies the need for core and secondary cities to set their development directions based on shared rules and visions, including spatial, functional, ecological and environmental considerations. Connectivity refers to managing multi-directional population flows, infrastructure extension, and information exchanges. Cooperation includes strategic interventions regarding industry, knowledge and innovation, heritage preservation, and shared services.

Finally, we take a critical position on why mega-regionalization, an ambitious approach towards regional coordination, fails to address the problem of intra-regional unevenness. We conceptualize a place mismatch, caused by the lack of inherent capacity of secondary cities to adapt to rapidly changing regional integration paths and emerging cooperation networks due to a lack of governance capacity, resources, and endowments; a priority mismatch, caused by the unwillingness of core cities to follow policy orientations towards coordinating spatial relations, as they remain more concerned with consolidating their dominance in the regional system than with supporting a more balanced mega-region; and an actor mismatch, referring to the imbalanced power relations between core and secondary cities, as the latter lack the political voice to co-direct integration and cooperation processes for their benefit.

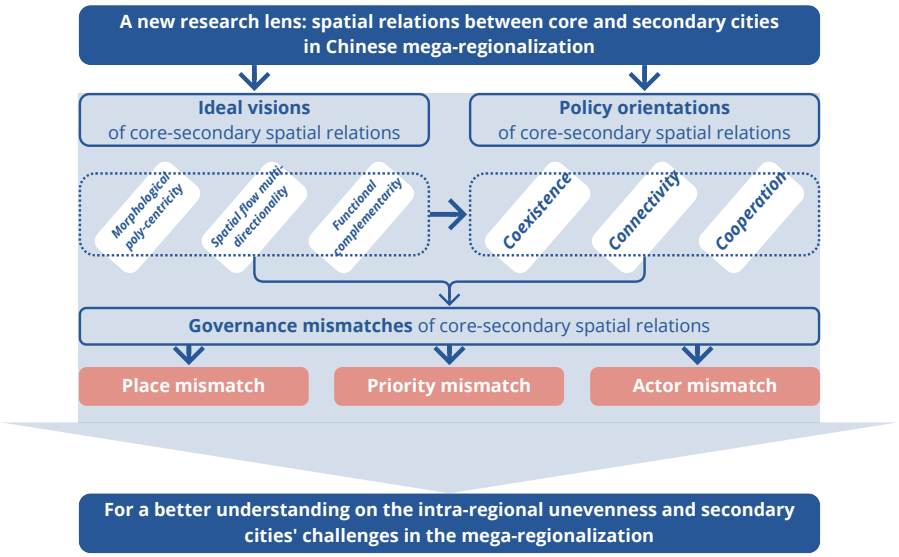

FIG. 3.6 Conceptual framework for the understanding on the core-secondary spatial relations

Despite this comprehensive conceptual framework, it is important to recognize that there are huge differences among Chinese mega-regions, in terms of socio-economic development, geopolitics, and functional positioning (Fang, 2015; Harrison & Gu, 2023). In this chapter, we did not emphasize this variation but found that despite their differences, policymakers prefer to use similar terminology to elaborate visions and related strategies. We argue that this is because all mega-regions play similarly important roles in "imagined planning" at the national level. For example, in most mega-regional plans, the core cities are the centers of political, economic, cultural, transportation, and innovation development. In other words, similar planning policies across different mega-regions try to create similar core-secondary spatial relations, which leads to highly contrasting fortunes of secondary cities, as recently shown by Du et al. (2024).

When comparing our conceptual framework with international research, spatial patterns and governance paradigms are also the two main perspectives to focus on mega-regional unevenness (Hanssens et al., 2014; Innes et al., 2010). For example, secondary cities can benefit from the polycentric model of the Randstad in the Netherlands (i.e. borrowing size: Meijers & Burger, 2017). However, the overly fragmented administrative system in this region creates practical barriers to regional governance with a common vision. Discussions on the core-secondary spatial relations appear in both perspectives. While polycentricity constantly emphasizes the greater role that secondary cities should play in the regional system, the dominance

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of core cities is increasingly entrenched in highly marketized and capitalized networks. In Switzerland, for example, the knowledge economy continues to agglomerate in large cities, while secondary cities must attract business from global firms through favorable tax policies or targeted services (Thierstein et al., 2008).

These two perspectives are in line with the lens we adopt in this chapter. Globally, there is potential for mega-regionalization to tackle intra-regional unevenness. This is also applicable to the Chinese context, however, from the governance perspective, the differences between China and other countries raise different concerns. First, the over-ambitious scale of Chinese mega-regions (Harrison & Gu, 2021) makes beneficial interactions between cities harder to achieve and more likely to polarize talent, investment, and technology in the core cities. Second, China prefers a top-down approach to promoting mega-regionalization. This improves the efficiency, but may lead to over-dominance by the core cities or a mismatch between the policy vision and the development needs of the secondary cities. Clearly, the governance mismatches we propose are specific to the Chinese context.

Another innovative contribution of this chapter is to frame the policy orientations of mega-region authorities within coexistence, connectivity, and cooperation. We have yet to find a similar conceptualization in the global context, but these approaches are widely practiced. Coexistence appears in the Transportation and Climate Initiatives in the United States in response to the climate crisis (Ross et al., 2016), or the revitalization of the Rhine-Ruhr region through regional branding (Goess et al., 2016). Regarding connectivity, the regional railroad system in Japan reinforces population mobility across cities (Hiramatsu, 2023). In Munich, informational links between large APS firms define a polycentric regional system where secondary cities provide high value (Lüthi et al., 2010). As for cooperation, the emergence of inter-city collaborative bodies promotes the optimization of governance practices, including information exchange, data sharing, and strategic planning (Ross et al., 2016). The conceptualization and potential impacts on secondary cities of these practices are similar to what we found in Chinese policy, considering the differences in spatial and governance contexts.

In summary, this chapter unravels the spatial relations between core and secondary cities as a new lens to understand intra-regional unevenness. This has significant implications for both academia and practice. To start, the framework serves as an analytical tool that can lead to more in-depth empirical investigations. For example, the three policy orientations extracted from the spatial planning documents provide a theoretical basis for more detailed case studies (e.g., focusing on a specific city or mega-region) to clarify relevant governance strategies and actions and study the implications of existing coordination policies. In addition, the three governance

mismatches (place, priority, and actor) can be further developed into different research questions to understand the potential negative side effects of mega-regionalization governance on secondary cities. They can, to some extent, remind policymakers of the need for risk aversion in planning practice to build a more balanced mega-regional system. In conclusion, this conceptual framework utilizes nine specific concepts through three sub-studies to understand the complexities of the spatial relations between core and secondary cities in mega-regions. It is the first conceptualization of such a complex system of mega-regions in China grounded in the challenges of secondary cities and seen from their perspective. It aims to stimulate a broader discussion about a more efficiently functioning, structurally rational, and sustainable mega-regional system.

Appendix

List of planning documents

Mega-region	Planning documents	Issued institution	Issued date
Harbin-Changchun mega-region	*Development plan for Harbin-Changchun mega-region*	National Development and Reform Commission (NDRC)	March. 2016
Beijing-Tianjin-Hebei mega-region	*The fourteenth five-year socioeconomic plan for Beijing**	People's Government of Beijing	January. 2021
	*The fourteenth five-year socioeconomic plan for Tianjin**	People's Government of Tianjin	February. 2021
	*The fourteenth five-year socioeconomic plan for Hebei**	People's Government of Hebei	
Central-Shanxi mega-region	*High quality development plan for Centra-Shanxi mega-region*	People's Government of Shanxi	October. 2022
Hohhot-Baotou-Ordos-Yulin mega-region	*Development plan for Hohhot-Baotou-Ordos-Yulin mega-region*	NDRC	February. 2018
Ningxia mega-region	*Strategic development plan for Ningxia**	People's Government of Ningxia Autonomous Region	March. 2016
Lanzhou-Xi' ning mega-region	*Development plan for Lanzhou-Xi' ning mega-region*	NDRC, and Ministry of Housing and Urban-Rural Development (MHURD)	March. 2018
Tianshan North Slope mega-region	*The fourteenth five-year socioeconomic plan for Xinjiang autonomous region**	People's Government of Xinjiang Autonomous Region	February. 2021
Guanzhong-Plain mega-region	*Development plan for Guanzhong-Plain mega-region*	NDRC, and MHURD	February. 2018
Chengdu-Chongqing mega-region	*Development plan for Chengdu-Chongqing mega-region*	NDRC, and MHURD	May. 2016
Central-Guizhou mega-region	*Development plan for Central-Guizhou mega-region*	Guizhou Provincial Development and Reform Commission	April. 2017
Central-Yunnan mega-region	*Development plan for Central-Yunnan mega-region*	People's Government of Yunnan	August. 2020
Beibu gulf mega-region	*Development plan for Beibu gulf mega-region*	NDRC, and MHURD	February. 2017
The Greater Bay Area	*Outline development plan for the Guangdong-Hong Kong-Macao Greater bay area*	The State Council of the People's Republic of China	February. 2019
West-Taiwan strait mega-region**	*Development plan for West Taiwan strait economic region*	NDRC	March. 2011

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List of planning documents

Mega-region	Planning documents	Issued institution	Issued date
Middle Yangtze river mega-region	*Development plan for Middle Yangtze river mega-region*	NDRC	April. 2015
Yangtze river delta mega-region	*Development plan for Yangtze river delta mega-region*	NDRC, and MHURD	June. 2016
Central-Plain mega-region	*Development plan for Central-plain mega-region*	NDRC	December. 2016
Shandong peninsula mega-region	*Development plan for Shandong peninsula mega-region*	People's government of Shandong	December. 2021
South-central Liaoning mega-region	*Development plan for South-central Liaoning mega-region*	People's government of Liaoning	September. 2018

** All planning documents are obtained from the relevant official governmental websites. We are not able to collect planning documents related to the Beijing-Tianjin-Hebei Coordinated Development Planning Outline, Ningxia Yellow River Mega-region, and the Tianshan North Slope Mega-region, so we used the relevant chapters in Overall development plan of Ningxia and The 14th Five-Year Plan of Beijing, Tianjin, Hebei, and Xinjiang, which have detailed arrangements for the development of these three Mega-regions as substitutes.*

*** The West Taiwan strait mega-region was renamed as Guangdong-Fujian-Zhejiang coastal mega-region in the 14th Five-Year Plan. Since the related plan was not promulgated so far, we followed the original name.*

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Working in large cities is often seen as the main “way out” for residents of smaller cities, as it promises more job opportunities and higher incomes. This form of out-migration is common across secondary cities: whether construction workers, scientists, or engineers, leaving smaller cities has become a shared aspiration for many.

An inter-city bus station in Anshan, photographed by Jiacheng Xu.

TOC

4 Blind spots of state spatial selectivity

The left behind secondary cities in Chinese mega-regionalization

The content of this chapter is currently revised and resubmitted to the journal Urban Studies.

ABSTRACT Chinese intra-regional unevenness remains unresolved, despite the mega-regionalization has been promoted as the main carrier of state spatial selectivity processes aimed at alleviating challenges of polarization and peripheralization in secondary cities. We argue that the so far neglected intermediate stage of such processes is partly responsible for the inefficiency of mega-regionalization in tackling these challenges. This stage is the bridge between mega-regional visions initiated by higher-level authorities and practical interventions at the local scale, organized in action plans that determine relations between core and secondary cities by state actors in the provincial level. We select three representative Chinese mega-regions and examine the yearly reports from 2006 to 2024 of the provincial governments (as mega-regional coordinators) to summarize the various mechanisms and periodic trends of these plans, based on the analytical concept of historical institutionalism. We find that the intermediate stage, focused on spatial reconfiguration, redistribution of urban functions, and improving regional accessibility, emphasizes the cores as the driving force, leaving blind spots that give only a few secondary cities the opportunity to integrate and benefit from mega-regionalization while many more are further polarized and peripheralized. This is evidenced in all three mega-regions despite their different trends in specific action plans. We highlight the impact of intermediate stage action plans on secondary cities to expand the theoretical horizons of spatial selectivity as a concept for Chinese mega-regionalization and call for broader policy and governance attention.

KEYWORDS State spatial selectivity; Chinese mega-regionalization; secondary cities; regional coordination; policy analysis; historical institutionalism.

4.1 Introduction

Increasingly flexible and diversified urban economies have emerged in the post-Fordist era. Markets have become a key driver of industrial clustering and population mobility, catalyzing the rise of "regions" as crucial spatial formations of development. Since the 1970s, regional development in Western counties has therefore decentered the role of the **national state** as the dominant policy actor (Zhang et al., 2025). However, scholarly critiques argue that the state has not stepped back; rather, it has been reorganized and embedded in market-oriented regulatory reforms in more adaptive ways (Brenner, 2004). On this basis, debates on state spatiality, institutional restructuring, and the reconfiguration of accumulation regimes have converged on an important argument: instead of a fixed, clearly bounded container, the state is better understood as a multi-scalar, multi-locational governance process being continuously and strategically reassembled (Li et al., 2014). From this perspective, **state spatial selectivity** is a core mechanism of the process of restructuring state power, which "… *implies that the state has a tendency to privilege certain places through accumulation strategies, state projects, and hegemonic projects. The process of geographical privileging, …, takes on both material and ideological forms*" (Jones, 1997, 831). Brenner (2004) further extends the concept to discuss how state roles are expressed across different scales and territories to deliver spatial fixes, aiming to correct neoliberal regulatory deficits and their consequences, such as ineffective inter-city competition and redundant production.

This concept has been widely applied in the Chinese context to explain the motivations of the state behind post-reform regionalization (Zhang et al., 2025). The state selectively nurtured growth poles through preferential policies and resource allocations directed at selected cities since the 1980s, aiming to stimulate national economic development and, later in the 2000s, rebalance the development divide between coastal and inland regions (Wu et al., 2016). This generated substantial wealth in these central cities but, under intense marketized competition and widened regional unevenness, led to challenges of polarization and peripheralization of smaller cities, with an increasing outflow of development resources, including talent and investment, to the cores and a decreasing functional, economic and political importance of smaller cities in the regional system (Huang & Zong, 2021; Li & Jonas, 2023). This study focuses on this **intra-regional unevenness**, the widening development disparities between the privileged growth poles and surrounding smaller cities in Chinese regions.

In response to the problem, the "**mega-region**" has been defined as the main platform for regional development in the 2006 Eleventh Five-Year Plan (CNDRC, 2006). It links one or two economically and politically dominant cores with surrounding smaller cities to promote inter-city coordination in economic growth, social integration, and spatial restructuring (Yeh & Chen, 2020). This marks a re-centralization of state actors in regional governance, as the implementation of mega-regional visions proceeds through both state spatial projects (the state organizational reconfiguration, such as dedicated planning frameworks or cross-provincial coordination bodies) and strategies (state interventions shaping socio-economic development, such as national transport corridors, industrial clusters and cooperation platforms) (Ma & Tang, 2019; Brenner, 2004). On this basis, previous studies interpret the mega-region as a new form of Chinese state spatial selectivity (Wu et al., 2016): its nationwide rollout over the past two decades constitutes state rescaling by building multi-level coordination (e.g. Li et al., 2014); state rebordering by emphasizing soft boundaries through corridors, functional zones, and cooperation areas beyond administrative lines (e.g. Sun & Chan, 2017); and state reterritorializing by reorganizing certain institutional territories to promote the redistribution of capital, political focus, and development resources (e.g. Zhang et al., 2023).

Mega-regional coordination has been widely regarded as a panacea for unevenness. On one hand, it emphasizes a polycentric spatial and functional structure, in which small and medium-sized cities are expected to play a significant role comparable to large cities (SCC, 2024). On the other hand, such coordination relies on integrated governance approaches to tackle common challenges, and to construct a more cohesive economic system based on the complementary advantages of different cities (Li et al., 2022). However, nearly two decades after mega-regions became the primary form of state spatial selectivity in China, intra-regional disparities have not been effectively alleviated, arguably due to the uneven spatial relations, at the level of spatial interactions, functional linkages, and network flows, between core cities and their surrounding smaller counterparts (Du et al., 2024a). In this paper, we conceptualize these smaller players **within** mega-regional systems as **secondary cities** to highlight these uneven spatial relations driven by their disadvantaged political and functional positioning vis-à-vis the dominant cores (Li & Jonas, 2023).

Within this process, state actors tend to demonstrate flexibility in managing market relations, allocating resources, or fostering social engagement, adopting different roles to improve coordination between core and secondary cities (Li et al., 2014; Zhang et al., 2025). However, this flexible recentralization of state actors has not mitigated intra-regional unevenness. While existing studies have shed light on the struggles faced by secondary cities, such as their asymmetrical political and economic strength compared

to core cities (Li & Jonas, 2023), one important analytical lens remains underexplored, namely the **intermediate stage** of the multilevel state actor structure of mega-regional governance. To specify, mega-regional coordination is often structured through a hierarchy of state actors. At the top, national authorities initiate, promote, and guide inter-city coordination primarily through visionary planning (Harrison & Gu, 2021). These visions are then interpreted, adapted, and operationalized by provincial governments and associated political sectors, who are mobilized to supply regulatory, financial, or institutional support for mega-regional coordination (Li et al., 2022). Finally, local governments, typically municipalities and their functional departments, are tasked with responding to on-the-ground challenges and managing non-state actors on specific strategies or projects, thus promoting inter-city coordination. This study conceptualizes the intermediate stage as the specific moment and scale at which provincial governments translate national visions into more concrete, short-to-medium-term arrangements of governance actions. In practice, alternative regional coordination entities, such as the Yangtze River Delta regional cooperation office established in 2000s, have often struggled with these tasks due to fragmented institutional structures (Li & Wu, 2018). As a result, provincial governments frequently assume the role of de facto mega-regional **coordinators**, not only orchestrating intra-provincial collaboration but also facilitating cross-provincial negotiations among cities (Zhou et al., 2018). In this way, a series of "**action plans**" materialize the visionary plan, provide overall arrangements for local interventions, and translate long-term goals into recognizable current priorities that stakeholders can engage with.

This intermediate stage is a valuable lens for reflecting on secondary city challenges: although visionary plans typically outline balanced regional systems that give significant roles to secondary cities, we aim to understand **to what extent action plans at the mega-regional intermediate stage consider and (re)position secondary cities in newly coordinated relations with core cities**. The objective is to identify the mismatches between the visionary planning of national state actors and the concrete action plans of provincial state actors acting as mega-regional coordinators, ultimately discussing why the ongoing strategic repositioning of the state in mega-regions has not effectively tackled secondary city challenges.

This study contributes to research on state spatial selectivity from two perspectives. On one hand, it expands its theoretical horizons by focusing on the state roles of provincial governments as mega-regional coordinators and their impact on secondary cities, illuminating the in-between scales between the widely discussed state-level ambitions and the experiences of individual cities. On the other hand, the study reveals the potential limitations of state actors at different scales regarding secondary city challenges. While mega-regionalization is promising for regional rebalancing, its intermediate stages often create blind spots that exacerbate the

problem of intra-regional unevenness. This is relevant for regional governance practices by clarifying the reasons for the (weak) positions of secondary cities, enabling more targeted policy responses. In the next section, we select the theoretical lens and analytical framework. Section 3 develops the research design anchored in a policy analysis of the positioning of secondary cities in action plans from a historical institutionalism perspective. Section 4 summarizes the repositioning periodic trends, section 5 reveals the consistent mechanisms over time, and section 6 discusses the causes of the failure. The paper concludes with a reflection on the ineffectiveness of spatial selectivity in addressing secondary city challenges.

4.2 The state actors in spatial selectivity and the role of secondary cities

4.2.1 Secondary cities: a concept grounded in spatial relations

Scholars often cite evidence from different approaches to alleviating secondary city challenges, including planning polycentric spatial structures (Kloosterman & Musterd, 2001), regional integration promoting inter-city cooperation and urban network externalities (Burger & Meijers, 2016), and functional arrangements optimizing the spatial division of labor (Liu, 2019). Although secondary cities may not be central policy considerations, their vulnerable position can be improved by restructuring regional planning at morphological, functional, and spatial flow levels. These debates are rooted in the **spatial relations** between core and secondary cities which characterize the ideal spatial structure of mega-regions: not a hierarchy of cities, but rather a complex and dynamic network of relations among cities (Cardoso & Meijers, 2016; Meijers et al., 2018; Yeh & Chen, 2020). Assuming that this process favors secondary cities, state actors should promote regional systems that are morphologically polycentric, functionally complementary, and multi-directional in terms of flows (Burger et al., 2014). Conversely, the polarization and peripheralization of secondary cities can arguably be attributed to uneven spatial relations, such as the over-dependence on a monocentric growth pole, unidirectional mobility flows driven by the greater attractiveness of the cores, and the over-concentration of advanced functions.

Our definition of secondary cities is based on such a lens of spatial relations within mega-regions. At the national scale, cities such as Beijing, Shanghai, Guangzhou, and Shenzhen are commonly identified as "primary" or first-tier cities, whereas large metropolitan areas such as Wuhan are ranked as second-tier according to socio-economic indicators (Yicai, 2024). However, because this study aims to explore unevenness in mega-regional systems, our focus lies at the intra-regional level. Secondary cities within mega-regions are therefore defined as the smaller mega-regional centers beyond the dominant cores. These are mostly ordinary prefecture-level cities, excluding centrally administered municipalities, provincial capitals, and sub-provincial cities (Zhou et al., 2018). Functionally, they often lack advanced services and innovative industries, and are often characterized by low-end, labor-intensive, and low profit economic activities (Zhang, 2015). Politically, their roles are subordinated to cores that receive preferential policies as regional growth machines (Zhou et al., 2018). The heterogeneity among secondary cities is also remarkable, as some demonstrate strong embeddedness in regional networks and benefit from this, while others remain marginalized. These differences will be further discussed in our case selection (see Section 3.1).

4.2.2 Mobilizing state actors towards core-secondary coordination

The rise of mega-regionalism has often been conceptualized as part of neoliberal urban expansion, in which subnational spaces are constructed to enhance competitiveness (Scott, 2001). Yet, this process has generated considerable tensions, most notably over-marketization and governance fragmentation (Jonas & Moisio, 2018). Chinese mega-regionalization highlights the multidimensional interventions of state actors to facilitate spatial selectivity, which are deeply embedded in the state's regulatory regime and developmental strategies, in response to widening inter-city disparities (Li & Jonas, 2019; Song & Zhang, 2025). Within current debates, there are two dominant interpretations of state roles in such a spatial selectivity process. On one hand, a speculative logic emphasizes market-driven dynamics, whereby local governments pursue the proliferation of "state-selected" spaces at local level for capital accumulation such as new towns or industrial parks (Song & Zhang, 2025). On the other hand, a state-led logic stresses top-down governance promoting cross-jurisdictional coordination by promoting inter-city integration as "state-selected" spaces at national level (Wu, 2016).

The multi-scalar engagement of state actors is evident in both, but with different objectives. Market-driven expansion and land monetization have intensified uneven development (Liu et al., 2016). This reflects the speculative orientation of local state

actors under market pressures, a tendency also conceptualized as moving towards state entrepreneurialism (Song & Zhang, 2025). The national state, in contrast, emphasizes cooperation by promoting discourses such as “regional equilibrium” , “integrated development”, and “common prosperity” (SCC, 2024), encouraging the functional decentralization of cores. The tension between two is manifest in local planning practice, where cities navigate between responding to central coordination initiatives and pursuing their own competitive interests, often resulting in “competitive cooperation”, i.e. collaboration only when interests align and benefits are maximized at minimal cost (Lingfan et al., 2025).

In this process, different state actors deploy distinct instruments and mechanisms (Figure 4.1). National state actors (e.g., the State Council or related ministries) rely on centralized planning, targeted policy, and strategic investments to promote mega-regional coordination (Wu, 2016). Local state actors frequently form growth coalitions with market actors, relying on land transactions, flexible regulations, or industrial platforms to secure fiscal revenues, in which constrain local-scale planning (Song & Zhang, 2025). For secondary cities, this dynamic is especially consequential because of their weak political and functional position in the mega-regional system. For example, some secondary cities tend to promote industrial parks together with the cores to facilitate innovation and technology transfer, but lack jurisdictional and decision-making powers, while cores tend to consolidate a monopolistic position (Wang & Zhao, 2025). This exemplifies the gaps between the ideal vision of national state actors and the experience of local authorities.

As previously explained, provincial state actors often act as mega-regional coordinators by translating national visions into short-term, actionable plans, as well as mediating cross-city conflicts at the mega-regional scale through resource allocation and regulatory enforcement (Li et al., 2014; Liu & He, 2024), which offers opportunities to tackle the challenges confronting secondary cities. However, they can be stuck in a dilemma: whether to prioritize responding to unevenness in secondary cities, or focus on the development and competitiveness of the overall region (Zhou et al., 2018). The latter option, however, is often equivalent to giving political and economic preference to the regional core as the main development catalyst, ignoring smaller players (Ke & Feser, 2010). The attitude of these coordinators is, therefore, particularly important, and their choices directly determine the fortunes of secondary cities in mega-regional systems.

4.2.3 The intermediate stage as a pivot of mega-regional support for secondary cities

Up to this point, two important argumentations can be framed from the current literature. First, the difficulties in addressing the unevenness challenges faced by secondary cities can, partially, be attributed to the divergent pursuits and expectations of mega-regional coordination among different levels of state actors. Second, provincial state actors, as mega-regional coordinators, constitute the pivotal role in coordinating these expectations towards successful implementation. But to further explore why this intermediate stage has not effectively addressed core-secondary unevenness, we need to examine what coordinators at that level are expected to deliver. Du et al. (2024a) propose a "3-COs" framework to conceptualize such coordination from the perspective of national policy orientations, which is the level where the role of secondary cities is more emphasized. Mega-regional coordinators are expected to translate these general orientations into concrete action plans and support secondary cities' integration into mega-regional systems through an appropriate (re)positioning.

- First, **CO-existence**. This highlights the shared fortunes that bind core and secondary cities together. It underscores the need for appropriate spatial arrangements and resource allocations that avoid excessive competition and socio-economic imbalance (Sahasranaman, 2012). Secondary cities, in this regard, can play the role of balancing nodes, absorbing spillover development from cores, hosting complementary industries, thereby benefiting from a more equitable distribution of investment and public resources (Tallec, 2023).

- Second, **CO-nnectivity**. This emphasizes the region as a networked system in which inter-city connections form the spatial foundation for flows of infrastructure, information, and trade (Pan et al., 2020). For secondary cities, connectivity offers opportunities to develop physical connections and enable communication flows with the core cities (Burger & Meijers, 2016). In doing so, secondary cities can leverage mega-regional transport and digital infrastructures to overcome marginalization and enhance their functional positioning.

- Third, **CO-operation**. This stresses the need for collaborative platforms and opportunities for collective improvement and common responses to shared challenges. By participating in cross-city governance platforms, regional industrial alliances, or functional integration (Terfrüchte & Growe, 2024), secondary cities can be positioned as collaborative partners within regional system rather than passive followers.

The intermediate stage, as defined here, reflects the coordinators' preferences and focus in response to these top-level expectations. Provincial governments therefore develop action plans as a vehicle for short- and medium-term collaborative arrangements, including resource relocation, division of labor, and functional positioning. However, if these action plans keep the priority on the cores, or lack knowledge of local conditions, priorities, and resources before becoming concrete practical interventions at the individual city level, the intermediate stage may not correspond to the attention that national visionary planning pays to secondary cities, resulting in the exacerbation of their challenges.

4.3 Research design

Figure 4.1 illustrates the differentiated roles of national, provincial, and local state actors in mega-regional governance. Provincial state actors occupy an intermediate stage, which does not entail the entire process of transferring national visions to local implementation. Rather, it specifically refers to the role of provincial governments as mega-regional coordinators, operationalizing national visions into short-term and concrete arrangements, thereby directing the actions of local state actors (municipalities). These short-term arrangements are generalized in a series of action plans, which are not necessarily official planning documents, but can be regarded as a collection of actions adopted by coordinators to (re) position secondary cities within mega-regional coordination. Therefore, we chose to investigate **provincial government reports**, which tend to detail the coordinator's specific arrangements and actions in a given year and the preferred responses to secondary city challenges, in response to national planning guidelines. These reports are valuable research sources because present the coordinators' real intentions and short-term priorities for mega-regionalization. In addition, their constant frequency helps build a storyline to identify the repositioning trends of secondary cities over time.

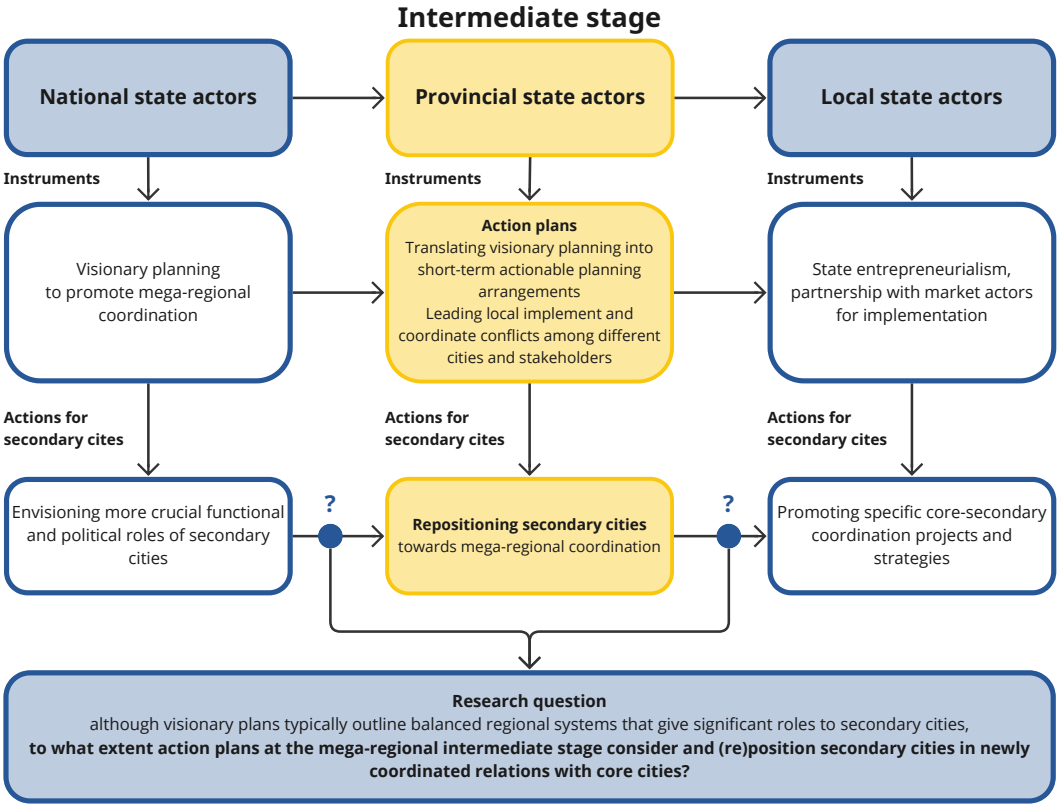

FIG. 4.1 Conceptual framework of the intermediate stage of state spatial selectivity

4.3.1 Case selection

In China, mega-regions reflect the preferred regional spatial distribution of state authorities (Zhang et al., 2025). Although these mega-regions are not so different from each other on the map, they vary in terms of stage of development, political positioning, and internal connections (Harrison & Gu, 2021). Thus, the authorities set various goals, categorizing them into three development stages, namely “optimizing”, “further growing”, and “initially cultivating” (CNDRC, 2021), partly in line with reflections on their functional coherence, recently categorized as “imagined”, “emerging”, and “real” mega-regions (Wang & Meijers, 2024).

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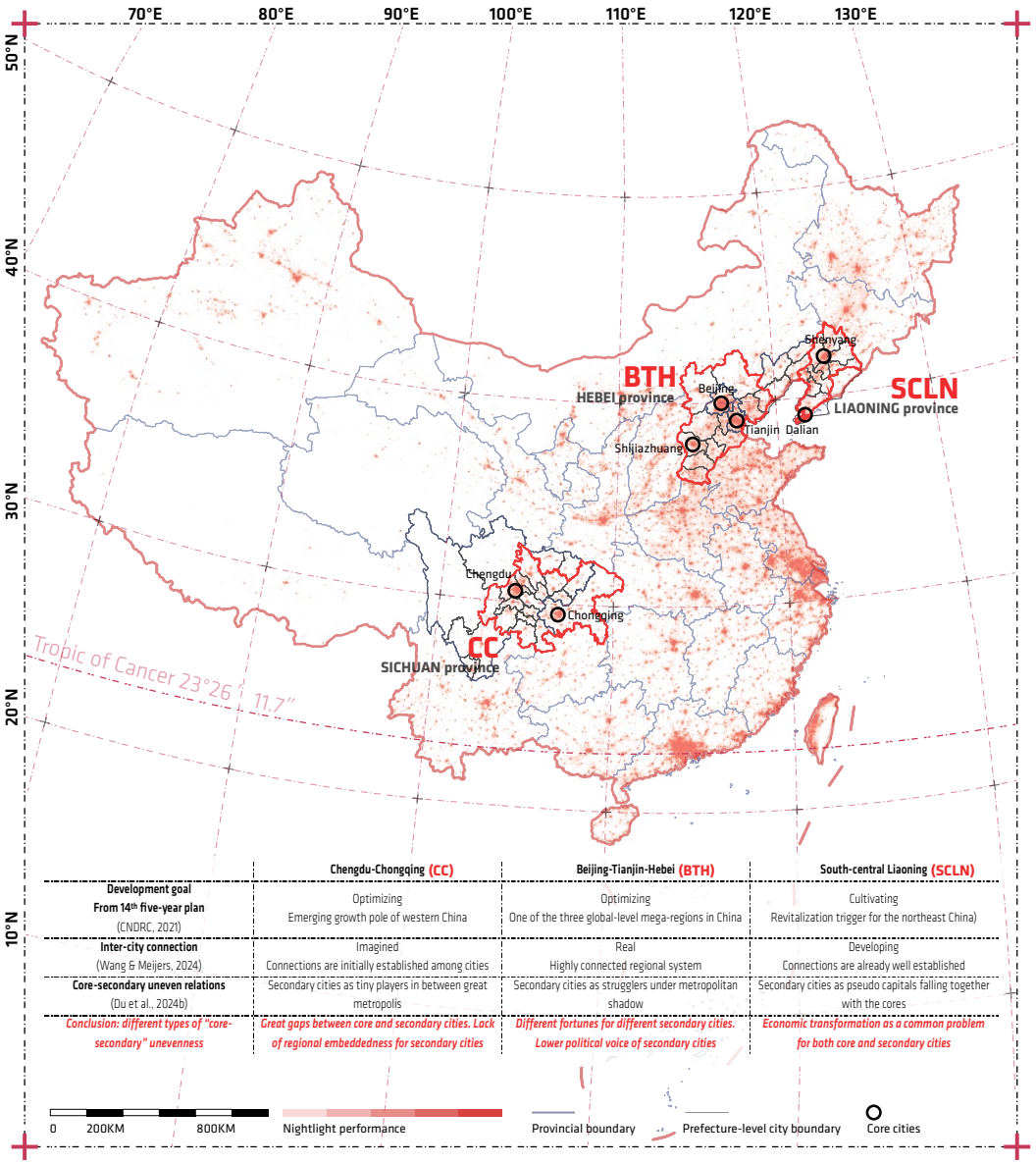
Within these mega-regional conditions, Du et al. (2024b) defined a novel typology of secondary cities from the perspective of the development disparities with their respective cores. Since this typology is based on distinctive types of uneven spatial relations between core and secondary cities, we employ it here to select three representative mega-regions: Chengdu-Chongqing, Beijing-Tianjin-Hebei, and South-central Liaoning (Figure 4.2).

- **Large metropolises vs. tiny players:** The Chengdu-Chongqing mega-region (CC), as an emerging growth pole in Western China, is most notably characterized by two giant cores surrounded by comparatively small secondary cities. The mega-region consists of 14 secondary cities belonging to Sichuan province. The core city of Chengdu is a sub-provincial city (a higher administrative level than ordinary cities) and the provincial capital, and Chongqing is a centrally administered municipality (the highest administrative level, of which there are only four cities).

- **Secondary cities under the metropolitan shadow:** The Beijing-Tianjin-Hebei mega-region (BTH) consists of 10 secondary cities belonging to Hebei province, and three core cities. Beijing and Tianjin, both centrally administered municipalities, play a central role in the mega-region. Shijiazhuang, the capital of Hebei province, is economically less developed than the other mega-regional cores. Although this mega-region is often regarded as one of the most developed in China, the inherent disparities and the unbalanced political influence have left the secondary cities under a so-called metropolitan shadow (Li & Jonas, 2023). Despite being classified (relationally) as secondary cities, they can be demographically large, unlike their CC counterparts, with some exceeding ten million inhabitants in the whole municipal area.

- **Weak core vs. weaker secondary cities:** The South-Central Liaoning mega-region (SCLN) is the only mega-region in the study that is not inter-provincial, with 11 cities, including the two core cities, inside Liaoning province. Shenyang is a sub-provincial city and the provincial capital, and Dalian is a sub-provincial city. This mega-region is relatively underdeveloped: it was an important heavy industry hub in the past but has faced severe transformation obstacles in recent years. Also, the core cities have been questioned for their inability to support the overall region (Zhao & Yin, 2019).



	Chengdu-Chongqing (CC)	Beijing-Tianjin-Hebei (BTH)	South-central Liaoning (SCLN)
Development goal From 14th five-year plan (CNDRC, 2021)	Optimizing Emerging growth pole of western China	Optimizing One of the three global-level mega-regions in China	Cultivating Revitalization trigger for the northeast China)
Inter-city connection (Wang & Meijers, 2024)	Imagined Connections are initially established among cities	Real Highly connected regional system	Developing Connections are already well established
Core-secondary uneven relations (Du et al., 2024b)	Secondary cities as tiny players in between great metropolis	Secondary cities as strugglers under metropolitan shadow	Secondary cities as pseudo capitals falling together with the cores
Conclusion: different types of "core-secondary" unevenness	*Great gaps between core and secondary cities. Lack of regional embeddedness for secondary cities*	*Different fortunes for different secondary cities. Lower political voice of secondary cities*	*Economic transformation as a common problem for both core and secondary cities*

FIG. 4.2 Three mega-regions in the Chinese urban system

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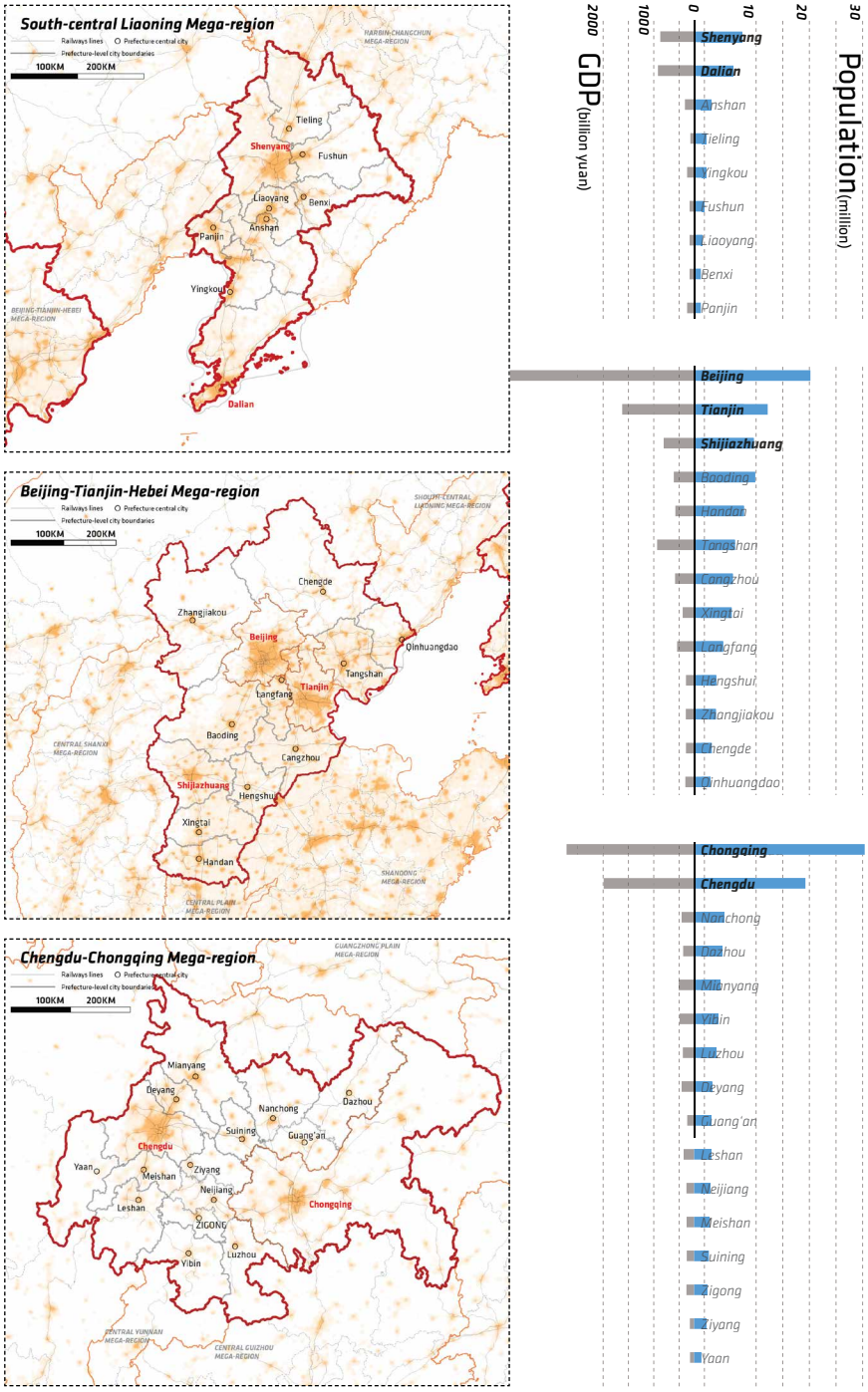

FIG. 4.3 Metropolitan structure within mega-regional system

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4.3.2 Policy analysis based on historical institutionalism

Following the case selection, we collect provincial government reports corresponding to the secondary cities in each mega-region over a period of 19 years (from 2006, when the central government first identified mega-regions as the main future urbanization scale, to 2024) with a total text data of nearly 1.05 million Chinese characters. Given the scale of the dataset, selecting an appropriate analytical tool is crucial. Our study aims to explore (i) the trends of the action plans in repositioning secondary cities, (ii) the consistency of the main coordination mechanisms, and (iii) the difficulties of responding to secondary city challenges. Therefore, we do not restrict to conventional textual analysis methods. Instead, we draw on **historical institutionalism** to go beyond static semantic policy interpretation. Here, institutions are interpreted as "distributional instruments" of political resources (Mahoney & Thelen, 2009), which aligns closely with the function of mega-regional coordinators responsible for integrating secondary cities into mega-regional coordination. This enables us to emphasize how, through these action plans, the coordinators' roles, attitudes and actions toward secondary cities have been changed, layered, and reinforced over time.

As one of the core analytical approaches of new institutionalism, historical institutionalism emphasizes "*political process structured by … political institutions, state structures, … policy networks, contingencies of timing*" (Immergut, 1998, 18). The framework has been widely recognized in European spatial governance literature and applied to explore planning transitions, critical junctures, and actor configurations (Dąbrowski & Lingua, 2018). It has also been gradually adopted in other geopolitical contexts, such as analyzing the institutional embedding of public participation in Chinese urban regeneration (Ye et al., 2024). Historical institutionalism focuses on the dynamic, temporal, and evolutionary nature of governance processes. Compared with rational choice institutionalism, driven by neoclassical economic models of rational actor behavior, or social institutionalism, shaped by cognitive frames and social norms (Sorensen, 2017), the historical perspective allows us to trace shifting policy orientations and the evolving functional roles of state actors across different stages. This resonates with the understanding of mega-regionalization as a gradual and adaptive governance process. By incorporating the temporal lens, we can better identify key nodes of institutional change, examine how mega-regional coordinators formulate and adjust their action plans, and reveal their political intentions. We built our analytical framework based on the three components proposed by Sorensen (2015):

- **Path dependency** is the most fundamental perspective we employ to understand the institutional continuity and the changes (or reforms) in the process of mega-regionalization as coordinators adjust, optimize, and revise action plans. Although the current institutional pathways may not be the best choice, their continuity can be enhanced by positive feedback from the beneficiaries of this path (Pierson, 2004). This leads us to reflect on the changing ways of distributing political resources through action plans, either supporting or threatening the positions of secondary cities.

- The **identification of critical junctures** means *major* institutional transformation (Capoccia & Kelemen, 2007), referring to "*the moments when new sets of institutional arrangements are established, …, when the rules of the game are changed*" (Sorensen, 2015, 25). In our case, such moments can be the reforms in the vision of mega-regionalization and related political initiatives. This helps us to cut the long-term timeline into different periods, allowing a more specific characterization of the repositioning process of secondary cities.

- Finally, **incremental and endogenous change** underlines gradual institutional changes at the endogenous level of the institutional receivers, including adaptive changes mobilized by those advantaged by the institution to defend their interests in the institutional implementation process (Sorensen, 2015). The variability of compliance with (vague) institutional rules leads to changes in implementation directions, even though there have been no changes in official institutional decision-making (Mahoney & Thelen, 2009). In our case, this could potentially explain whether, under the broad framework of mega-regional coordination, the coordinators pursue different objectives, thus revealing their underlying political intentions.

  We code the contents of policy documents and identify their temporal-spatial characteristics regarding secondary cities through periodic mapping. To this end, we employ a three-step approach. We begin by constructing a longitudinal text corpus of provincial governmental reports. Each sentence is manually reviewed and coded based on the 3-CO framework explained above. The coding process not only filters the content but also sharpens the focus on meaningful expressions of policy coordination between core and secondary cities. This step transforms original content into structured, analyzable political narratives. Building on the labeled data, we analyze the evolution of mega-regional coordination through the three interpretive lenses of historical institutionalism to identify overarching trends and continuities, and key turning points in mega-regional action plans, reflecting the coordinators' evolving preferences and political intentions (Figure 4.4). The outputs of this step are systematically visualized through mapping (see Appendix) that allows us to simultaneously view trends, ruptures, and inconsistencies in secondary

cities' repositioning processes. In the final step, the mapped trajectories are used to revisit the research question by synthesizing how mega-regional action plans reflect institutional arrangements, selective adaptations, or purposeful inclusion of secondary cities.

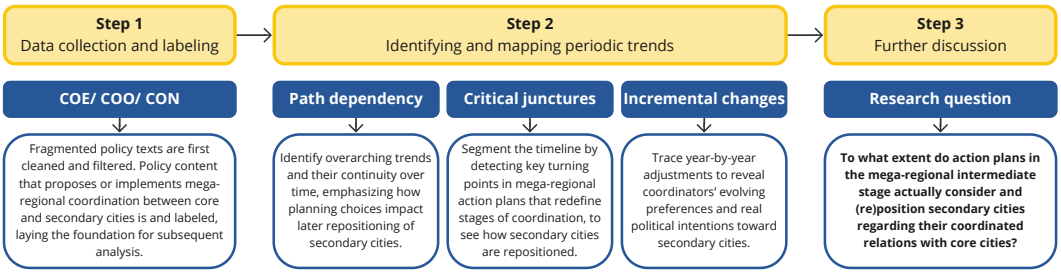

FIG. 4.4 Research design

4.4 Secondary cities repositioning in provincial action plans: the periodic trends

Based on this analytical framework, we first present the periodic trends. Identifying critical junctures is the main criterion for the division of stages. These critical junctures are often constituted by ideological shifts of spatial planning (e.g. from prioritizing growth poles to balancing the overall regional system), transitions in regional spatial development direction and structure (often accompanied by the launching of new plans or policies in line with the political orientations from the national authorities), and significant spatial interventions. Drawing on the historical institutionalism framework, we examine how secondary cities have been (re) positioned by mega-regional coordinators over time through successive action plans. On one hand, we highlight path dependencies reinforced by positive feedback mechanisms, such as economic profitability or previous spatial development paradigms. On the other hand, the temporal sequencing of these action plans enables us to trace the incremental evolution of spatial interventions and uncover their cumulative implications for secondary cities (Table 4.1).

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Due to inter-city disparities, the spatial selectivity process in the Chengdu-Chongqing mega-region is reflected in two aims for secondary cities: mobilizing and accommodating them to alleviate the disparity, and integrating them in the larger system to consolidate the mega-regional status as the leading growth pole in Western China (see Appendix). Since the first stage of mega-regionalization, the coordinators employ metropolization to promote the integration of Chengdu and its neighboring secondary cities towards a stronger national core, while managing both competition and cooperation relationships with Chongqing (the core outside the province). However, up to 2018 (the end of stage III), this had only achieved the objective of strengthening the core. Especially when Tianfu New District was recognized by the central government as the expanded functional area of the core in stage III, it became a facilitator for Chengdu to become a global city instead of a new platform for core-secondary cooperation. Only after the official mega-regional plan issued in 2018 and the concept of one backbone (with Chengdu as the core) and multiple branches (with secondary cities playing more significant roles), put forward in 2019, were secondary cities valued once again. Besides continuing to highlight Chengdu's driving force for its neighboring cities, some adjacent secondary cities outside the Chengdu metropolitan area were encouraged to integrate as mega-regional sub-centers. Finally, Chongqing became interested in welcoming secondary cities by working together on inter-provincial industrial cooperation projects, co-managing administrative affairs, sharing public resources, and promoting cultural and tourism exchanges in the last stage.

In the Beijing-Tianjin-Hebei mega-region, Hebei province experiences a significant development disparity compared to the two global cities. Therefore, utilizing the resources of both "superstars" is an initial consideration when repositioning secondary cities. From Stage I, the coastal area was prioritized and received two responsibilities: to attract resources from the cores and to provide support for the inland cities, namely access to the seaports. The official plan initiated by the top authorities has successfully mobilized Beijing and Tianjin in Stage III and led to a blossoming of innovative cooperation, industry relocation, and service sharing between core and secondary cities. However, these core-secondary cooperative actions are gradually concentrating on only a few cities. This is because one of the most important motivations for the central government's advocacy of mega-regionalization was to promote the decentralization of Beijing's urban functions by transferring social services and low-end industries to cities in Hebei province. The establishment of the Xiong'an New Area in 2018 centralized this process around this emerging territory, which has been described as a national project of millennial significance (Zou & Zhao, 2018). In fact, the Xiong'an New Area can be seen as a spatial extension of Beijing's functional area, as it was designated to absorb overcrowded industries, enterprises, institutions, and service facilities relocated from the national capital.

TABLE 4.1 Different stages of repositioning secondary cities over time and critical junctures

	Stage I	Critical junctures	Stage II	Critical junctures
Chengdu-Chongqing	**2006-2011 Framing integrated industrial clusters lead by Chengdu** • Prioritize Chengdu, as the driving force of secondary cities, to counter the strong competitiveness of Chongqing • Chengdu plain city group as the first step of metropolization emphasizing industrial cooperation • Inter-provincial cooperation between two cores were envisioned	**The approval of the mega-regional plan for the Chengdu-Chongqing Economic Zone by the national authorities, the formalization and new stage of institutionalization**	**2012-2014 Planning greater mega-region in the name of Chengdu-Chongqing Economic Zone Critical** • Consolidate leading role of Chengdu through metropolization together with neighboring secondary cities • Establish Tianfu new area to expand development space of Chengdu • Five development axes to strengthen the linkages between the two cores and the secondary cities in between	**The designation of Chengdu as a national central city and the elevation of Tianfu New Area to a national-level strategic zone, aiming at reinforcing Chengdu's centrality within the mega-region**
Beijing-Tianjin-Hebei	**2006-2010 Prioritizing costal area around national capital** • Establish costal industrial zones, connecting and supporting inland area • Encourage cities around Beijing and Tianjin to improve endogenous capacity to absorb resources from the two "superstars"	**Introducing the concept of "Economic Circle around the National Capital", expanding the focus of development from coastal to inland regions**	**2011-2013 Engaging more secondary cities to national-level development strategies** • Introduce the concept of Economic circle around Beijing • Both Costal area and south-central Hebei became national-level priority areas for development to attract functional relocation from Beijing and Tianjin	**Cooperation projects between secondary cities and Beijing were widely advocated, and the official approval of the Beijing-Tianjin-Hebei Cooperative Development Outline by national authorities**
South-central Liaoning	**2006-2008 Leading secondary cities by the two cores** • Integrate cities neighboring Shenyang towards metropolization • "Five nodes along one belt" linking Dalian and other costal secondary cities	**Establishing Shenyang Economic Zone as the formalization of aggressive metropolization**	**2009-2014 Aggressive metropolization** • Envision world-class metropolitan area as a new coastal growth pole • 42 new towns and 61 industrial parks were planned in the Shenyang Economic Zone • 42 industrial parks were planned in the Coastal Economic Zone facing the market in northeast Asia	**A shift from aggressive metropolitan expansion to targeted core-secondary integration with Fushun, mobilizing external resources by enhancing connectivity with Beijing**

	Stage III	Critical junctures	Stage IV
Chengdu-Chongqing	**2015-2018 Increasing priority to Chengdu, less consideration for secondary cities** • Turn Chengdu into a national central city, form twin global city system with Chongqing • Promote Tianfu new area as a national-level development zone with a new global airport • Link two cores with high speed railways	**In response to the challenge of unevenness, the provincial government began promoting a planning ideology of "one backbone, multiple branches"**	**2019-today Bringing back secondary cities through Chengdu's metroplization** • Continue metropolization of Chengdu, planning approved by central government • Integrate development between secondary cities to act as regional sub-centers • Core-secondary partnerships in the form of territorialized industrial spaces • Intensity high speed railways connection between core and secondary cities
Beijing-Tianjin-Hebei	**2014-2017 Operationalizing core-secondary cooperation** • Promoting mega-regionalization from the top authorities: BTH Cooperative Development Outline • Beijing's non-capital functions decentralization as key task required by the authorities	**Core-secondary coordination condensed into three national-level flagship projects, marking most notably by the establishment of the Xiong'an New Area**	**2018-today Concentrating focus on several specific secondary cities** • Set up Xiong'an New Area as target area for Beijing's functional relocation • Co-host winter Olympics with Beijing and development sport industries in Zhangjiakou • Integrate into Beijing to form sub-center of national capital in northern counties of Langfang
South-central Liaoning	**2015-2020 Seeking external resource rather than promoting mega-regionalization aggressively** • Shenyang-Fushun integration • Dalian as the trade hub towards international market • Beijing-Shenyang high-speed railway as the most important connectivity action • Industrial upgrading in west Liaoning to attract resource from Beijing	**Reframing metropolization in the name of "Shenyang Modernized Metropolitan Area"**	**2021-today Re-emphasizing mega-regionalization** • Set up Shenyang Modernized Metropolitan Area as growth pole of northeastern China • Dalian together with costal secondary cities towards global market

Although Xiong'an is administratively part of the secondary city of Baoding, the external resources it has attracted have not spilled over into the rest of the city; instead, it functions more like a "functional enclave" of Beijing (Meng et al., 2017). Other secondary cities, by contrast, are even further peripheralized. This was considered one of three major political tasks in the mega-regional action plans, and the selected cities that are more closely anchored to Beijing have clearly gained more resources (see Appendix).

South-central Liaoning faces the ongoing challenge of industrial restructuring, resulting in a relatively low level of economic growth (Zhao & Yin, 2019). Therefore, searching for more promising development paths is a crucial concern for the coordinators. The secondary cities were divided into two groups from stage I: inland cities around Shenyang to form a metropolitan area, and a coastal city belt centered on Dalian (see Appendix). According to this fundamental structure, the coordinators initiated aggressive metropolization efforts, establishing several new towns and industrial parks as the spatial basis for mega-regional development in the second stage. These action plans were soon considered impractical and did not address the challenges of regional economic decline. Therefore, in the third stage, which started in 2015, only "Shenyang-Fushun integration" was mentioned as a regional coordination driver, while other secondary cities and related new towns were no longer mentioned as a priority. The coordinators strived for open trade hubs, turning seeking more external resources into a major task. On one hand, they expected that links with other mega-regions would bring more opportunities for industrial transformation. On the other hand, the efforts of the coastal cities to seek broader global markets have continued. In this way, secondary cities explored new industries and promoted economic transformation by secondary cities by themselves.

To summarize, mega-regional coordinators adjusted the direction of spatial selectivity at critical junctures in response to the challenges of secondary cities but most of their action plans were insufficient in later stages. Aspects of path dependency are often present in the coordinators' initial motivation for mega-regionalization, including considerations of persistent disparities, the demand for new growth poles and cooperation with neighboring big cities, and industrial transformation. These initial motivations sometimes determine the coordinators' desire for positive feedback on specific aspects of the plans, even if secondary city challenges do not necessarily stay in focus across all stages. Additionally, incremental and endogenous changes also play a role in reinforcing path dependency to satisfy short-term interests. For example, the authorities set the requirements for regional development leadership of the cores, and the action plans tend to cover secondary cities at the beginning. However, we find that all three mega-regions gradually fall into the path of only reinforcing the cores at later stages.

4.5 Consistent mechanisms of spatial selectivity

Over the past 19 years, Chinese mega-regions, as the primary scale of state spatial selectivity, have seen limited reforms regarding the mechanisms to deal with secondary city challenges. This reflects the consequences of path dependency in spatial selectivity mechanisms, which operationalize the national policy orientations of coexistence, connectivity and cooperation as structuring principles of core-secondary relations (Figure 4.5). For coexistence, determining spatial-economic configurations is a key mechanism, focusing on specific regional spatial arrangements, including economic development axes and a corresponding program of division of labor across core and secondary cities. For cooperation, redistributing urban functions is the most significant mechanism to promote beneficial interactions. This allows secondary cities to be repositioned into new and complementary functional roles, including new industries and various social resources. Connectivity supports the first two mechanisms, promoting the optimization of the spatial structure and inter-city interactions through enhanced regional accessibility. Coordinators, in practice provincial state actors, follow a simple strategy, based on strengthening the transportation infrastructure, according to the overall spatial configuration and the planned redistribution of functional clusters.

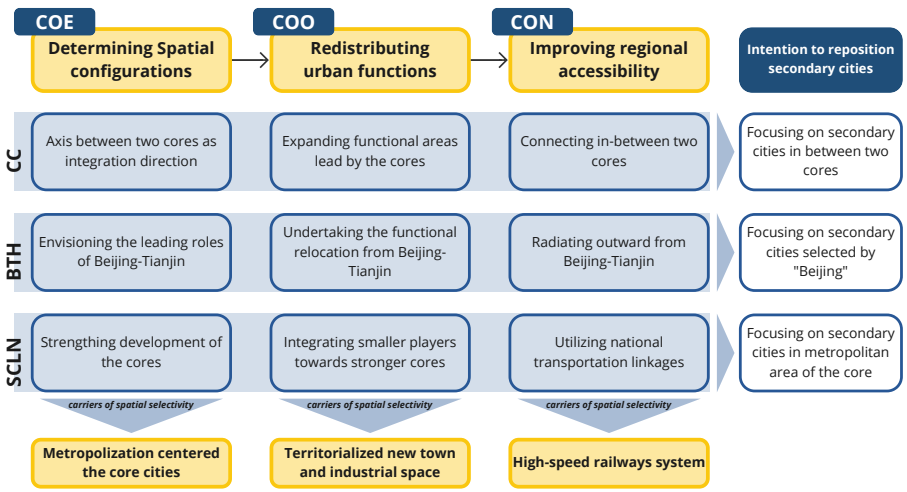

FIG. 4.5 Main mechanisms of spatial selectivity in different mega-regions

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Although controlled by the coordinated initiatives of authorities and the turnover of critical junctures, these three mechanisms show strong continuity in almost all stages of the selected mega-regions. This may be because the coordinators receive positive feedback on them in their efforts towards a more balanced mega-regional system: polycentric spatial configurations, complementary distribution of urban functions, and closer infrastructure bonds have been proven to bring opportunities to secondary cities.

However, we also see that these mechanisms have been "adaptively reformed", i.e., implemented with incremental and endogenous changes, to achieve the short-term preferences of the coordinators. Regarding spatial configurations, metropolization around the cores is often the focus. This often materializes as integration axes connecting core and secondary cities nearby, or expansion of the cores' leading roles in supporting other smaller players. Such approaches are mostly dominated by core city interests. For example, in Beijing-Tianjin-Hebei, secondary cities are less favored because the two main cores are not in the same province. Since the Hebei provincial government has no control over them when implementing specific actions, the cities adjacent to Beijing are more likely to get preference. Therefore, the provincial state actors actively try to get the attention of the top authorities to legalize the various action plans through national policies or plans, hoping for more support.

Regarding the redistribution of urban functions, transferring industries, innovation and technologies, and public resources from the cores to secondary cities through new towns and industrial areas is a favored approach. In Chengdu-Chongqing, functional mobility is reflected in industrial parks along various spatial corridors, stemming from a spontaneous process of industrial alliance formation between core and secondary cities under the initiative of the coordinator. In Beijing-Tianjin-Hebei, there is a stronger political imperative, as Beijing is increasingly overcrowded and required by the authorities to decentralize its urban functions to Hebei. This has effectively accelerated the process of neighboring cities receiving industries, investments, and other development resources. However, the establishment of Xiong'an New Area has largely concentrated the functional diffusion in a single axis, and other secondary cities are peripheralized. As for South-central Liaoning, the cores lack leading capacity, their secondary cities need to independently seek development opportunities, making it challenging to promote mega-regionalization.

Improving regional accessibility is the infrastructural basis for realizing spatial integration and functional redistribution. In Chengdu-Chongqing, this is centered on metropolitan connections around Chengdu and high-speed transportation corridors between two cores. In Beijing-Tianjin-Hebei, transport links radiate outward from Beijing, driven by major action plans. South-central Liaoning focuses on extending higher-scale

(national) connectivity networks, such as Beijing–Shenyang, and Harbin–Changchun–Shenyang–Dalian (a high-speed rail system between major cities in Northeast China).

These adaptive changes initiated by the intermediate stage coordinators can be the neglected reason why spatial selectivity mechanisms fail to respond to the secondary city challenges in Chinese mega-regionalization. Although they seem promising to benefit secondary cities, coordinators gradually move the materialization of the action plans towards certain intentions: all mega-regions prefer stronger cores, and smaller neighbors can benefit more from targeted spatial selectivity mechanisms when they are selected by the cores. This is also a consequence of path dependency guided by positive feedback: prioritizing the cores increases the overall socio-economic strength and competitiveness of the mega-region, and thus becomes the primary goal of the coordinators. Balancing inter-city disparities is only reflected in the success of a few selected secondary cities.

4.6 Reflecting on contradictions in repositioning secondary cities

Chinese mega-regions, as main carriers of state spatial selectivity, have been further restructured by provincial state actors acting as coordinators of an "intermediate stage" of mega-regionalization based on action plans, regardless of the visions drawn by the top authorities. This includes refining action plans by extending transformative visions and initiatives that appear at key moments (critical junctures), building on positive feedback on their initial intentions by maintaining specific strategies (path dependency), and making adaptive changes towards certain interests and preferences, usually in alignment with core city interests (incremental and endogenous changes). These adjustments do not necessarily focus on the challenges of secondary cities. They are rather a trade-off between the strategic directions of prioritizing the cores for greater regional growth and emphasizing inter-city coordination to address unevenness problems. However, "… *(the institutional) continuity is often the result of ongoing mobilization by those advantaged by the institution who seek to protect their advantages*" (Sorensen, 2015). This also perpetuates coordinators and core cities as advantaged stakeholders dominating the adaptive change process of the action plans, causing contradictions between these and the visions.

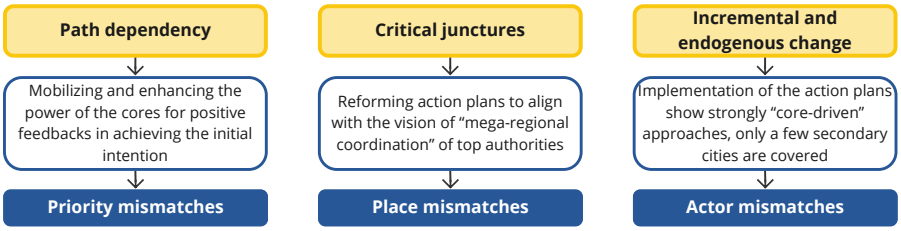

FIG. 4.6 Governance mismatches

This aligns with the governance mismatches suggested by Du et al. (2024a) to explain the practical struggles secondary cities face between planning initiatives and implementation in Chinese mega-regionalization (Figure 4.6). First, core cities continue to act as engines of regional growth, while also being expected to drive the development of their smaller neighbors. Indeed, they strengthen the overall competitiveness of the mega-region, at least in terms of GDP statistics, without risking more serious threats of decline, such as the loss of labor, investment, and technology (Zhou & Yang, 2024). This positive feedback reinforces the continuity of prioritizing core cities in mega-regional action plans. This is conceptualized as a **priority mismatch**, as the coordinator's initial intentions changes to building stronger rather than more balanced mega-regions. We do not intend to discourage such an approach, as the current model of mega-regions would not work without strong cores as leaders. This is clear, for example, in Beijing-Tianjin-Hebei, where the secondary cities in south-central Hebei are not well integrated because they are too far from the real cores, and Shijiazhuang does not have the capacity to lead closer relations with the secondary cities. However, as mentioned above, path dependent solutions are not necessarily optimal, so we expect emerging visions that include secondary cities in a more productive way.

Second, as the decision-makers of mega-regional visions, the national authorities have always focused on secondary cities in successive policy orientations. Therefore, when critical junctures shift, action plans tend to similarly re-initiate more balanced development directions in secondary cities to align with the top vision. However, these initiatives are often not efficient and lasting, which can be attributed to a **place mismatch**: in the face of opportunity, the endogenous strengths of secondary cities are insufficient to allow them to integrate into, and benefit from, mega-regionalization as the required conditions do not align with their capacities. For example, although the action plans in Chengdu-Chongqing highlight the role of secondary cities in industrial cooperation, their small size and low development level limit investment attraction and the accommodation of emerging industrial clusters (Zeng & Zhang, 2019).

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Finally, incremental and endogenous changes based on the broad framework of mega-regional coordination gradually direct the vision of re-balancing towards re-prioritizing the cores, reinforcing path dependency. Apparently, the promoters of these adaptive changes are the beneficiaries of this path, i.e., the coordinators and the core cities. In contrast, secondary cities do not have enough political voice to influence their repositioning in the mega-regionalization process, and overall coordination is more dependent on the willingness of the core cities, especially when they are outside the province and not under the supervision of coordinators. Beijing and Chongqing, for example, took mega-regionalization seriously and showed their willingness to participate in coordination only at a very late stage. Only a few secondary cities have opportunities to benefit from the repositioning process, and those not favored by the cores are more likely to struggle. This can be conceptualized in Du et al. framework (2024a) as an **actor mismatch**. Indeed, action plans are institutional mechanisms in which power disparities between different state actors lead to adaptive changes that ultimately hinder realizing a more balanced vision.

4.7 Discussion and conclusion: left behind secondary cities in the spatial selectivity process

In our study, Chinese mega-regionalization, as the primary way to operationalize state spatial selectivity, is hypothesized to have an “intermediate stage”, managed by coordinators at the provincial level, whose mismatches with the vision of national authorities could help explain the failure to alleviate the secondary city challenges of polarization and peripheralization. Such an intermediate stage is translated in action plans that exhibits periodic trend variations across different types of mega-region, but consistently employs three key mechanisms: determining spatial configurations, redistributing urban functions, and improving regional accessibility (Figure 4.5). These mechanisms work together to develop axes of intense spatial integration, decentralize functions from cores to peripheries, and create new mega-regional sub-centers, beneficially repositioning some secondary cities along the process but leaving behind others to seek their paths of support and transformation.

This process, in the form of action plans, explains why responding to the challenges of secondary cities facing mega-regional unevenness is difficult. Action plans tend to reinforce unequal core-secondary spatial relations due to the over-dependence on core city interests. Although critical junctures often begin with plans that suggest strategies to benefit secondary cities, adaptive changes dominated by core cities and aligned with the biases of coordinators lead the implementation process back to a path of dependency on a strong core (Figure 4.5). This narrowing down of the available paths for secondary cities represents a blind spot of mega-regionalization, and most secondary cities are left behind.

In the current literature, left behind cities are those have been marginalized from the economic mainstream under state-led macroeconomic policies, which have systematically benefited certain cities and regions while excluding others (Fiorentino et al., 2024). In this sense, secondary cities are clearly "left behind" under mega-regionalization, which functions as a form of state spatial selectivity privileging certain cores and a small group of secondary cities. Compared with the dominant cores, secondary cities are disadvantaged in the political mindset of mega-regional coordinators, as consistently demonstrated in our three mega-regional cases where the cores are always prioritized. However, the fate of secondary cities also diverges. A small group of "fortunate" cities are selectively integrated into major mega-regional projects, by being either chosen by state policies or incorporated into the development strategies of their cores, thereby gaining greater access to resources and opportunities. Yet, most secondary cities remain unable to capture substantial benefits from mega-regionalization.

From a global perspective, core-secondary spatial relations are often identified as key factors of left-behindness, for example, in the case of knowledge- and technology-intensive industries and advanced services concentrated in the cores that weaken the economic vitality and employment opportunities of traditional manufacturing cities in Western countries (Fiorentino et al., 2024; MacKinnon et al., 2022). The policy debates on addressing this increasing polarization include redefining the development goals of these cities based on an endogenous approach to alternative areas like health and new industries (MacKinnon et al., 2022), and reflecting on the financial and political precedence they should receive based on the state redistributive power (Dijkstra, 2024). Other discussions explore the beneficial externalities of regional networks for these cities, including the integration of smaller cities into larger systems in some European countries, and inter-city cooperation based on suitable cross-regional functional spread and absorptive capacity (Cardoso & Meijers, 2016).

This problem has been responded to in European countries with initiatives of "regional polycentricity" (Meijers & Cardoso, 2021), but contextual differences make Chinese mega-regionalization difficult to implement. Unlike the Dutch Randstad or the German Rhein-Ruhr region, Chinese "polycentricity" is only a vision rather than an actual spatial and functional network in almost all mega-regions. The authorities intend to foster the formation of such balanced regional spatial structures, but scholars have also found that this is currently limited to infrastructural linkages (Harrison & Gu, 2021), while broader market and socio-economic interactions are difficult to achieve and have even led to greater polarization of secondary cities (Huang & Zong, 2021). Besides, scale and size are also issues to be considered: Chinese mega-regional planning shows unrealistic ambitions. The excessive scale of mega-regions makes it difficult for policy orientations towards coexistence, connectivity, and cooperation between cities to work in practice and benefit secondary cities.

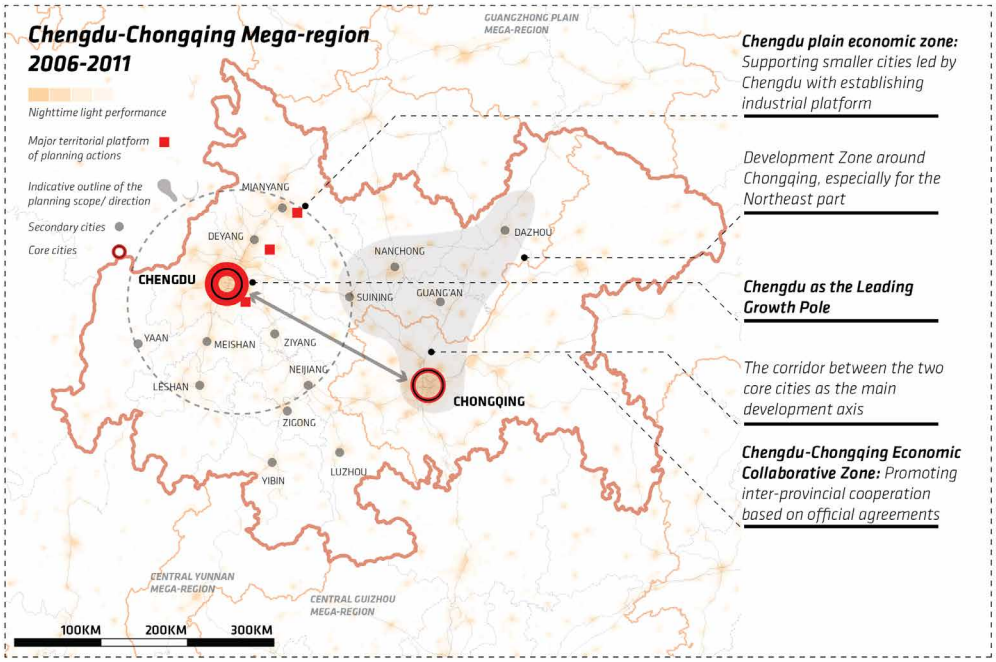
Driven by path dependency, critical junctures, and incremental and endogenous changes, institutional mismatches at the level of priorities, places, and actors also hinder mega-regionalization from reaching a coordinated vision between core and secondary cities. Chinese scholars have dissected this issue to some extent. Zhou (2007), for example, argues that regional development in China is strongly associated with the pursuit of GDP growth by government officials as it significantly affects their career promotion. This further emphasizes the role of the regional cores as economic pillars. After nearly two decades of mega-regionalization, despite the desire of the authorities to control the power of the regional cores and encourage the sub-cores (often the more developed secondary cities) to take on more responsibilities (CNDRC, 2023), the coordinators are still unwilling to give up their ambition to achieve fast GDP growth, and prefer the strategy of strengthening provincial capitals (Zhou & Yang, 2024).

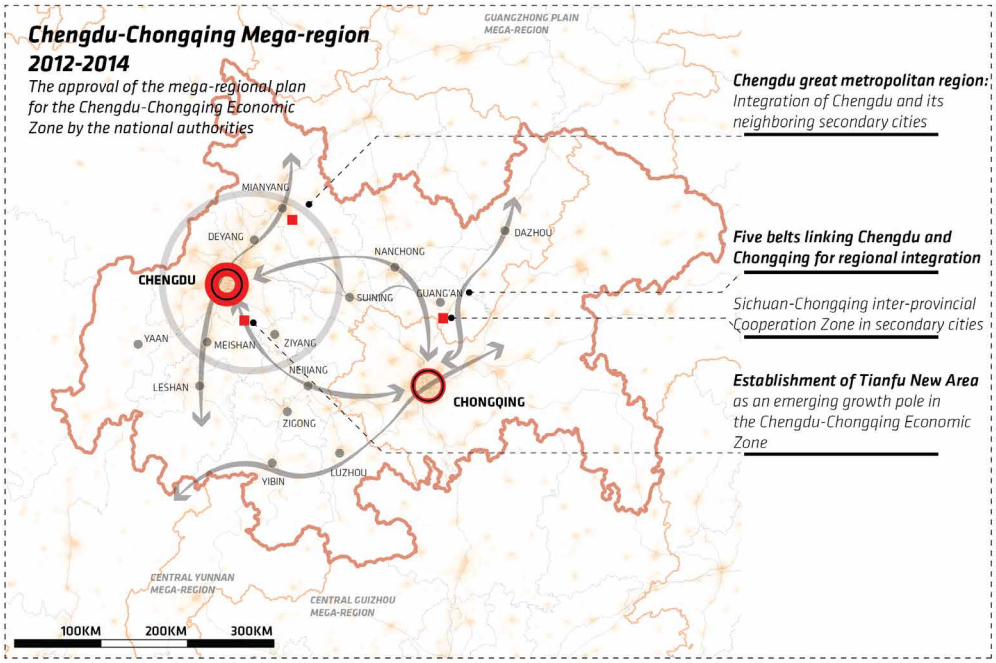
Our paper shows that in Chinese mega-regionalization, left-behindness is reflected in some secondary cities being neglected in the mega-regional repositioning process, making their integration into the regional system remain an imaginary planning vision. Action plan coordinators are often stuck in the dilemma of prioritizing cores as growth engines or rebalancing the regional system to include (all) secondary cities. Our study expands the theoretical horizon of state spatial selectivity as a concept for mega-regional studies and uncovers the neglected role of the intermediate stage between the central authorities' initiatives, and local-scale planning implementations. Action plans based on the coordination of core-secondary spatial relations are indeed an important part of the spatial selectivity process, as they may trigger conflicts between priorities, places, and actors that potentially result in greater threats to secondary cities. In practice, this finding

provides analytical tools for a deeper exploration of specific practices through which left behind secondary cities have responded (in)efficiently to polarization and peripheralization and have been (un)able to integrate into and benefit from regional networks, such as the rise and fall of industrial new towns or other spatial platforms intended to promote core-secondary cooperation. We also provide insights for action plan coordinators to reflect on secondary city challenges and more suitable target policies, which appropriately connect the vision and the implementation levels – e.g. whether the type of industries and services that are spatially redistributed makes a difference, or whether merging smaller cities brings greater network benefits, among other possibilities (Cardoso & Meijers, 2016). Importantly, coordinators responsible for translating planning visions into practice should adjust their action plans in search of beneficial core-secondary spatial relations guided by a vision of alleviating intra-regional unevenness.

Appendix

Note: The following mapping is a conceptual illustration of major strategies of mega-regional action plans. We aim to convey the general direction and evolution of development directions, and does not represent precise geographic scope or locations.





Conceptual illustration of key strategies in action plans across different stages of mega-regionalization - Chengdu-Chongqing mega-region

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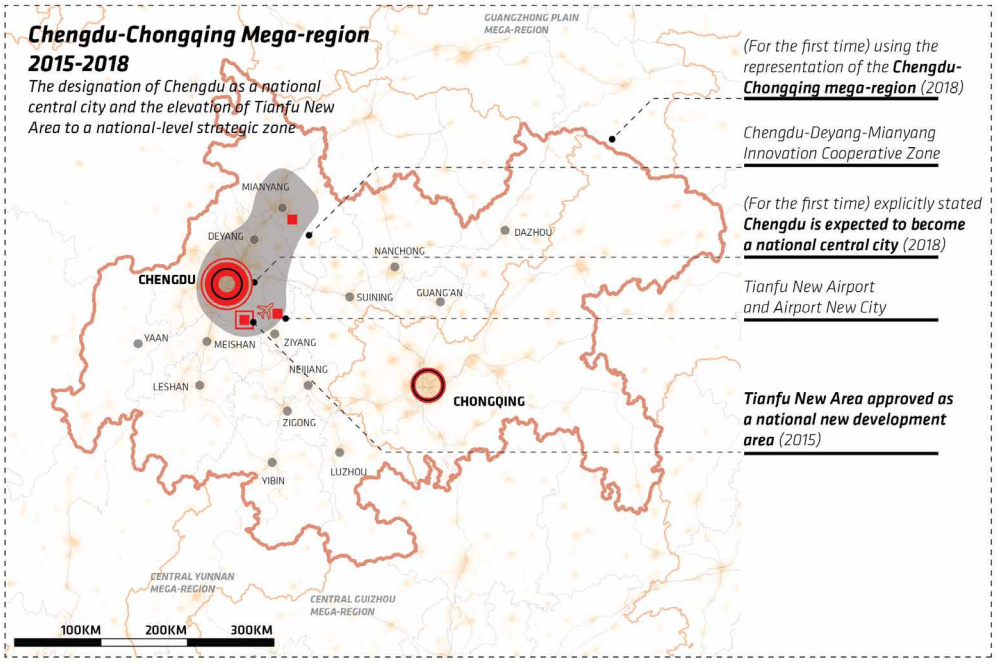

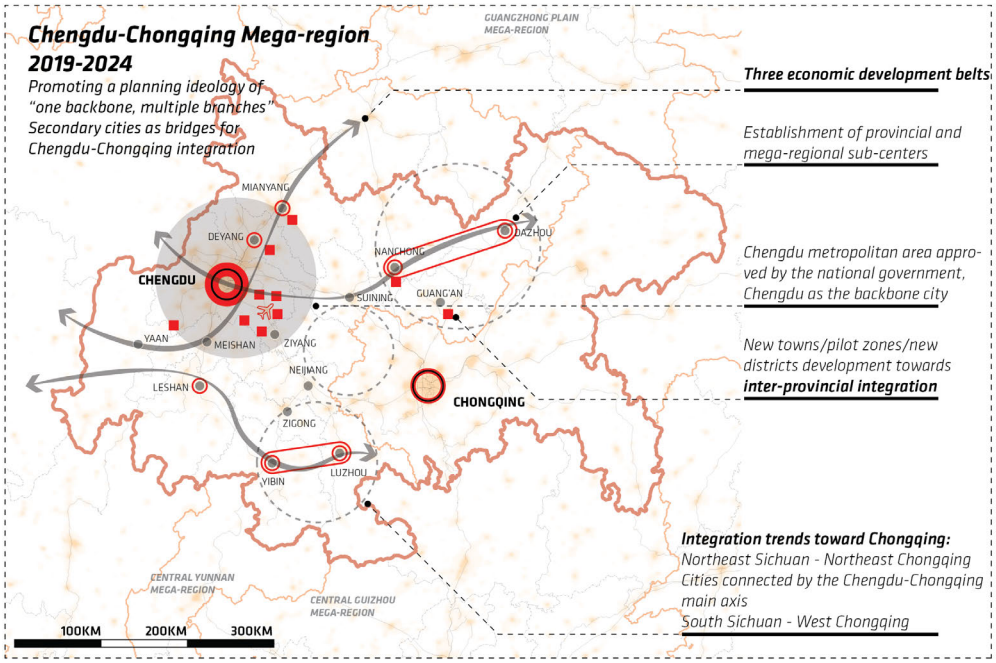

Conceptual illustration of key strategies in action plans across different stages of mega-regionalization - Chengdu-Chongqing mega-region

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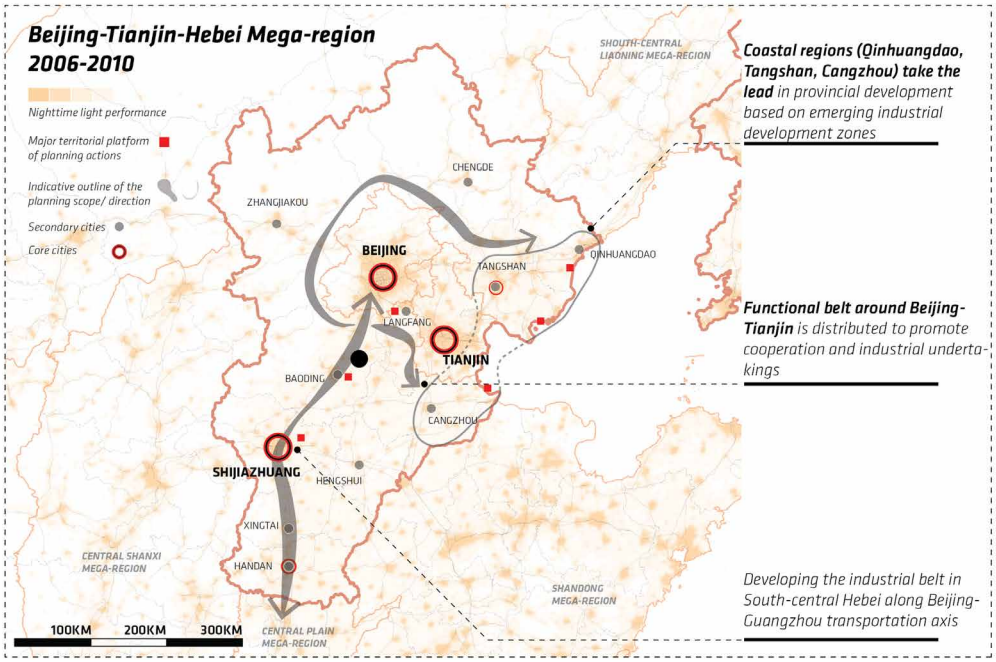

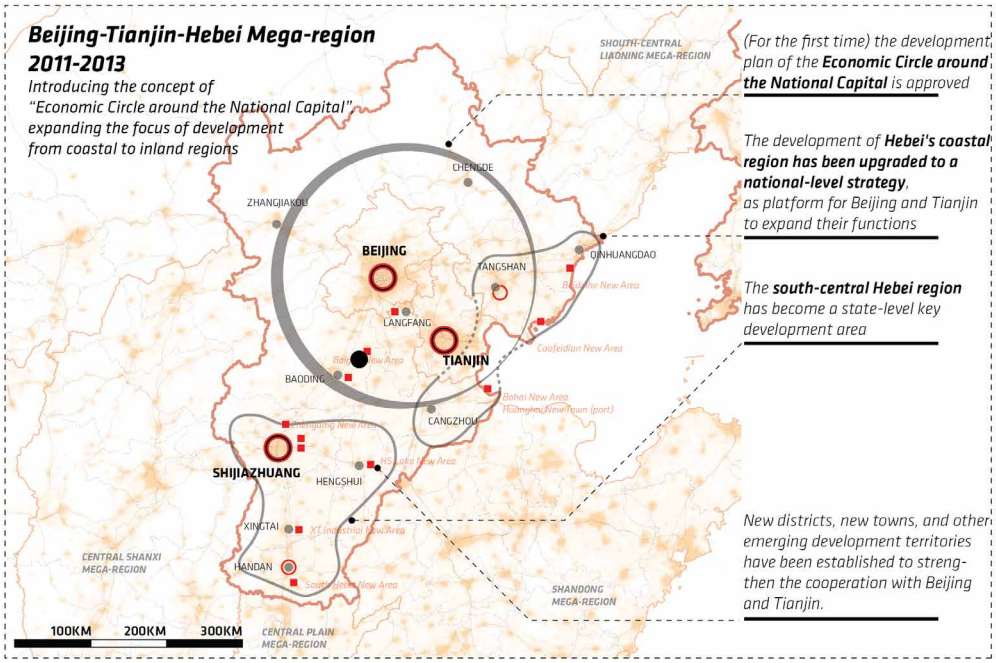

Conceptual illustration of key strategies in action plans across different stages of mega-regionalization - Beijing-Tianjin-Hebei mega-region

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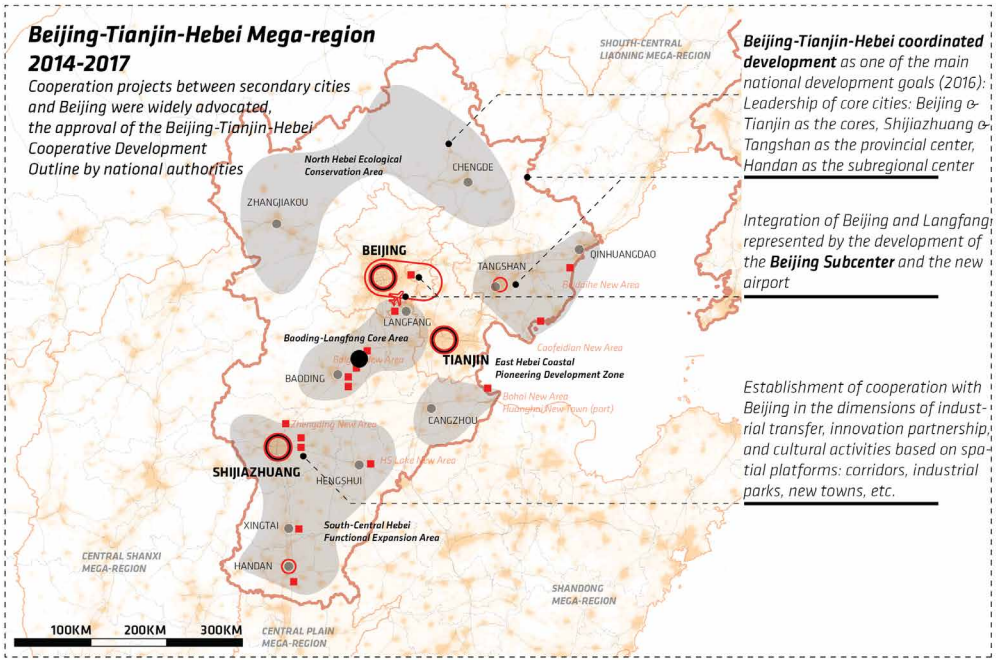

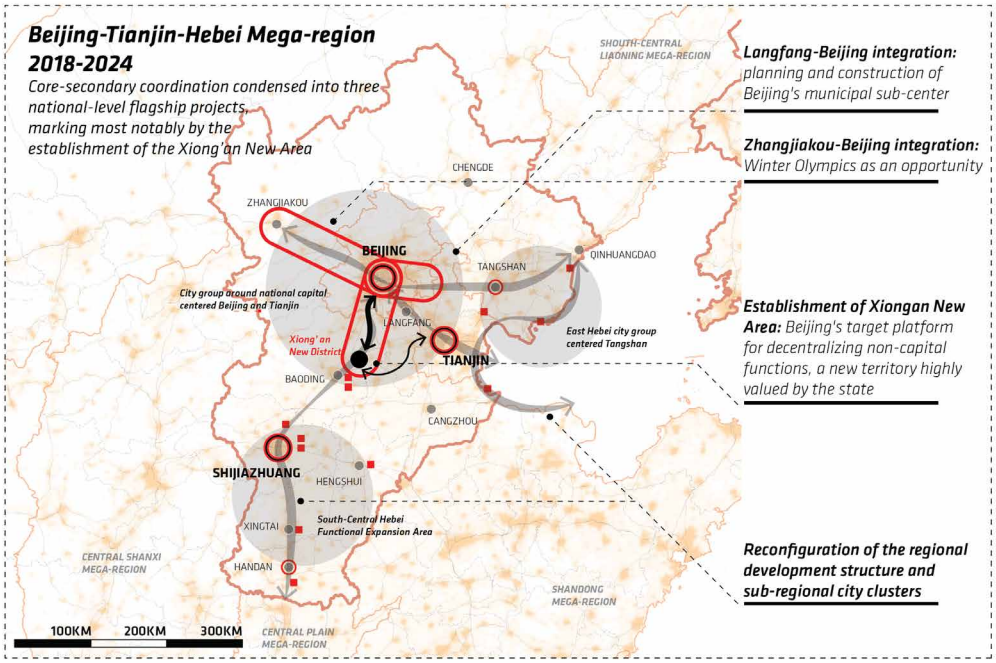

Conceptual illustration of key strategies in action plans across different stages of mega-regionalization - Beijing-Tianjin-Hebei mega-region

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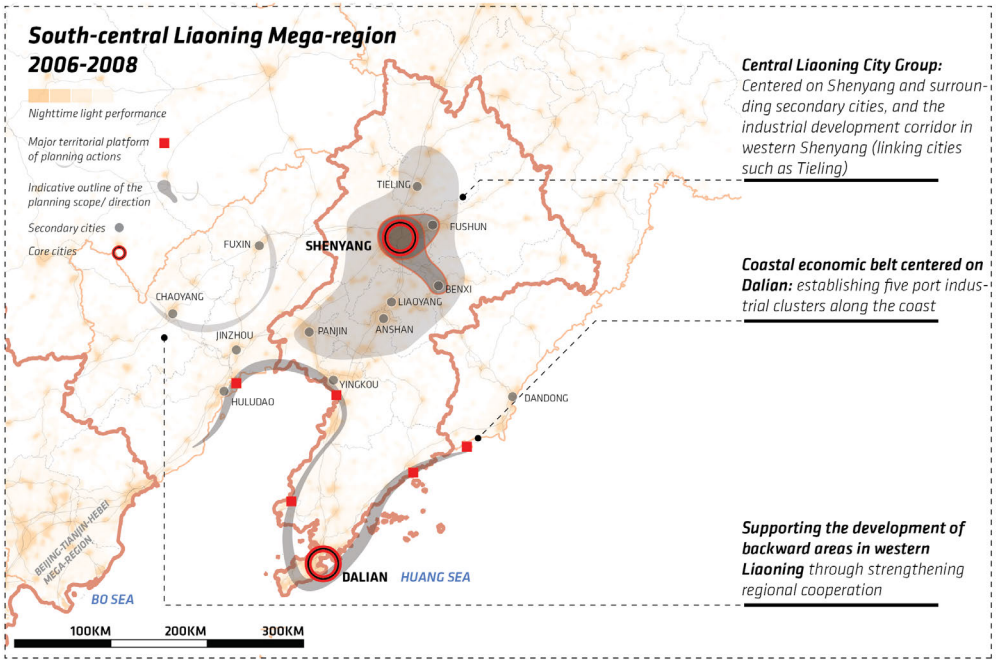

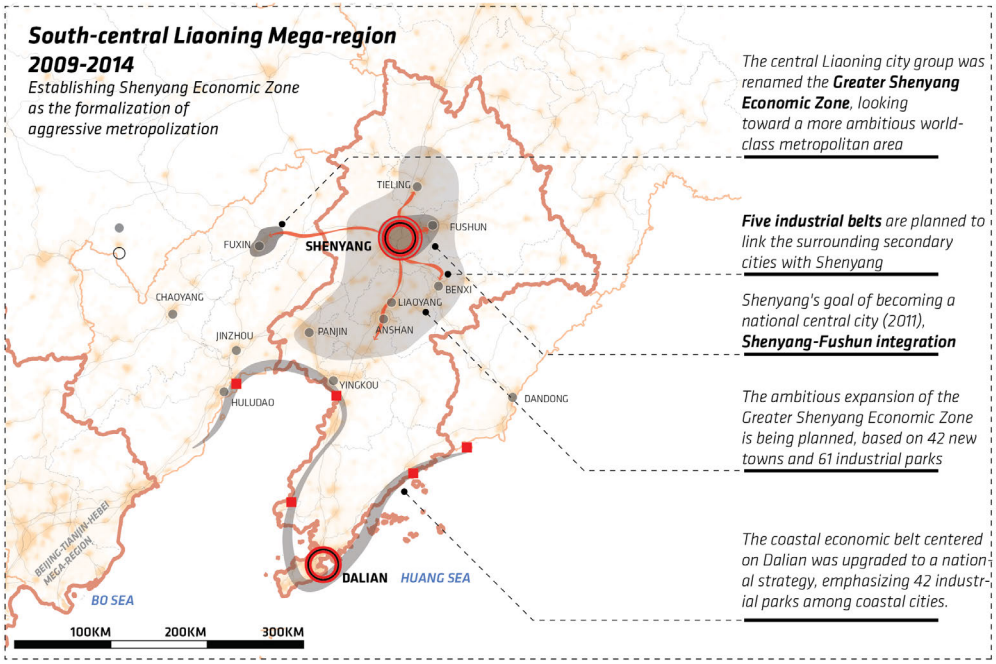

Conceptual illustration of key strategies in action plans across different stages of mega-regionalization - South-central Liaoning mega-region

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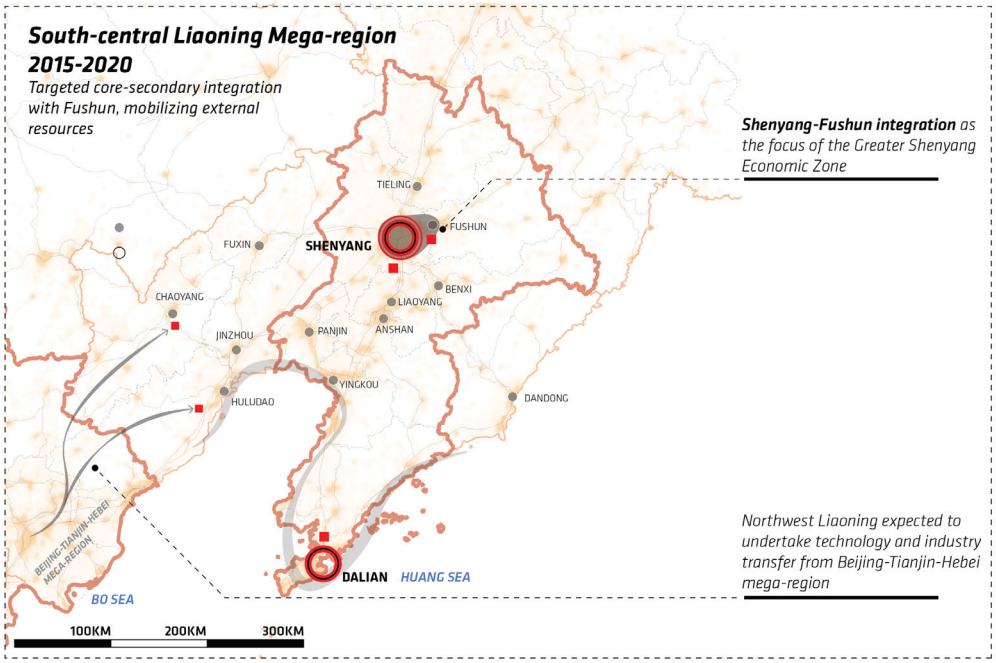

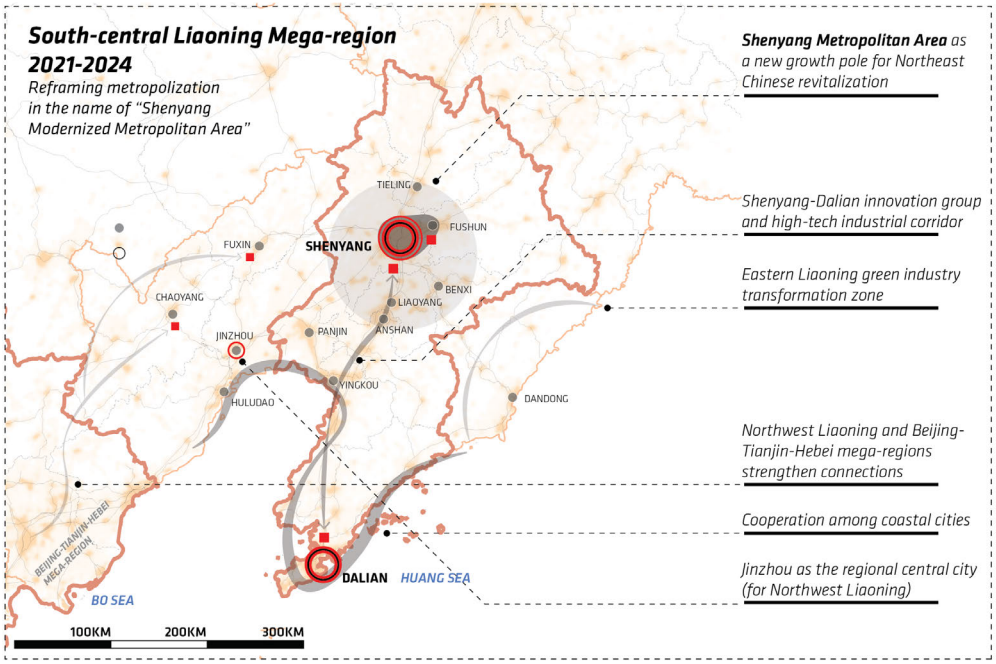

Conceptual illustration of key strategies in action plans across different stages of mega-regionalization - South-central Liaoning mega-region

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Some secondary cities experienced rapid growth over the past two decades, often by relying on resource-based industries or manufacturing to serve core cities, and by benefiting from the boom of the land-based economy. Factories and newly built residential blocks spread rapidly across the urban landscape, but this development model also planted the seeds of future decline in secondary cities.

Factories and unfinished residential buildings in Handan, photographed by Kaixuan Wen.

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5 Passiveness in state entrepreneurialism

How secondary cities survive mega-regionalization

The content of this chapter is currently under review by the journal Political Geography.

ABSTRACT Regional development often brings about the rise of "superstar" cores as dominant growth engines, producing polarization and peripheralization pressures on their smaller neighbors, conceptualized here as secondary cities. In China, planning authorities have attempted to address this issue by promoting top-down mega-regions as new spatial units for coordinating core-secondary relations, combining central planning with market-oriented inter-city interactions, an approach widely framed as state entrepreneurialism. Yet despite the encouragement of entrepreneurial activities aimed at building more efficient, profitable, and open regional systems, intra-regional unevenness has not been substantially alleviated. Against this backdrop, we focus on secondary cities and examine two questions from their perspective: (1) how secondary cities adapt entrepreneurial strategies to implement the central state's developmental goals within mega-regionalization; and (2) what practical obstacles prevent these strategies from achieving the intended outcomes of mega-regionalization, thereby failing to reduce unevenness with core cities. Using Handan in the Beijing-Tianjin-Hebei mega-region as a representative case, we find that secondary cities typically pursue three forms of entrepreneurial action: seeking external support, mobilizing internal specificities, and promoting metropolization. However, their passive positions within mega-regional coordination creates significant practical barriers that hinder the spatialization of coordinated development. The passiveness of secondary cities identified here are also examined in the preceding chapters through place-, priority-, and actor-related governance mismatches inherent in state entrepreneurialism. We further conceptualize them as horizontal governance mismatches, which structure core-secondary relations in terms of co-existence,

connectivity, and cooperation, and shape how entrepreneurial strategies are enacted at the local scale of secondary cities. This study contributes a needed bottom-up perspective by exploring mega-regions as state-entrepreneurial systems in which secondary cities struggle to achieve goals from the central state by concrete entrepreneurial activities. It also offers policy insights by identifying how secondary-city passiveness constrains the effectiveness of mega-regional coordination, pointing toward more balanced and responsive regional planning frameworks.

KEYWORDS Mega-regionalization; secondary cities; state entrepreneurialism; practical obstacles.

5.1 Introduction

The rise of regionalization is generally attributed to two drivers. For functional integration, globalization has facilitated the regional division of labor, which in turn created inter-city networks of materials, information, and labor, underpinning regionalization (Burger et al., 2014; te Velde, 2011). For coordinated governance, the desire for a stronger institutional body led some cities to form alliances with their neighbors to strengthen their overall competitiveness and political voice in the global market (Cardoso, 2016; Haughton et al., 2016). However, in China, such regionalism goes beyond functional integration or the rise of **inter-municipal governance alliances**. It is better understood as "*a centrally orchestrated regional imaginary and regional cooperation through multi-scalar alliances*" (Li et al., 2025). This reflects a planning imaginary: regionalization in China is not an fully materialized spatial entity, but rather a vision of efficiency and integration yet to be realized (Harrison & Gu, 2021). It also highlights the centrally coordinated nature, where the central state assumes the leading role as the primary initiator and coordinator of regional projects (Wu, 2016). In other words, this **state-led regionalism** takes shape through the interweaving of territorial re-configuration and institutional re-organization rather than simply arising from market-led urban dynamism (Jonas, 2013; Song & Zhang, 2025), conceptualized as **state entrepreneurialism** (Wu, 2018; F. Zhang et al., 2023): The state is not a passive responder to market forces but an active agent that strategically mobilizes market to promote capital accumulation, industrial restructuring, or spatial transformation (Song & Zhang, 2025).

Since 2006, the Chinese central government has formally designated mega-regions as the key spatial vehicles for further urbanization (CNDRC, 2006). This initiative seeks to foster inter-city coordination at the regional scale, thereby avoiding the resource waste or production redundancy caused by excessive market competition

(Wu, 2016). Consequently, the mega-region has been selected and framed by the state as a new spatial unit of regional governance as a regulatory scale through which the state supervises and ensures the fulfillment of political objectives (Zhang et al., 2024). Local state actors, in turn, are expected to assume "profit-seeking" entrepreneurial responsibilities for the welfare of local residents: strengthening their competitiveness in the regional market through investment attraction, innovation cultivation, or industrial upgrading, thereby contributing to the overall regional growth (Zhang & Xu, 2024; Wu, 2020).

On this basis, the rise of smaller cities also constitutes an important state goal of mega-regionalization to rebalancing the regional unevenness. Since the 1970s reform era, China's growth-pole strategy has concentrated resources in coastal metropolises to attract global capital and drive export-led growth, later extending to inland regions to ease spatial inequality (Du et al., 2025). Today, core cities face rising costs and social pressures, while smaller cities struggle with shrinkage, industrial decline, and population loss (Xu et al., 2025). Meanwhile, the potential of smaller cities has drawn growing attention. As emerging nodes in regional networks, they can absorb spillover resources from core cities, industrial relocation, infrastructure investment, and extended services, thus serving as new pivots of growth. Their livability, industrial diversity, cultural vitality, and institutional flexibility also make them promising grounds for sustainable and inclusive development (Mayer, 2022).

In this way, central state plan the territorial scope of mega-regions around highly developed core metropolises with the intention of strengthening the linkages between them and surrounding smaller cities regarding infrastructure, market activities, and multidimensional cooperation, to form a more balanced polycentric regional system (CNDRC, 2021; Li et al., 2022). Here in this chapter, we conceptualize these smaller cities as mega-regional "secondary cities" to emphasize their close and multidimensional relations with core cities regarding infrastructure, socioeconomic linkages, and collaborative governance (Du et al., 2024). Mega-regionalization provides emerging opportunities for these secondary cities, as they are expected to be integrated into and benefit from the dynamic regional market under the paradigm of state entrepreneurialism. First, they are expected to receive development resources from the cores, including industrial transfers, knowledge and technology spillovers, and policy preferences (Ning et al., 2016). Second, authorities tend to reduce the further expansion of cores, emphasizing the potential of secondary cities (Zhao, 2011). Third, market-led inter-city competition is questioned, and cooperation is envisioned (Luo & Shen, 2009). Thus, realizing these initiatives fundamentally depends on building, strengthening, and optimizing relations between mega-regional cores and secondary cities.

However, nearly two decades after mega-regionalization has been promoted in China, secondary cities still suffer from uneven regional development and face two challenges. Regarding **polarization**, regional development resources still continuously agglomerate in the core because these big cities have greater attraction for talents and investments (e.g. Wei et al., 2020). Regarding **peripheralization**, the cores dominate regional development because of their stronger profitability, political discourse, and regional identity, and secondary cities are becoming less relevant and left behind because of their weak positions (e.g. Fan et al., 2021; Li & Jonas, 2023). While existing studies have extensively examined the complex stakeholder dynamics of state entrepreneurialism reflecting on regional unevenness, such as the uneven power relations in developing enclave industrial parks or achieving state-led goals like environmental protection (Wang et al., 2024; Zhang et al., 2022), systematic attention to secondary cities and the specific challenges they face remains limited within this framework. Accordingly, this chapter aims to address two questions through selected empirical cases: **First, how do secondary cities adapt entrepreneurial strategies to implement the central state's developmental goals within the process of mega-regionalization? Second, what are the practical obstacles that have prevented these efforts from producing the expected outcomes, thereby failing to alleviate the unevenness between core and secondary cities?**

This research addresses a key gap in mega-regionalization studies, the lack of bottom-up perspectives, particularly from secondary cities as "left-behind players" where regional policies intended to reduce unevenness often fail to do so (Fiorentino et al., 2024). Although there is a growing consensus that secondary cities are generally in a weak position while resources go into big cities as the "winning horse" (MacKinnon et al., 2022), the specific local constraints of secondary cities are not identified. It is, therefore, necessary to reflect on what opportunities these regional policies and actions have brought when seen from the local scale of secondary cities, through what spatialization processes they have functioned, and whether this has helped them overcome unevenness. Our study takes the specific case of a secondary city in China to understand the specific practical struggles.

The next section focuses on the conceptualization of mega-regionalization from a secondary city perspective under the framework of state entrepreneurialism. Section 3 develops the research design, including the case selection and the specific methodology. Sections 4 and 5 address the two research questions respectively. The chapter concludes with a discussion in sections 6 and 7.

5.2 Conceptual underpinning

5.2.1 Defining secondary cities embedded within mega-regional spatial relations

Although "**secondary city**" is not yet a common term in China, the concept highlights smaller cities with weaker functional and political weight closely related but outside of the main cores (Cardoso & Meijers, 2017). In this way, scholars tend to refer to ordinary prefecture-level cities as secondary cities in Chinese mega-regional system, apart from centrally-administered municipalities, provincial capitals, and sub-provincial cities, which gather higher-end functions and more political power (e.g. Wu et al., 2024). When examining the challenges of secondary cities, the spatial relations between core and secondary cities offer a useful analytical lens (Burger et al., 2014; Derudder et al., 2022). On one hand, their polarization and peripheralization stem from the stronger economic and political agglomeration of cores; on the other, better coordination is essential for mutually beneficial interactions. Burger et al. (2014) note that spatial relations in mega-regions evolve across multiple dimensions as regional systems shift from hierarchical to more networked forms. This includes shifts in morphological patterns, such as the transition from monocentric to more polycentric configurations that reshape political narratives (Jaros, 2016); changes in inter-city flows, where multidirectional interactions generate broader externalities for smaller urban entities (Meijers & Burger, 2017); and transformation in functional linkages, moving from "vertical complementarity" dominated by cores toward more balanced, specialization-based forms of "horizontal complementarity".

In this light, mega-regionalization in China can be re-conceptualized as **a state-led process of regional governance that coordinates spatial relations between core and secondary cities, emphasizing morphological polycentricity, multidirectional spatial flows, and functional complementarity**. Notably, Chinese mega-regions are seen more as planning imaginations, existing as part of the visions of authorities but not corresponding to any functionally, spatially, or institutionally coherent entities on the ground (Harrison & Gu, 2021; Tongjing & Meijers, 2024). Therefore, coordinated spatial relations are even more critical, as they will guide the functional positioning, development direction, and political orientation for secondary cities to benefit from mega-regional systems. In the national Fourteenth Five-Year Plan, nineteen such units have been designated (CNDRC, 2021), underscoring the crucial role of secondary cities: From a spatial governance perspective, as the problem of

overcrowding in cores is receiving more attention, secondary cities are expected to accommodate population and industries, thus serving as new growth pivots targeting polycentricity (Liu et al., 2018). From an integrated network perspective, secondary cities are expected to receive more resource spillovers from the cores and benefit from the externalities of the network (Ren et al., 2024). From an economic perspective, cooperation among cities is strongly initiated to alleviate zero-sum inter-city competition (Wu, 2016), with secondary cities playing key functional roles.

5.2.2 Governing core-secondary relations under state-entrepreneurialism

As one of the key paradigms of state entrepreneurialism, the central state seeks to employ the emerging concept of the mega-region as a new form of regional governance (Li et al., 2025): By embedding coordination into the regional agenda, the state aspires to build a more spatially integrated and functionally complementary urban system to mitigate the challenges of polarization and peripheralization of secondary cities. However, a fundamental question remains: what does "coordination" actually mean, as term has been used in diverse ways in both academic and policy discourses. Within the framework of state entrepreneurialism, it becomes crucial to ask: what specific goals has the central state set to enhance coordination between core and secondary cities, and what kinds of entrepreneurial actions are encouraged to achieve these goals and address the challenges faced by secondary cities?

Scholars conceptualize regional governance in China as two intertwined processes of state entrepreneurialism (Li et al., 2025; Zhang et al., 2023). The first is the **centrally led regional imaginary**, characterized by a top-down spatial reconfiguration of regions. This process involves the state reshaping regional spaces through planning instruments, thereby transforming the region into a spatial vehicle for capital accumulation and the consolidation of state power (Su & Lim, 2023; Wu et al., 2025). In this sense, coordination is not the outcome of spontaneous inter-city partnership but rather a state-led process driven by central planning. The second is regional cooperation through **multi-scalar alliances**, which promotes cost-benefit sharing and market-based collaboration across administrative boundaries (Tang et al., 2022). This process represents both a structural response to central initiatives and a local entrepreneurial strategies for further growth. From the perspective of secondary cities, these two processes, the central goals of coordination and local entrepreneurial responses, together form the analytical basis for understanding their position in state entrepreneurialism. They can be further deconstructed into three dimensions (Figure 5.1).

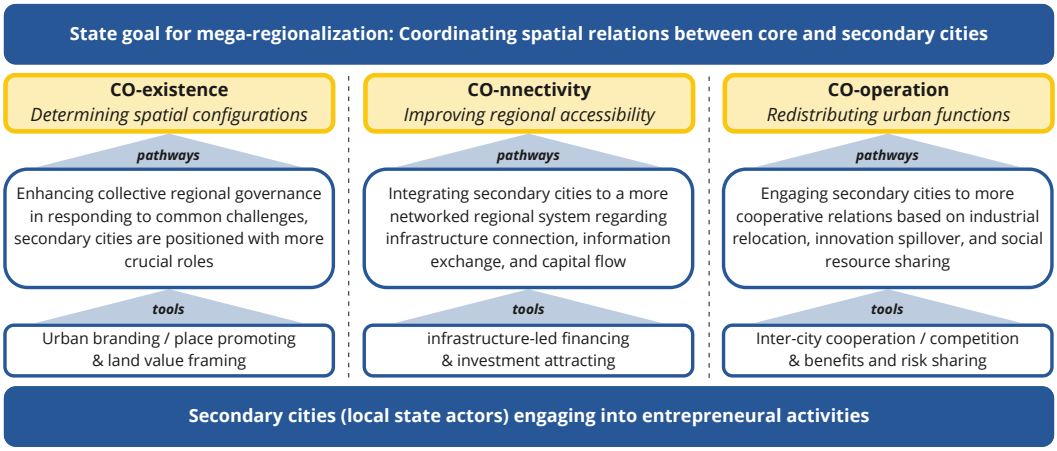

FIG. 5.1 Mega-regional coordination for secondary cities under state entrepreneurialism

First, **CO-existence**. This refers to certain overall rules to avoid the rise of some cities at the expense of others, including mutual consideration of the environment and ecology, or strategies preventing industrial homogenization and production redundancy (Wu et al., 2024). By embedding the notion of inter-city coexistence into regional governance, the central state seeks to advance a vision of sustainable and balanced growth that prioritizes quality rather than mere speed (Wu et al., 2025). Spatially, this vision is often materialized through the restructuring of regional configurations along development axes and corridors, treating the region as a coordinated and integrated whole (Gao et al., 2017). Therein, secondary cities are expected to play a pivotal role. For example, when confronting regional unevenness, core cities suffer from the diseconomies of over-concentration, while secondary cities face the risks of shrinkage (Fol, 2012). Consequently, they are often positioned as new growth nodes to absorb redundant or spillover functions from the cores and also to contribute to ecological restoration, industrial transformation, and innovation in responding to common crises (e.g. Wang et al., 2025). Even without immediate access to resources such as major projects or funding, secondary cities can still engage in entrepreneurial actions by reshaping their urban brands and promoting distinctive place identities for investment attraction, such as “green” or “innovative” cities (Morrison & Coca-Stefaniak, 2024).

CO-nnectivity refers to the interactions and linkages among cities through infrastructure, information exchange, and open markets (Fang et al., 2020; Xu et al., 2019). By strengthening these connections, the central state aims to build a more cohesive regional alliance: internally, providing the spatial foundations for division of labor and cooperation; externally, enabling the region to act as

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an integrated entity in global competition (Zhang et al., 2023). Such connective channels intensify the flows of materials, capital, and information, moving toward a more efficient, open, and synergistic regional system (Xu et al., 2019). For secondary cities, the enhancement of connectivity functions as a crucial instrument for entrepreneurial practices. It stimulates infrastructure-led growth initiatives such as the construction of high-speed rail new towns, transit-oriented investment zones, or financial platforms established to participate in open markets (Wei & Zhen, 2025). More importantly, these connective channels constitute the basis on which secondary cities can capture spillover resources from core cities: transport infrastructure facilitates industrial relocation and factor mobility; information exchange accelerates technological and knowledge diffusion; and market openness improves institutional conditions to better accommodate investment and projects (Fan & Zang, 2026).

Building on the ideological orientation of CO-existence and the mobility foundation of CO-nnectivity, **CO-operation** further explores the potential for secondary cities to integrate into a coordinated mega-regional system. This dimension emphasizes the joint development of urban projects between core and secondary cities. The central state promotes more differentiated and functionally complementary urban positionings, guiding the de-concentration and relocation of redundant core-city functions toward secondary cities (Zhang et al., 2024). Also, at smaller scales, cooperation takes shape through jointly developed cross-jurisdictional industrial parks, co-built innovation clusters, and shared research and industrial platforms, forming institutionalized mechanisms of inter-city collaboration (Lingfan et al., 2025). For secondary cities, this logic of cooperation directly stimulates entrepreneurial urban actions. Seeking closer ties with core cities and hoping to benefit from functional spillovers (Xu et al., 2019), secondary cities actively market their competitive advantages, enhance their investment environment, and provide service, infrastructural, and policy support for incoming industries. Such efforts often intensify inter-city competition and have been conceptualized as “competitive cooperation”, cities compete for projects, resources, and functions, yet remain embedded in a regional framework that requires collaboration (Lingfan et al., 2025). Within this process, cities increasingly enter into interdependent benefit-risk sharing relationships (Zhang et al., 2024). Thus, regional cooperation involves both sharing resources and jointly bearing risks and coordinating governance responses.

5.3 Case selection and methods

Handan, a typical secondary city in the Beijing-Tianjin-Hebei mega-region, is a representative case for deeper exploration. This is because, in this mega-region, Beijing (the national capital), Tianjin (centrally-administered municipality), and Shijiazhuang (the provincial capital), as the cores, form various types of uneven spatial relations with Handan. First, Beijing, a global city with strong political voice and a competitive economy, casts a **metropolitan shadow** to secondary cities like Handan (Table 5.1). According to our typology of secondary cities in Chapter 2, while the core city gathers most of the attention and resources, secondary cities suffer from worsening challenges, which Chinese scholars refer to as "darkness under the lights" (Liu et al., 2016).

TABLE 5.1 Handan and its representative spatial relations with the cores

Typology of uneven core-secondary spatial relations	Specific features	Relations between Handan and its surrounding cores	Specific features
Secondary cities struggling in the metropolitan shadow	Lower political voice and neglect in the regional system	**Relations between Handan and its surrounding cores**	Development resources and political focus concentrated on the cores
Weak core V.S. weaker secondary city	Economic transformation as a common problem for both core and secondary cities	**Handan- Shijiazhuang**	Shijiazhuang as a weak core city, lack capacity to drive growth of neighboring secondary cities
Large metropolis V.S. tiny players	Great gaps between core and secondary cities. Lack of regional embeddedness for secondary cities	**Handan- Greater Beijing economic ring**	Not well-integrated within the core area of the mega-region, significant disparity with the core city

This typology also points out two other problematic spatial relations in the Chinese mega-regional system, reflected in the spatial relations between Handan and its neighboring cores. One is called **weak core V.S. weaker secondary city**, highlighting that even though there is no overly noticeable development gap between the core city and the secondary city, it does not mean that they form a balanced system, but instead, face a common decline. This is a widespread phenomenon in the mega-regions of Northeast China, where all cities experience difficulties in industrial transformation (Zhang, 2008). The relation between Handan and the provincial capital, Shijiazhuang, falls into this type. Shijiazhuang is often questioned for its poor economic performance and both cities are going through a difficult period of economic restructuring, required by authorities for the transformation of heavy

industry (Shi, 2012). The other type is **large metropolis V.S. tiny players**, which refers mainly to disparities in urban size. The fate of tiny players is, therefore, strongly attached to the development policies of the cores, and secondary cities that are included in core expansion plans have a better chance of accessing opportunities. Handan is not demographically small, with a population of nearly 10 million across the entire territory, but the city has long been on the periphery of the mega-region where the greater Beijing economic ring is the central focus.

Therefore, Handan is a representative case in the Chinese mega-regional system that captures the struggles faced by many other secondary cities. Beijing-Tianjin-Hebei is one of the most important mega-regions in China, with three provincial-level administrative regions and 13 cities. Handan is located in the southernmost part of this mega-region, which is often positioned as the "Southern Function Expansion Area" in mega-regional plans, as a platform for undertaking redundant urban functions relieved by Beijing and as an essential base for fostering new industries and promoting industrial transformation (DNR Hebei, 2021). Handan is at the crossroads of four mega-regions and included in the fringe of the Central Plains mega-region. It is also situated on the Beijing-Guangzhou national development axis and is, well connected to the surrounding mega-regional cores (BNR Handan, 2021).

In the Chinese administrative system, "cities" in mega-regions are often recognized as prefecture-level cities which are more like sub-provincial city-regions than single urban entities. The territory of these prefecture-level cities is divided into districts or counties, which are further divided into townships consisting of central towns and villages. This hierarchical administrative unit is the spatial basis of China's regional governance, with upper levels having authority over lower levels (Zhou et al., 2018). In Handan, the municipal territory is composed of many urban cores, villages, and various types of landscape (agricultural land and mountain areas). The overall population is about 9.41 million (National Seventh Census, NBS, 2021), with the main center of the prefecture-level city hosting about 2 million people (including two major economic development zones), and the other counties ranging from about 200,000 to 850,000 (Figure 5.2).

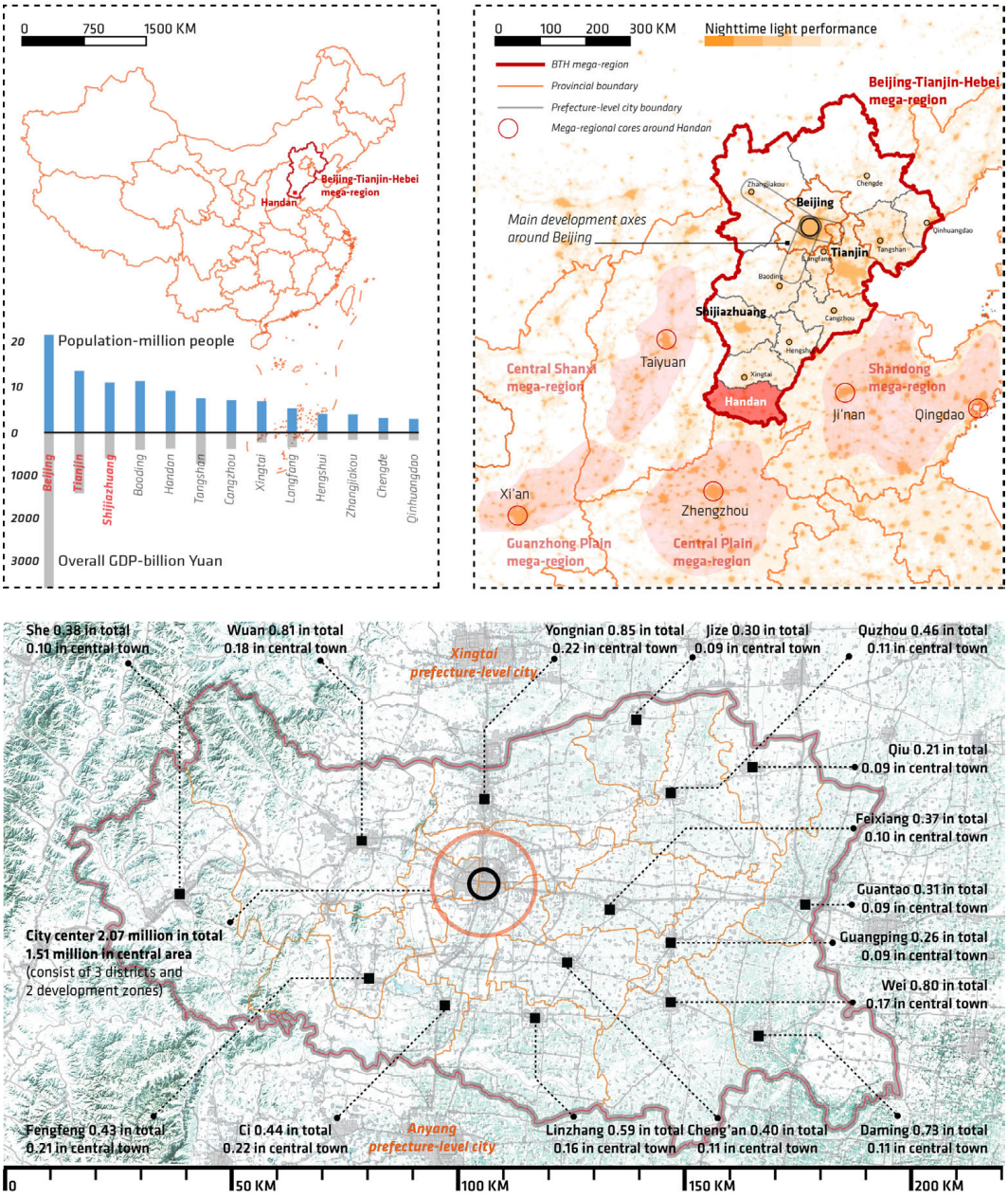

FIG. 5.2 Handan prefecture-level city in Beijing-Tianjin-Hebei mega-region

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With a history of more than 3,000 years, Handan is one of the cultural cradles and a major commercial capital of ancient China (Huang et al., 2024). Until the founding of New China in 1949, Handan was an important industrial city because of its coal mining resources and infrastructure basis, and it prospered consequently. However, in the 2000s, the city gradually lost competitiveness in the wave of globalization and marketization compared to the emerging metropolises on the Southeast coast, benefiting from open-door policies. This was followed by the national initiatives for industrial innovation and new technologies, which again hit the pillars of Handan's economy because of its longstanding dependence on resource-based heavy industry (Yang, 2014). Since the mid-2010s, the authorities began to emphasize environmental protection, pollution prevention, and the unloading of redundant heavy industrial production, resulting in a severe impact on the economy (Li et al., 2021).

The main methods used to explore Handan in depth are, first, policy research, in which we study the governmental yearly reports of Handan since 2006, the year when the authorities officially kicked-off mega-regionalization. This is because such reports often document governance actions, development priorities, and spatial arrangements to implement mega-regional planning visions, supporting us in clarifying the logic and specific approaches to spatialization. Second, we conducted a two-week field survey between October 23 and November 5, 2023, in Handan. This was mainly to further observe and understand the current status of planning implementation and major projects and validate the information extracted from the policies. Finally, we established close contact with 18 local senior government officials in Handan and academic experts in the field of regional planning. 12 semi-structured interviews of 60-90 minutes were conducted from December 2 to December 22, 2024, and 31 public or non-public documents related to mega-regionalization were collected from the local officials. We have since maintained communication with these interviewees for further updating, correcting, and supplementing the data collection and analysis, also consolidating the findings.

5.4 Surviving mega-regionalization by mobilizing entrepreneurial activities

To examine the entrepreneurial activities through which Handan seeks to advance the state's regional-coordination goals, we adopted the 3-CO framework to screen, extract, categorize, and synthesize the content of governmental yearly reports. These elements were subsequently validated and thematically refined through fieldwork and interviews (Figure 5.3).

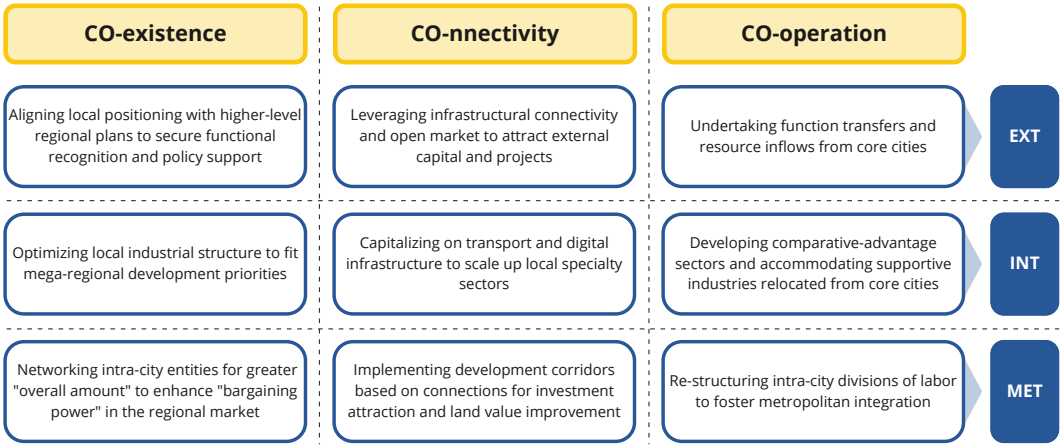

FIG. 5.3 Entrepreneurial activities towards core-secondary coordination

5.4.1 Searching for EXTernal support to strengthen socio-economic competitiveness

The most straightforward impact of mega-regionalization on secondary cities is the opportunity for beneficial interactions with the cores through an inflow of resources, which we conceptualize as **external support (EXT)**. At the coexistence level, mega-regional planning often assigns certain functions to secondary cities, including social service facilities, industries, and innovative technologies, to guide the division of labor and cooperation with the cores, targeting the redistribution of resources towards greater efficiency. On one hand, these new "functional positions" are based

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on the characteristics of the secondary cities, encouraging them to further capitalize on their strengths and increase their visibility in the region (Informant 13). On the other hand, they also imply a division of responsibilities and, implicitly, the demands and expectations of the secondary city authorities. In this way, Handan positions itself as a functional complement to the cores (Informant 2). The local government has translated this into concrete goals, namely being a recipient of advanced manufacturing, a target for food industries branching, a platform for cooperation in healthcare and education, and a tourism destination (Informant 8 & 11). For secondary cities, pursuing these assigned functions constitutes an entrepreneurial effort to align local positioning with higher-level regional plans to further secure functional recognition and policy support.

Improving connectivity between core and secondary cities is a crucial step for putting their assigned functional roles into practice. For secondary cities, enhancing connectivity is not merely about building infrastructure; it is an entrepreneurial strategy to widen access to markets, investment, and technological flows (Informants 5, 13 & 14). Beyond transport systems that facilitate the circulation of industries, capital, and talent, secondary cities actively engage in information exchange and branding. In seeking external resources, they frequently draw on the broader mega-regional identity, or highlight their association with a “superstar core”, to signal credibility and developmental potential to “investors” (Informants 6 & 14). Through these efforts, secondary cities attempt to construct relational advantages and open up new channels for market engagement, mobilizing connectivity as a tool to strengthen their ties with external markets and attract capital, projects, and partnerships.

Undertaking functional transfers and resource inflows from core cities has become a key development pathway for secondary cities. In the case of Beijing’s non-capital function relocation, the central government has required the dispersal of general manufacturing, regional logistics bases, education and training institutions, and other functions misaligned with the national capital’s roles (Liu & Sun, 2020). Handan interprets this state-led redistribution as a crucial opportunity, designating the South Hebei New District as the main spatial platform for receiving potential transfers (Informants 1 & 5). To strengthen its capacity to attract such inflows, the local government provides supportive policies and infrastructure, actively shaping a better institutional environment suited for hosting relocated functions (Informants 2). Overall, secondary cities like Handan adapt and localize these opportunities to attract resources and strengthen their regional standing, seen as an entrepreneurial act aimed at enhancing their socioeconomic competitiveness.

5.4.2 Mobilizing INTernal resources to improve local economic attractiveness

Building on the functional roles assigned in mega-regional planning, secondary cities actively integrate local resources and strengthen internal endowments to craft a more attractive local identity, an entrepreneurial practice that we conceptualize as **mobilizing internal resources (INT)**. Aligning with mega-regional visions requires significant adjustments to the local industrial structure. In Handan, this is reflected in long-standing concerns over environmental pollution and the transformation of heavy industries, both strongly emphasized by the central state (Informants 6 & 10). This alignment has challenged the city's traditional industrial base, leading to the closure of small steel and coal plants that failed to meet environmental standards and imposing stringent controls on larger enterprises. These actions, while placing considerable pressure on the local economy, represent deliberate entrepreneurial efforts by local state actors to reconfigure the industrial structure in line with mega-regional policy orientations. Also, they aim to free up development space for hosting more advanced resources and functions that may flow from core cities (Informants 6, 8, & 9).

As Handan seeks to break its long-standing dependence on polluting heavy industries, the search for new development pathways becomes an entrepreneurial task for local state actors. Enhanced connectivity with core cities provides the foundation for scaling up local specialty sectors. As an ancient city with a deep cultural heritage, Handan has long viewed tourism as a strategic asset, one that can be upgraded into a new growth driver through improved accessibility and regional promotion (Informant 11). Similarly, efforts to develop local agriculture and cultural industries aim to reshape the city's identity away from the label of a "heavy industrial city" and toward a more diverse and attractive urban profile (Informant 5).

Also, Handan's search for alternatives involves identifying complementary niches within the development needs of core cities. By developing sectors based on comparative advantages such as processing services for high-end manufacturing, Handan positions itself within regional supply chains and creates market-based channels for cooperation (Informant 6). Secondary cities also treat knowledge and technology spillovers from cores as valuable resources for upgrading local industries. In Handan, universities and research institutes in Beijing and Tianjin are seen as key partners, and the city provides dedicated spatial platforms to host research branches (Informants 8 & 14). In this way, creating the institutional and spatial capacity to accommodate industries and resources relocated from the cores represents entrepreneurial actions for secondary cities to align with mega-regional priorities and enhance their future spillover-capturing potential.

5.4.3 Promoting METropolization to re-arrange socio-economic growth and transformation

Another entrepreneurial strategy adopted by secondary cities is **metropolization (MET)**, which promotes integration among the multiple urban units within the prefecture. As a prefecture-level city, Handan is not a single urban entity but a jurisdictional territory composed of a central city and surrounding towns, villages, farmland, and natural landscapes. Metropolization functions as an entrepreneurial response to state-led regional goals by enabling secondary cities to reorganize internal space, thus present themselves as more competitive nodes within mega-regional system. As an emerging intra-city space for capital accumulation and a platform for policy implementation, the planed metropolitan area allows cities to mobilize internal strengths through resource reallocation, while simultaneously providing a new territorial entity capable of attracting and utilizing external investment (Björling & Capitao Patrao, 2024; Cardoso & Meijers, 2021).

Through this upscaling effort by intra-city entities for greater "overall amount", the development gap between secondary city and cores is somewhat mitigated statistically without further loss of political voice. This also leads to the restructuring of functional clusters. For example, the local government of Handan hopes to link tourist attractions throughout the entire territory through river and mountain landscapes, to attract consumers from neighboring cores (Informant 11). This orientation builds on Handan's existing transport infrastructure, including the north-south Beijing-Guangzhou and east-west Qingdao-Lanzhou national transportation axes. The government also plans to revive intra-city rail lines, originally constructed for the coal industry but later abandoned, to strengthen connections between the metropolitan center and surrounding towns. This essentially seeks to enhance the bargaining capacity of secondary cities in the regional market by presenting themselves as a more coherent metropolitan entity (Informants 1, 2, & 8).

The metropolization also centers on implementing various industrial corridors. By aligning industrial development with major transport routes, Handan seeks to channel investment flows along these corridors and create spatial zones that can host higher-value industries (BNR Handan, 2021). On this basis, metropolization requires a restructuring of intra-city divisions of labor. County-level units are encouraged to specialize based on their specific strengths, and prefecture-level government often restrict each county to no more than three pillar sectors to avoid homogenization, redundant production, and internal competition (Informant 3). While county governments are the primary implementers of investment attraction, the prefecture-level government retains the authority to determine where industries are ultimately located, ensuring that industrial placement aligns with the intended

division of labor and metropolitan structure (Informants 3 & 6). These dynamics generate a more complex partnership between core and secondary cities. Collaboration is no longer limited to top-down spillovers (based on official projects) but also emerges from bottom-up endeavors in which intra-city entities seek sector-specific linkages with external cores, arising through market-driven corridors of industrial complementarity built and managed by local officials (Informants 1 & 6).

5.5 Practical obstacles: passiveness in mega-regional coordination of secondary cities

Despite operating under the trend of state entrepreneurialism, mega-regional secondary cities such as Handan have acted as proactive state actors, seeking to integrate themselves into, and benefit from, mega-regional systems through local government-led initiatives. These cities tend to adopt three forms of entrepreneurial action in response to vision of mega-regional coordination from the central state. First, they seek external support by strengthening linkages with core cities and higher-level governments to secure policy endorsement, investments, and project resources. Second, they mobilize internal advantages and local specificities to construct distinctive positions within regional networks. Third, they attempt to integrate spatial configurations and resource allocation through metropolization to enhance overall economic competitiveness while aligning with the state's strategic agenda of building a more coordinated regional system with neighboring cores.

Nevertheless, while these efforts demonstrate the agency and adaptability of secondary cities, their outcomes are far from successful. In practice, a range of practical obstacles emerge, leaving the national vision of mega-regional coordination unrealized at the local scale of secondary cities. The case of Handan further reveals the key factors that hinder secondary cities from effectively integrating into and benefitting from the regionalization. At the regional scale, state entrepreneurialism embodies both the state's strategic imagination and spatial planning, as well as its encouragement of multi-scalar alliances and joint projects among cities based on market-oriented principles (Li et al., 2025). However, under entrepreneurial governance, characterized by market logic and competition-driven incentives, secondary cities generally exhibit multidimensional passiveness (Figure 5.4).

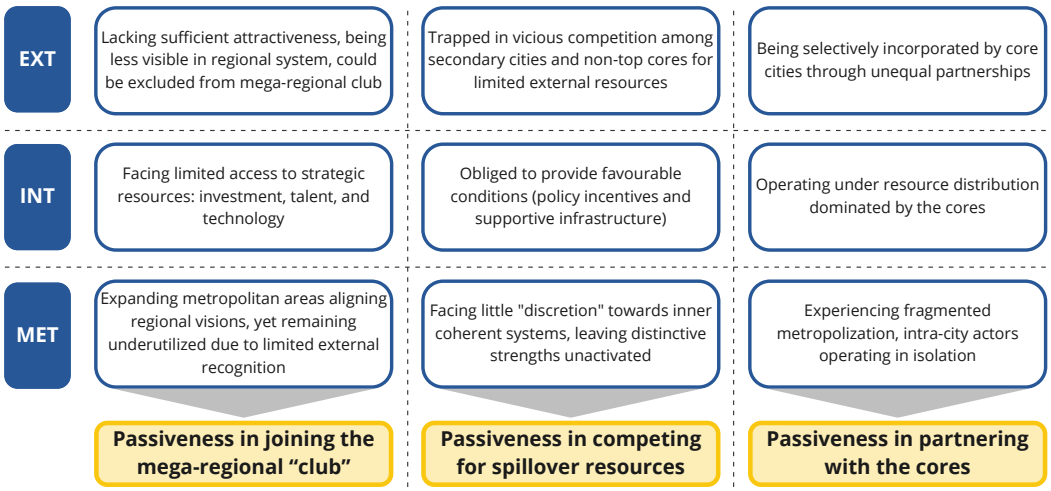

FIG. 5.4 Passiveness of secondary cities in mega-regional system

5.5.1 Passiveness in joining the mega-regional "club"

Until today, mega-regionalization in China seems to support secondary cities only in the sense of a more advanced functional positioning, although more aspects, namely resource redistribution, are mentioned in mega-regional planning. Therefore, in most cases, secondary cities can only rely on their own efforts to participate in this entrepreneurial game, which leads to passiveness in joining the mega-regional "**club**".

Mega-regionalization can be understood as the creation of a "club" at the regional scale: an institutional arrangement that coordinates member cities through shared rules, facilitates interaction, and generates collective value through collaboration. Yet such a club inevitably involves membership thresholds: cities that lack sufficient attractiveness or cannot offer reciprocal value are unlikely to be accepted as equal partners. Thus, although the central state formally includes secondary cities in national strategic frameworks, these cities often struggle to demonstrate the appeal necessary to build mutually beneficial relationships with core cities. For the cores, supporting secondary cities constitutes an additional burden, and under growth-oriented logics, they naturally prioritize their own expansion (Informants 1 & 7). As a result, the mega-region resembles a constellation in which all cities gravitate

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toward dominant “stars,” seeking upward ties rather than cultivating horizontal connections among peers. Clearly, secondary cities, lacking sufficient attractiveness and remaining less visible within the regional system, are often unable to integrate into the mega-regional club and risk being effectively excluded from it.

Handan, like many secondary cities, hopes to absorb regional spillovers but lacks the capacity to draw meaningful interest from the cores, making it difficult to effectively join the regional club and access the investment, technology, and other benefits that regionalization promises. Our interviewees mentioned that finding potential investments and industries to settle in Handan are very challenging political tasks for almost all local officials (Informant 1, 2, & 10). Cores prioritize growth within their own boundaries, leaving limited spillover resources for which multiple secondary cities must compete. Besides, the limited mega-regional cooperation led to Handan’s incapacity to turn its local resources into development drivers. In the case of culture and tourism, despite the enormous efforts by the local government in advertising, urban regeneration and marketing, our interviewees mentioned that “the quality of the currently local tourism resources is still insufficient in comparison with other top tourist attractions in the country. This can be attributed to the limited investment attraction, the absence of effective guidance, and low profitability of local tourism industries, which has failed to draw consumers from neighboring major cities (Informant 8)”.

Secondary cities lack both sufficient attractiveness and internal capacity, while core cities have neither the incentive nor the willingness to build a sufficient mega-regional “club”. This passiveness further undermines the effectiveness of metropolization, which is intended to restructure metropolitan space to raise the city’s visibility and functional capacity. Yet without recognition or resource infusion from cores, these strategies often result merely in intra-city spatial expansion rather than meaningful regional embedding by accommodating emerging urban functions. The case of South Hebei New District illustrates this dilemma (Informant 1). Designed as Handan’s key platform for engaging the Beijing-Tianjin-Hebei mega-regionalization and for receiving industrial transfers and innovation spillovers, the district has struggled to deliver substantial investment outcomes as project inflows remaining limited (Informant 14). In this way, the limited attractiveness of secondary cities, their constrained access to strategic resources, and the underutilization of metropolitan restructuring collectively produce their passiveness in joining the mega-regional “club”.

5.5.2 Passiveness in competing for spillover resources

Although local officials emphasize the need to shift from coal and steel to high-end industries such as advanced manufacturing, core cities rarely transfer their valuable functions. The industries that do spill over are often mismatched with secondary cities' developmental goals and fail to meet higher-level requirements such as environmental concerns (Informants 6, 7 & 10). As a result, secondary cities must actively search for external investment from other top cores outside the mega-region, yet they receive little meaningful support from nearby cores (Informant 6). This competitive pressure is also compounded by non-top core cities. In the Beijing-Tianjin-Hebei, for instance, only Beijing has begun functional decentralization under strong central directives, while another core Tianjin, facing its own economic slowdown, explicitly seeks to capture functions relocated from Beijing rather than cooperate with smaller neighbors (BNR Tianjin, 2021). Consequently, Handan and other similar cities become trapped in a vicious cycle: lacking support from nearby cores, they must compete not only with secondary cities in their own mega-region but also with those in other regions, and even with non-top core cities. This multi-level, zero-sum struggle for limited external resources fundamentally shapes the developmental passiveness of secondary cities. In this process, secondary cities often directly engage with enterprises and other market actors, while state actors in top core cities show limited willingness to release high-end functions and prefer to keep them locally. This makes it even harder for secondary cities in the regional competition (Informant 1).

To gain an advantage in fierce inter-city competition, secondary cities have to offer more favorable policy incentives and supporting infrastructure for industries relocating from core cities, becoming the entry requirements for participating in this regional competition (Informant 7). This again illustrates how secondary cities engage in mega-regional coordination as an entrepreneurial act: their competitiveness is not only measured by local industrial foundations or market scale, but also by their capacity to provide institutional facilitations. In Beijing-Tianjin-Hebei, because the central state has long prioritized environmental concerns, Handan must strictly screen incoming industries and refrain from introducing high-pollution, high-energy-consuming projects to meet central requirements both for environmental protection and industrial upgrading. However, such gatekeeping inevitably drives some firms to cities where environmental regulations are more lenient (Informant 8). This demonstrates the difficult balancing tradeoffs secondary cities face when attracting external resources: they must meet central demands, yet still depend on incoming industries to stabilize the local economy, forcing them to participate in regional competition with all kinds of constraints. Although the central state issued regulations for inter-city fair competition in 2024 to curb harmful

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preferential policies, these remain largely regulatory tools, lacking sufficient support, thus cannot fundamentally alleviate the competitive dilemmas among secondary cities (Informant 13).

Another deeper layer of passiveness lies in secondary cities' limited discretion over the industries they can realistically attract. As our interviewee noted, "it is already very difficult to find enterprises that both meet the standards and are willing to relocate" (Informant 3). Secondary cities often end up taking whatever comes their way, making it difficult to develop a coherent industrial system grounded in endowments and local specialties, and also undermining the implementation of ambitious metropolitan planning (Informant 7 & 8). Industrial clusters or functional corridors designed to highlight Handan's local characteristics largely remain on chapter. In practice, Handan's economic structure has become increasingly mediocre and fragmented: traditional coal and steel industries are declining under transformation pressures; cultural and tourism industries struggle to gain momentum; and other sectors remain disconnected. Thus, although secondary cities are encouraged to participate freely in open regional markets, their actual discretion is constrained by stronger external competitors, policy restrictions, and limited choices, further deepening their passiveness in competing for spillover resources.

5.5.3 Passiveness in partnering with the cores

Secondary cities are usually in a politically weak position, and this passiveness is visible in their attempts to partner with core cities. Core cities effectively hold the power to decide whom they wish to collaborate with, creating a clear power asymmetry. As a result, it is very difficult for secondary cities to establish formal partnerships with core cities between state actors on both sides (Informant 1 & 13): core cities often show little interest in responding to or engaging with smaller neighbors, they enjoy a wide range of alternatives and can compare potential partners based on political ties or urban endowments. By contrast, secondary cities can only fix their attention on those few top cores for recognition and support. Such selective incorporation has long been noted in the literature on power asymmetries in partnerships, where weaker actors risk being compelled to accept decisions made by stronger ones (Gray et al., 2022). Empirical studies on inter-city socioeconomic relations also show that core cities tend to capture more benefits from cooperation (Zhang et al., 2025). Consequently, the passiveness of secondary cities in regional coordination arises not only from limited capacity but from unequal partnerships with the cores.

The asymmetry of power further prevents secondary cities from obtaining the support they truly need, because core cities ultimately decide what resources spill over, and whether they spill over at all. For example, a leading Beijing research institute established a branch in Handan a decade ago and made some progress in agricultural production, but it has contributed little to Handan's urgent needs in industrial upgrading, technological transformation, and knowledge-based development (Informant 6). In this situation, the higher-level government of secondary cities provides limited assistance, in Handan's case, Hebei Province. On one hand, Beijing and Tianjin, as the capital and centrally administered municipalities, occupy even higher administrative hierarchy as the province, leaving the it with little leverage to negotiate. On the other hand, the province tends to prioritize support for secondary cities that have already demonstrated certain wins in inter-city competition, those with existing projects, investments, or established collaborations, in pursuit of a more visible "overall" success (Informant 1 & 3).

Furthermore, the insufficient metropolitan integration among urban entities within the prefectural city further weakens their capacity in regional competition. The emphasis on division of labor has produced fragmented institutional arrangements and competitive relations among intra-city entities. Districts, counties, or development zones prioritize their own interests. For example, Handan's strategy of promoting industrial clustering through an "enclave economy" was intended to optimize resource allocation, yet the two counties involved often fail to reach agreement on the distribution of tax revenues, fixed asset investment, or employment benefits (Informant 3). On the other hand, this fragmentation leads to isolated, uncoordinated efforts in investment attraction. Although Handan's prefecture-wide spatial planning aimed to avoid homogenization and redundant production, it has in practice intensified internal competition. Coordination framed around functional division has instead encouraged each entity to compete for more profitable industries, limiting resource sharing and complementary development (Informant 6). As a result, metropolization does not enable Handan to compete as a larger, integrated urban actor, but rather as a set of smaller, disconnected units, further diminishing its visibility when seeking external support.

5.6 Discussion and conclusion

This chapter uncovers how secondary cities mobilize entrepreneurial activities to survive mega-regionalization by translating coordination-oriented planning visions into local spatialization practices, using Handan as a representative case. The findings show that, although secondary cities are expected to benefit from coordinated relations with core cities, through access to external resources, the activation of internal potentials, and metropolization, these opportunities are constrained by their passive positions within mega-regional system, which further produces practical obstacles. First, they face difficulties in joining the mega-regional "club", as limited attractiveness and visibility hinder their full incorporation into regional networks. Second, constrained access to strategic resources forces them into zero-sum competition with other secondary cities and non-top cores, while insufficient discretion and fragmented internal conditions weaken their ability to participate regional market. Third, unequal power relations in regional governance result in selective incorporation by core cities, with resource distribution dominated by the cores.

The three forms of passiveness identified above can also be systematically understood through the lens of **horizontal governance mismatches** between core and secondary cities, articulated along the dimensions of place, priority, and actor. First, passiveness in joining the mega-regional "club" reflects a **place mismatch**, in which secondary cities are assigned vague or aspirational functional positions within mega-regional strategies, yet lack the material attractiveness, visibility, and institutional recognition required to be treated as meaningful partners by the cores. While formally included in regional frameworks, they remain marginal in practice, unable to translate spatial positioning into local benefits. Second, passiveness in competing for spillover resources corresponds to a **priority mismatch**. Mega-regionalization still prioritize market-oriented competition and efficiency, but this competitive logic privileges core cities because the advanced attractiveness, while secondary cities are simultaneously constrained in such context. As a result, secondary cities are pushed into intensified inter-city competition for scarce spillovers. Third, passiveness in partnering with the cores reveals an **actor mismatch**, rooted in asymmetric power relations among local state actors between core and secondary cities. Core cities retain decisive authority over partnership selection or the release of strategic resources, whereas secondary cities face a subordinate position. This asymmetry prevents secondary cities from shaping cooperation agendas and reinforces their dependency on selective incorporation by stronger actors.

Although we have only explored one secondary city, the practical obstacles revealed in this study are present in almost all secondary cities in Chinese mega-regions. For example, some mega-regions want to create a superstar city to serve as the symbol of prosperity and economic engine for the mega-region, which confirms our findings that unsaturated cores tend to keep their resources locally, through urban sprawl, and the establishment of industrial parks and satellite towns (Zhou & Yang, 2024). This is a path dependency that is difficult to break, encouraging the focus on cores for regional economic growth. So, the development of secondary cities mandated in visionary planning often remains on chapter, while concrete actions usually target the cores. From the perspective of secondary cities, the lack of endowment to realize their potential has been widely discussed, including their institutional system and innovation capacity (Dong et al., 2007). Besides, planning and policies insufficiently promote the transformation of smaller cities due to mismatches between the concerns of the plans and the specific conditions of these cities.

Also, they align with the difficulties faced by smaller urban entities in city-regional governance globally. For example, the lagging coastal towns of the UK have not been revitalized by new activities and are negatively characterized in public policy and media discourse, which is partly attributed to the weak political voice of smaller cities in the regional system (Fiorentino et al., 2024; Wenham, 2020). In the context of Europe's strong political orientation towards territorial cohesion, scholars have found that small and medium-sized cities that are located within core metropolitan areas have the opportunity to benefit from regionalization through recreational livability, accessibility to transportation networks, and efficient public administration, while those outside core areas are increasingly left behind as resources concentrates in the cores, making it harder for them to sustain their own development priorities. This inevitably increases regional unevenness reflected in multidimensional polarization and peripheralization (Kunzmann, 2010; Weck & Beißwenger, 2014).

These problems are not unsolvable, and some cases of successful spatialization of regional planning give us some confidence towards mega-regional coordination. Previous studies have focused on the revitalization path of secondary cities at three levels. The first is the integration with neighboring smaller cities that are also in a disadvantaged position to form an alliance and jointly resist the development pressure brought by the rise of cores. For example, Black County, a city cluster in the Birmingham metropolitan area, declining under the wave of industrial upgrading, has consolidated political centrality through the integration of smaller urban centers. In this way, the Black County is recognized as a region and has gained as much attention as the core city of Birmingham (Pradel-Miquel, 2015). Another revitalization path is provided by the 2008 EU regional development report Turning Territorial Diversity into Strength, which aims to promote the potential of small and

medium-sized cities by encouraging their integration into multi-level governance frameworks towards territorial cohesion and polycentric regionalization (Servillo et al., 2017). This represents external support based on vertically integrated resources, such as funding from higher levels of government or devolution of powers to the local scale. There are also horizontal city partnerships, albeit more informal and framed by specific themes, as competition is still the dominant interaction between cities (Weck & Beißwenger, 2014). Finally, the optimization of the internal economic structure, including real estate and services is a driving force for secondary cities (Fahmi et al., 2014). This often relies on branding to counter the long-standing negative stereotypes of "backward" cities. In cases like Nantes, France, for instance (Audouin, 2022), regionalization provides a branding opportunity for the medium-sized city to integrate its unique selling points (sense of community, livability, and creativity) within a strong and rich regional system (Kunzmann, 2010).

Therefore, the entrepreneurial activities theoretically provide Handan and similar secondary cities with a gateway to embed itself within the mega-regional system and respond to intra-regional unevenness: Externally, secondary cities gain from new functions, symbolic elevation, and increasing recognition. Internally, Internally, progress is driven by the upgrading of traditional industries and the cultivation of new cultural, tourism, and innovation capacities. Metropolization further reinforces these changes by structuring industrial clusters and opening spatial platform for wider market interaction.

However, multidimensional passiveness hinder the effective implementation and functioning of these spatialization pathways. In this regard, addressing such passiveness should become a central concern in the future mega-regionalization. On one hand, core cities should be further mobilized to establish more equal and collaborative relations with secondary cities, while secondary cities, drawing on their own comparative advantages, should seek appropriate functional positions within the regional market. However, this does not imply that competition-oriented growth models should be further encouraged. Instead, cooperative models based on mutual benefit should be further explored. Moreover, support from core cities to secondary ones should become more targeted and responsive to the specific conditions and needs of these smaller players, with the aim of fostering a more inclusive and balanced regional system. On the other hand, from the perspective of secondary cities themselves, the effective integration of developmental resources is crucial. For instance, in the process of metropolization, constructive interaction among urban entities should be established, rather than a mere division of labor lacking substantive dialogue.

Our research contributes to the existing literature on planning implementation in secondary cities at two levels. We innovatively examine mega-regionalization, including its spatial consequences, socio-economic impacts, and implementation pathways from a bottom-up perspective under the state entrepreneurialism framework. We explore how these cities respond to the top-down policies of mega-regionalization by compiling the entrepreneurial activities they pursue to spatialize central state goals. In parallel, our field research and interviews with local officials uncovers a series of passiveness of secondary cities in this process. This not only systematically theorizes the difficulties of secondary cities in navigating mega-regionalization as the vision of central state's vision, but, more importantly, provides lessons for regional policies and spatial planning optimization. We argue that, as secondary cities increasingly become key players in balanced and sustainable regions, policymakers should pay more attention to their challenges and facilitate the realization of their visions by engaging with their bottom-up perspectives. In this way, mega-regionalization can benefit secondary cities and they can also contribute to a complementary, polycentric mega-regional system.

Appendix

Informants list

Informants	Role	COE	CON	COO
Informant 1, interview (1) and policy documents sharing	Local official in financial and investment management		√	√
Informant 2, policy documents sharing	Local official in comprehensive urban planning, development and governance	√	√	√
Informant 3, interview (2)	Local official in industrial development and transformation	√		√
Informant 4, interview (3) and policy documents sharing	Local official in comprehensive urban planning, development and governance	√	√	√
Informant 5, interview (4)	Local official in comprehensive urban planning, development and governance	√	√	√
Informant 6, interview (5) and policy documents sharing	Local official in industrial development and transformation	√		√
Informant 7, interview (6)	Local official in urban planning and spatial actions arrangements	√	√	
Informant 8, interview (7) and policy documents sharing	Local official in comprehensive urban planning, development and governance	√	√	√
Informant 9, interview (8) and policy documents sharing	Local official in comprehensive urban planning, development and governance	√	√	√
Informant 10, interview (9)	In charge of industrial development and transformation	√		√
Informant 11, interview (10)	Local official in tourism development and management		√	√
Informant 12, policy documents sharing	Local official in agriculture development and management	√		√
Informant 13, interview (11)	Experts in regional planning	√	√	√
Informant 14, interview (12)	Experts in regional planning	√	√	√
Informant 15, answering questions via texting	Local official in comprehensive urban planning, development and governance	√	√	√
Informant 16, answering questions via texting	Local official in comprehensive urban planning, development and governance	√	√	√
Informant 17, answering questions via texting	Local official in industrial development and transformation	√		√
Informant 18, answering questions via texting	Local official in industrial development and transformation	√		√

All informants are either senior officials (department leader of municipal/ county governments) or professors/senior scholars. Specific titles are omitted to preserve anonymity;
The informants' specific fields cover all three categories of COE/ CON/ COO, to ensure that the collected data can be comprehensively described mega-regional coordination.

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In 2018, a large commercial complex was newly completed and opened in Handan, emerging as a key node for urban consumption and social vitality. Just across the street, a landmark cultural and arts center was also newly built. Together, they form a new cultural-commercial district that serves as an emerging urban icon, attracting visitors from surrounding areas while stimulating local consumption.

The new cultural-commercial district in Handan, photographed by Kaixuan Wen.

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6 Conclusion and discussion

Uncovering governance mismatches in Chinese mega-regionalization towards core-secondary coordination

ABSTRACT This chapter reflects on the challenges faced by secondary cities in Chinese mega-regional development, highlighting three key types of governance mismatches – place, priority, and actor – across vertical and horizontal governance trajectories. Vertically, mismatches stem from the disconnection between top-down visions and local implementation capacity, resulting in ineffective coordination and policy misalignment. Horizontally, they reflect unequal power relations between core and secondary cities, leading to fragmented collaboration and limited shared goals. The analytical framework of place, priority, and actor, is derived from a critical reflection on three classic approaches: network externalities, inter-city cooperation, and multi-level governance. Revisiting these frameworks in light of research on Chinese secondary cities, the study reframes their role through a relational spatial lens and develops an analytical tool to identify and interpret governance mismatches. We conclude with policy recommendations for stakeholders at different levels. Vertically, we propose a flexible governance framework that breaks oversized mega-regions into manageable sub-systems, designs control mechanisms to balance competition and collaboration, and empowers top-level actors as mediators to reduce coordination costs. Horizontally, we recommend strengthening core-secondary partnerships by recognizing the internal complexity of secondary cities as urban regions, promoting learning-based collaboration, and encouraging shared goal-setting mechanisms to amplify their voice in mega-regional coordination.

KEYWORDS Mega-regionalization; secondary cities; governance mismatches; network externality; inter-city cooperation; multi-level governance.

6.1 From context to problem summary

The rise of mega-regionalization marks the emergence of inter-city systems as new platforms through which socio-economic activities engage with global markets (Florida et al., 2008; Harrison & Hoyler, 2015). Over the past two decades, such systems have been extensively explored in terms of functional linkages, joint governance, and spatial integration (Lu et al., 2020; Pain, 2011; Priemus & Hall, 2004). While much attention has been given to celebrating the economic achievements brought by mega-regions, a critical bottleneck has gradually gained recognition: the problem of **intra-regional unevenness** (Cardoso & Meijers, 2017; Qin et al., 2023). On one hand, increasingly intensified inter-city linkages have facilitated the rapid circulation of various socio-economic drivers. These resources tend to concentrate in the core of mega-regions, often one or more central metropolises, while smaller and more peripheral urban entities face the risk of developmental hollowing-out represented by the loss of population, functions, or investments (Cao et al., 2023; Pavlaković-Koči & Pejnović, 2005). On the other hand, these cores frequently receive policy favoritism, as governments at all levels tend to rely on them as growth engines to enhance the region's competitiveness in the global arena (Li & Jonas, 2023). Consequently, mega-regionalization is often accompanied by growing disparities between core metropolises and smaller urban entities within the region.

Within mega-regional systems, we conceptualize these smaller, non-core players as **secondary cities**. Although scholars have yet to reach a unified definition, the term reflects a well-understood sense of "*other cities, the less recognized, less celebrated cities, and located next to the famous cities that gather all the attention*" (Pendras & Williams, 2021, 1). Our use of the term "secondary" aims to emphasize their uneven relations with cores, rather than to imply a hierarchical ranking based on socio-economic indicators.

Despite the increasing acknowledgement of unevenness as a major challenge in Chinese mega-regions (Li & Jonas, 2023), they are still regarded not only as spatial concentrations of diverse socio-economic activities, but also as recentralized governance processes to (ideally) address unevenness (Wu, 2016). This process often envisions the coordination of various **spatial relations** between core and secondary cities (Du et al., 2024b). Specifically, scholars have extensively discussed three dimensions of core-secondary spatial relations within mega-regionalization. First, the *morphological polycentricity* of regional structures: cities of various sizes are envisioned to play important roles in a system of cities, aiming to constrain overly hierarchical and monocentric spatial configurations, and instead promote

the emergence of networked regional systems (Chen et al., 2021; Halbert, 2008). Second, the *multi-directionality of spatial flows*, which serves as a vital driver for polycentric regional systems. Strengthening spatial linkages between cities is expected to facilitate multidirectional flows of people, capital, and information, thereby fostering positive regional externalities (Karlsson & Gråsjö, 2021). Third, the *functional complementarity* among cities: rather than relying solely on size or political status, regional division of labor is increasingly shaped by the specialized functions and distinctiveness of different urban entities. Functional differentiation contributes to a complementary network structure that enhances regional efficiency and coordination (Burger et al., 2014).

These three objectives position the governance of core-secondary spatial relations as one of the key mechanisms for addressing uneven development. As such, it is often regarded as a panacea for intra-regional disparities in China. Since 2006, the national authorities tried to address the significant intra-regional disparities caused by the growth pole model by promoting the coordinated governance of mega-regionalization as a new territorial strategy (Yeh & Chen, 2020; Ke & Feser, 2010; Fan & Sun, 2008; CNDRC, 2006). With inter-city coordination as its central objective, this strategy aims to promote spatial relations characterized by positive interactions between core and secondary cities. Mega-regionalization thereby becomes, evidently, **a governance process** rather than merely the formation of a new spatial unit. The state has actively steered this agenda through various spatial planning initiatives, emphasizing top-down approaches to realize the vision of mega-regional development (Harrison & Gu, 2023; Yeh & Chen, 2020). A key aspect of this effort is to rebalance regional systems by repositioning secondary cities, both functionally and politically, within the broader regional system.

However, two decades after mega-regions were institutionalized as the primary vehicle for Chinese regional development, the unevenness faced by secondary cities has not been efficiently alleviated (Du et al., 2024a). Their functional and political positions have not improved meaningfully: many secondary cities continue to grapple with industrial decline and the urgent need for structural transformation, while cores, entrusted with key responsibilities, have benefited from a wide range of supportive policies that reinforce the path dependency of the growth pole model (Long & Gao, 2019). We identify two main challenges of secondary cities. First, **polarization**: due to their limited attractiveness, development resources such as talent, industry, and investment tend to flow outwards from secondary cities and concentrate in core cities, leading to increased socio-economic gaps. Second, **peripheralization**: political attention and resources are overwhelmingly directed toward core cities, given their higher perceived development potential. As a result, secondary cities gradually lose political voice and become increasingly peripheral in policy discourse.

In summary, in response to the challenges of intra-regional unevenness, the authorities have proposed promising pathways for coordinating core-secondary spatial relations. However, these visions have not delivered successful results. Against this problem, this doctoral dissertation seeks to address the central research question: **To what extent can the coordination of core-secondary spatial relations help secondary cities navigate mega-regionalization in the face of polarization and peripheralization?**

This question is addressed through four steps. First, in Chapter 2, adopting a **typological approach**, we classify Chinese secondary cities based on their uneven developmental conditions. This enables a more nuanced understanding of the diverse characteristics and place-specific challenges faced by different types of secondary cities, moving beyond their treatment as a generic type. Building on this foundation, the investigation proceeds through three multi-scalar analyses encompassing the national, mega-regional, and city levels:

In Chapter 3, we focus on the **national level** to explore the policy agendas and top-down spatial visions initiated by the state authorities. These strategic plans embody the state's expectation to promote coordination between core and secondary cities and offer opportunities for secondary cities to overcome polarization and peripheralization. We deconstruct the policy orientations into three levels, namely coexistence, connectivity, and cooperation. In this way, we investigate the governance mismatches that hamper their capacity to promote coordinated core-secondary spatial relations.

In Chapter 4, we focus on the **mega-regional level**, considering that, although national strategies highlight the role of secondary cities, these broad and generic visions must be translated into more concrete action plans at the mega-regional scale. The study thus explores the extent to which secondary cities are granted meaningful roles in negotiating the envisioned coordination. We focus on mega-regionalization as a governance process transmitted from national authorities to the local level through intermediate scales, thereby identifying *vertical governance mismatches* in this process.

In Chapter 5, we focus on the **secondary city level**, using a representative case to examine how both national strategic visions and mega-regional operational action plans are implemented in practice, offering deeper insights into the real-world obstacles faced by secondary cities. We analyze how the city of Handan establishes collaborative relations with the surrounding cores to realize the envisioned mega-regional coordination and foster deeper integration, with particular attention to the practical obstacles they encounter, which manifest as *horizontal governance mismatches*.

The following sections provide a synthesis of the key findings in response to the research question, outline the main contributions of the study, and reflect on its broader implications through policy recommendations and critical insights.

6.2 Key findings

6.2.1 In-depth contextualization: three problematic core-secondary spatial relations

Although the challenges of mega-regional unevenness have attracted growing attention from both scholars and policymakers, the developmental role of core cities continues to be widely emphasized, while the difficulties and potential of secondary cities remain insufficiently explored (Kaufmann & Wittwer, 2022). In fact, secondary city is not a commonly used term in the Chinese context, and there is no standardized list identifying which cities fall under this category. In this research, we define centrally administered municipalities, provincial capitals, and sub-provincial cities as mega-regional cores, as these cities not only enjoy higher administrative ranks but also typically exhibit stronger socio-economic performance. All other prefecture-level cities located within mega-regional systems are classified as secondary cities. This classification aligns with prior research on Chinese regional dynamics, where such cities have been variously referred to as “ordinary cities” or “non-central cities” (i.e. Gao et al., 2024; Wang & Zheng, 2024).

However, such a superficial classification risks overlooking the considerable diversity among secondary cities. Therefore, we differentiate them into types by employing a typological analysis based on the developmental gap between them and their respective core cities. Development here refers not merely to economic growth, but a broader, multidimensional framework of high-quality development encompassing six dimensions (Du et al., 2024a): economic performance, social vitality, innovation capacity, green transition, regional embeddedness, and industrial structure. The results returned five types of secondary city. Cities such as Dongguan in the Greater Bay Area and Changzhou in the Yangtze River Delta serve as representatives of competitive secondary cities. As advanced manufacturing hubs closely related to the cores, they demonstrate strong performance in social vitality and innovation, while

maintaining robust economic growth (Dennis Wei et al., 2011). Another type exhibits a moderate developmental gap from their respective cores. Cities like Luoyang and Nanyang surrounding Zhengzhou in the Central China mega-region, represent benchmark cases of relatively balanced core-secondary relations (Du et al., 2024a).

However, the typology also identifies three **problematic** types of secondary cities that face significant challenges relative to their core cities. They are the primary focus of further exploration:

- The first type, exemplified by the Chengdu-Chongqing mega-region, represents a pattern of "**large metropolises vs. tiny players**". The feature of this core-secondary relation lies in the remarkable disparities in both urban size and embeddedness within regional networks. As a result, the developmental trajectories of the smaller cities are highly dependent on the paths taken by the dominant metropolises (Gou & Liu, 2022). Mega-regional planning in this context has emphasized the need to promote spatial integration among smaller cities themselves towards a more balanced regional morphological pattern.

- The second type, present in the South-central Liaoning mega-region, represents a situation of "**weak core vs. weaker secondary cities**". In a purely quantitative sense, the development gap between core and secondary cities in this category may not appear dramatic; they maintain at a *seemingly* moderate level. However, this does not reflect well-functioning or balanced spatial relations. Instead, both core and secondary cities face a shared crisis of socioeconomic decline (Zhang, 2008). Mega-regional strategies in this context often involve channeling additional resources into cores to stabilize overall regional competitiveness, which inadvertently undermines the developmental potential of secondary cities (Yin, 2018).

- The final type, represented by the Beijing-Tianjin-Hebei mega-region, is characterized by "**secondary cities under the metropolitan shadow**" . These secondary cities are not necessarily small (Handan, for example, has a population approaching ten million), but suffer from a gradual outflow of development resources due to the overwhelming pull of "superstar" cores like Beijing (Li & Jonas, 2023). A significant challenge for these cities is the lack of political voice, which hinders the formation of balanced and cooperative inter-city relations.

6.2.2 Framing the conceptual framework: governance process, policy orientations, and potential governance mismatches

In response to the unevenness challenges confronting secondary cities, Chinese mega-regionalization can be conceptualized **as a recentralized regional governance process aimed at coordinating core-secondary spatial relations** and primarily operationalized through visionary planning (Harrison & Gu, 2021; Li & Wu, 2020). On one hand, this process mobilizes cores to actively participate in the coordination framework by emphasizing their leadership roles. On the other hand, secondary cities are (at least in the planning) empowered with more significant responsibilities, grounded in the support of the respective core cities and the activation of their own developmental potential.

This visionary plans are typically broad and generic, outlining general long-term directions for coordination without offering concrete implementation guidelines (Du et al., 2024b; Harrison & Gu, 2021). As a result, an **intermediate stage** emerges between the top-level strategic vision and bottom-level local implementation. At this stage, provincial governments or relevant state agencies often act as coordinators to translate the long-term visions into short-term goals and concrete operational action plans to coordinate core-secondary relations specifically, thereby guiding implementation at the local scale (see Chapter 4). Within this process, secondary cities are strategically repositioned to play more advanced functional or political roles, facilitating their integration into the spatial networks of regional development. At the local scale, secondary cities respond to their assigned roles in the operational action plans by executing a series of spatial strategies, interventions, and actions, which can be seen as the process through which the coordination vision is spatialized on the ground.

Under the guidance of this top-down **vertical** coordination trajectory, the formation of coordinated core-secondary spatial relations also triggers a **horizontal** governance trajectory. This refers to the efforts made, within the broader framework of mega-regional visionary planning, to build, strengthen, or optimize positive interactions between core and secondary cities. The drivers of such interactions may vary. In some cases, they are shaped by state regulation, as seen in Beijing's decentralization of redundant urban functions to surrounding smaller cities (Tang & Meng, 2021). In others, they are supported by market dynamics, such as when secondary cities serve as manufacturing supply bases within regional industrial chains, with the core city functioning as the target market (Rolf, 2019).

From the perspective of secondary cities, the coordination pathway entails the local **spatialization** of both the broad goals outlined in visionary plans and the more concrete arrangements developed at the mega-regional level. In practice, this involves translating visions into a series of actions, strategies, and interventions, such as the extension of transportation infrastructure, the development of industrial clusters, or the reinvention of local city branding. In addition to actively pursuing the goals of mega-regional coordination, secondary cities also respond to the initiatives and behaviors of core cities, thereby improving their capacity to absorb spillover resources or benefit from the external support.

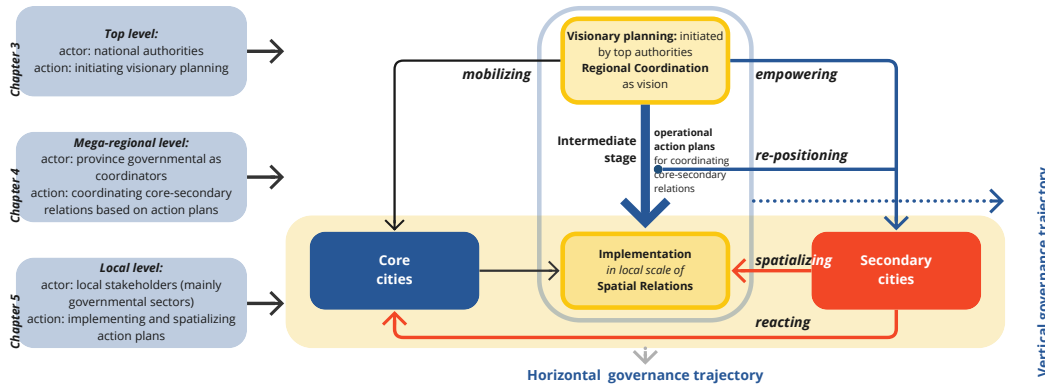

FIG. 6.1 Mega-regional governance to coordinate core-secondary spatial relations

In summary, Chinese mega-regionalization can be understood as a governance process oriented toward **core-secondary coordination**. This concept can be structured into three interrelated dimensions (see Chapter 3):

- **Coexistence**, which means the development of both core and secondary cities must follow certain principles and rules and should not come at the expense of one another. This includes functional division of labor designed to prevent excessive concentration of resources or zero-sum games, as well as consideration of broader issues such as energy use and environmental sustainability (Fang, 2015; Fang & Yu, 2017).

- **Connectivity**, which refers to the foundational carriers of relations. This dimension emphasizes the need for dense and positive interactions between cities, ranging from physical infrastructure linkages to the flow of information and the openness of regional markets (Lin et al., 2019; Tongjing & and Meijers, 2024).

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— **Cooperation**, which entails joint actions or collaborations between core and secondary cities, often institutionalized through formal agreements. Examples include co-development of industrial platforms, shared use of public facilities, and collaborative initiatives in innovation and talent development (Lingfan et al., 2025).

It is because mega-regional governance emphasizes these three dimensions that the vision of core-secondary coordination becomes actionable, and secondary cities are given the opportunity to integrate into and benefit from the broader regional development process.

However, these promising planning initiatives have not effectively alleviated the unevenness between core and secondary cities. We attribute this to **governance mismatches**, namely, misalignments across levels of governance and related stakeholders that prevent coordination vision from being successfully translated into operational action plans for further implementation, as well as the establishment of coordinated relations between core and secondary cities. These mismatches manifest in three dimensions regarding place, priority, and actor. Based on this conceptual framework, we focus on the problematic cases of core-secondary relations identified in Chapter 2 to examine and verify how these governance mismatches constrain the realization of coordination visions. In chapters 4 and 5, we draw on the 3-CO framework to analyze, respectively, the vertical and horizontal dimensions of coordination implementation, and further unpack the governance mismatches across the three levels of place, priority, and actor.

6.2.3 Vertical governance mismatches

The vertical governance trajectory refers to the top-down process in which the visionary planning initiated by the national authorities is translated at the mega-regional level into short-term objectives and actionable plans. This is primarily manifested in the planning of the overall spatial configuration of regional development, improving regional accessibility, and the top-down spatial redistribution of urban functions.

TABLE 6.1 Vertical governance mismatches

Vision	CO-existence	CO-nnectivity	CO-operation
Implementation	Determining spatial configuration	Improving region accessibility	Redistributing urban functions
Place: Top expectation of polycentricity not in line with local condition	Top-down planning vision of polycentricity lacks local feasibility and efficient support, leading to fake inclusion.	Connectivity reinforces core dominance, while secondary cities (may) fail to capitalize on improved access.	The assigned roles often lack contextual adaptation to the local condition. Also mismatch between responsibilities and resources.
Priority: The growth of cores is often prioritized at the intermediate stage	Core-centric growth strategies marginalize secondary cities, leading to over-concentration of the cores, reinforcing the mono-centric regional pattern.	Inter-core linkages dominate transport planning, the nearby secondary cities receiving more opportunities, reducing the strategic visibility of peripheral ones.	Core cities are typically allocated high-value functions and are prioritized to achieve, undermining the complementary cooperative relations with secondary cities.
Actor: Insufficient institutional system for coordination	Although top-level planning assigns roles to secondary cities, the incremental changes often results in a shift during implementation, with action plans increasingly cantered on the development of cores.	While infrastructure expansion improves physical accessibility, the multidirectional spatial interactions are still yet realized, reinforcing unidirectional concentration toward core cities.	Lack of binding institutional mechanisms and targeted guidance lead to ineffective support from core cities, undermining the willingness of inter-city collaboration.

However, the expectations of national authorities do not always consider local conditions and needs, giving rise to what we identify as a place mismatch. Visionary plans often aim to construct polycentric regional models, assigning secondary cities more prominent functional roles. Yet, in the absence of realistic feasibility and effective support, such visions often fail to materialize. For example, the Chengdu-Chongqing mega-regional plan envisioned the spatial integration of small cities to tackle the problem of unevenness in size among cities. Mega-regional authorities proposed the integration plan among smaller cities such as Yibin-Luzhou and Nanchong-Dazhou. These smaller cities showed little interest in such initiatives, as they had limited capacity to benefit from each another. Instead, their policy orientation is clearly directed toward engaging with the two dominant cores (e.g. BNR Nanchong, 2021). This misalignment with local realities also often means that improved regional accessibility and elevated functional positioning fail to deliver tangible benefits to secondary cities but exacerbate the outflow of development resources (An et al., 2022). As a result, such upgraded roles often remain rhetorical commitments rather than actionable strategies, bringing limited practical benefit to secondary cities.

The failure to realize the vision for secondary cities also stems from diverging priorities of provincial governments coordinators in the mega-regional level. As discussed earlier, Chinese mega-regions are often more planning imaginaries than well-integrated functional systems, asking for more concrete action plans to translate the vision to concrete actions and strategies arrangements (Harrison & Gu, 2021). The provincial governments as coordinators tend to maintain a strong focus on cores as primary economic engines, reflecting a deep-seated path dependency on the growth pole model, to enhance the overall competitiveness of the mega-region. Competition among mega-regions is still intense, and consolidating resources around the cores is an effective way to preserve regional status and avoid further decline (Yin, 2018). In the case of the South-central Liaoning mega-region, for instance, Shenyang is envisioned by coordinators as the future central city of Northeast China, reinforcing a monocentric structure. A priority mismatch arises from how mega-regional coordinators reinterpret the top-level visions. While the latter plans emphasize the importance of secondary cities within a coordinated regional system, coordinators at mega-regional level often consider the development of a strong core city to be of greater strategic urgency. The focus on cultivating a powerful growth pole is often rationalized as a prerequisite for eventual coordination, that is, once the core is strong enough, it would radiate benefits to surrounding secondary cities. However, this "next step" rarely materializes in practice (see Chapter 4).

The mismatches of place and priority can be attributed to the inappropriate expectations placed on secondary cities in top visionary planning, and the selective interpretation at the mega-regional scale of the coordination vision. Within this process, governance has failed to fully leverage the power of resource allocation and regulation, thus resulting in actor mismatch. The national authorities aim to rebalance the uneven relations between core and secondary cities. However, they do not actively participate in this process. Instead, mega-regional coordinators possess the power to determine short-term spatial actions, allowing for "incremental adjustments" to the original coordination vision (see Chapter 4). These adjustments often shift the focus from both core and secondary city development to a prioritization of cores. In the absence of higher-level enforcement, such collaborative relations depend largely on the voluntary engagement of cores and the competition among secondary cities to attract spillover resources. Wu (2016) refers to this condition as a "regulatory deficit". In summary, the actor mismatch refers to the disconnect between the top-down coordination visions and the absence of institutional mechanisms to regulate implementation or reconcile competing stakeholder interests.

6.2.4 Horizontal governance mismatches

The horizontal governance trajectory is relevant during the implementation of planning actions, especially from the secondary cities' perspective. Specifically, it involves the (re)definition of spatial development pathways as guided by assigned functional roles, sharing regional branding based on market openness and physical infrastructure, and the absorption of functional spillovers from cores.

TABLE 6.2 Horizontal governance mismatches

Vision	CO-existence	CO-nnectivity	CO-operation
Implementation	Receiving and fulfilling functional roles	Branding promotion based on infrastructure connection	Undertaking/ co-cultivating industrial clusters
Place: Lack of motivation and inner capacity	Functional roles are vaguely defined; weak guidance leads to disjointed relations and uncoordinated implementation.	Secondary cities lack inner capacity in materialize the regional brand in the over competition-oriented context.	Core cities lack motivation to empower secondary cities, who also lack capacity to absorb industrial functions or to co-construct industrial clusters.
Priority: Market competition is prioritized for greater profitability	Cores prioritize their own gains; their policy agendas and resource allocations are primarily oriented toward enhancing local competitiveness rather than fostering integrated regional development.	Only top-tier core cities exhibit capacity for resource spillover, while the envisioned inter-city connectivity and regional brand sharing in mega-regional plans often remain aspirational. Secondary cities increasingly seek partnerships with core cities outside their own region, triggering unregulated competition among secondary cities across mega-regions.	Secondary cities prefer to accommodate high-end industries, cores prefer to keep advanced resources within their metropolitan boundaries.
Actor: Cores have power to "choose" the approach and partnership			Core cities dominate the cooperation process, the secondary cities selected by the cores can gain more opportunities, others are left-behind.

In the horizontal dimension of inter-city relations, core cities often lack the willingness or motivation to provide meaningful support. In the Beijing-Tianjin-Hebei mega-region, secondary cities had proposed the development of a "Capital Ring Economic Belt" more than a decade ago. However, Beijing's response remained ambivalent, and little meaningful progress has been made (see Chapter 4). The development of coordination relations relies largely on the policy intentions of cores and the competition among secondary cities, resulting in inefficient and fragmented horizontal coordination. On the other hand, secondary cities often lack the internal capacity and the necessary endowments to materialize planning interventions. For example, although Beijing has been encouraged to relocate redundant industries to surrounding areas, our interviews reveal that accommodating these industries requires a range of enabling conditions: access to markets, adequate infrastructure,

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raw material supply, skilled labor, and technological capabilities, all of which present new challenges for secondary cities (see Chapter 5). Furthermore, secondary cities often attempt to extend their industrial space by leveraging regional branding or partnering with cores to develop industrial spatial platforms. However, this has frequently resulted in overdevelopment and underutilization, as many of these cities lack the investment appeal to match the symbolic power of the regional brand.

Regarding priority mismatch, despite the rhetorical emphasis on inter-city cooperation, market competition continues to dominate core-secondary relations at the local scale, as it is perceived to generate greater profitability. This explains why core cities often exhibit low motivation to engage in coordination initiatives: securing their own economic competitiveness remains their most pressing local political task. This is, to some extent, reinforced by the vertical governance trajectory. The desire of mega-regional coordinators to cultivate superstar cores has led them to silently accept, or even encourage, cores to prioritize their own growth agendas. In the Beijing-Tianjin-Hebei mega-region, our interviews revealed that all cities, including Tianjin and Shijiazhuang both of which are sub-core cities, are eager to establish partnerships with Beijing and absorb the industries being relocated from the capital (BNR Tianjin). Yet these cities fail to play a leading role in facilitating regional collaboration. Instead, they find themselves competing alongside smaller cities to capture spillovers from the dominant core. Although mega-regional coordination emphasizes inter-city cooperation, the persistent growth-first logic ensures that core cities remain privileged in both vertical planning agendas and horizontal governance trajectories.

Finally, actor mismatches in horizontal governance emerge from the lack of political voice of secondary cities. Evidence lies in the cores' selective engagement with certain secondary cities in forming partnerships, demonstrating their dominant position. Under strong national policy endorsement, these "selected" secondary cities have undoubtedly received greater political favor and developmental support. In addition, the metropolization strategies pursued by cores often incorporate adjacent smaller cities into their urban regional systems, for example, in the cases of Chengdu and Deyang, or Shenyang and Fushun. These secondary cities have opportunities to integrate their administrative systems, infrastructure networks, or social service systems with their respective cores. Together, these selective partnerships have produced differentiated futures among secondary cities. Those that are not chosen are increasingly peripheralized.

6.3 Reflection: factors exacerbating governance mismatches

This research does not begin with theoretical assumptions regarding the operational logic of mega-regional systems such as spatial networking, market competition, or agglomeration effects. Instead, our point of departure is observational, namely the coordination vision as expressed in spatial planning, and its translation into concrete implementation processes. The interpretation of planning frameworks and their practical application constitutes the primary data and material for analysis. The identification and conceptualization of governance mismatches are grounded in this approach, forming a structured framework for understanding the fragmentation between planning ideals and governance realities.

While the main objective of this study is to examine why mega-regionalization, despite being a promising planning vision, struggles to coordinate core-secondary spatial relations, we do not intend to dismiss the broader governance process beyond these relations that may have other aims and concerns, nor the decisions, interventions, and actions taken by various stakeholders involved in implementing the vision. Rather, the outcomes for core-secondary relations are often the result of careful contextual trade-offs between several parallel aims, shaped by a combination of administrative actions, market trends, and institutional conditions. More simply, the emergence of place, priority, and actor mismatches should not be blamed solely for any single actor or policy aim. Each actor operates from its own positionality, navigating complex regional dynamics amid intense external pressures, especially those driven by market forces, while making decisions they perceive as strategically necessary or beneficial. For example, the preference of mega-regional coordinators for stronger cores should not be understood merely as an overemphasis on growth. For many, the fear is that without a powerful core, development resources and economic momentum might drift toward other competing mega-regions (Yin, 2018). Based on this, this section seeks to situate the three identified governance mismatches within broader scholarly discussions on economic, geographical, and governance-related logics and principles. By doing so, we further examine the underlying factors that have made these mismatches particularly difficult to address within the trajectory of Chinese mega-regionalization.

6.3.1 Place mismatch: the unrealistic expectations of network externalities

We often take for granted the assumption that national authorities should support secondary cities by allocating more resources, and that cores should contribute to coordination through industrial relocation, knowledge diffusion, or co-development of economic clusters (see Chapter 3). This assumption has been widely discussed in mega-regional studies through the lens of **externalities** (Burger & Meijers, 2016; Meeteren et al., 2016).

In China, place mismatch is sometimes attributed to differences in the developmental stages of various mega-regions (Tian et al., 2023). In "mature" regions such as the Yangtze River Delta and the Greater Bay Area, functionally complementary inter-city relations have emerged, enabling smaller cities to experience rapid growth as manufacturing hubs supporting core cities (Liu et al., 2022; Tian et al., 2010; Zhao & Zhang, 2007). Benefiting from years of accumulated industrial foundations, these secondary cities have more recently begun transitioning toward high-end manufacturing and service sectors (Wang et al., 2016). This trajectory is often viewed as a paradigm of secondary cities benefiting from mega-regionalization and has been widely referenced in other mega-regional planning strategies (see Chapter 4). Cultivating a strong core is thus seen as a necessary governance step toward coordination, contributing to a deeply entrenched path dependency. However, in reality, this path dependency intensifies the core-secondary unevenness. The assumption that secondary cities will eventually benefit from spillover effects driven by network externalities once the core becomes "strong enough" may in fact imply a wait of several more decades, if it happens at all.

Externalities, by definition, were initially used to describe the benefits arising from the spatial concentration of firms (Isard, 1956). An externality *occurs if an innovation or growth improvement implemented by a certain enterprise increases the performance of other enterprises without the latter benefiting enterprise having to pay (full) compensation* (Burger et al., 2009). Clearly, these externalities are largely spatially bounded, operating over limited geographic ranges and typically following **gravity-based** interaction patterns: the greater the distance, the weaker the beneficial interaction (Meeteren et al., 2016).

This aligns with our observations: secondary cities located closer to the core are more likely to benefit from externalities, while cities situated at the geographical periphery of mega-regions experience far fewer benefits. According to local officials, being included in the formal boundaries of a mega-regional plan does not necessarily mean attention or support from core cities (see Chapter 5). Our study further

reveals that administrative boundaries play a critical role in mediating agglomeration externalities. Core cities often tend to retain their development resources within their own jurisdictional boundaries, such as by relocating industries to satellite towns within the same administrative unit. This makes it exceedingly difficult for secondary cities located outside these boundaries to benefit from spillovers. Such benefits, when they do occur, are typically the result of either top-down political directives or mutual attraction between core cities, which generate opportunities for "in-between" secondary cities. However, most secondary cities remain peripheralized. Therefore, instead of questioning whether core cities are "strong enough" to distribute spillovers more broadly, it is more critical to reflect on the overambitious scale of the Chinese mega-regional system.

Successful regionalization strategies aimed at promoting inter-urban balance, such as the Randstad in the Netherlands, are significantly smaller in scale (Priemus, 1994). In fact, very few mega-regional initiatives around the world rival the territorial ambition of Chinese mega-regional plans (Harrison & Hoyler, 2015). The distance from Beijing to Handan is roughly 400 kilometers, which is considerably farther than the distance between two separate urban regions of the Randstad and the Düsseldorf-Cologne corridor. It is hardly conceivable that agglomeration externalities from Amsterdam could enhance investment or industrial growth in a small German city like Koblenz. Under such spatially unrealistic regional scales, mega-region becomes a symbolic concept rather than functionally meaningful.

In an ideal scenario, if commuting time between cities were infinitely compressed, it would seem possible to overcome the spatial limitations of agglomeration externalities. Building on this premise, scholars have turned their attention to an alternative form of externality: **network externalities** (Meeteren et al., 2016). This concept is typically distinguished from agglomeration externalities across three analytical dimensions:

- From an **industrial organization perspective**, agglomeration externalities refer to the benefits that firms within a single urban cluster derive from shared infrastructure and mutual support, often characterized as public goods freely accessible to all within the cluster (Burger et al., 2009). In contrast, network externalities arise when firms (or cities) are embedded in interconnected networks, in which only network members can access shared benefits, known as club goods (Rosenthal & Strange, 2003). These benefits often come with an entry barrier, not all firms or cities are equally included.

- From a **spatial-economic perspective**, agglomeration externalities follow a gravity-based interaction model. In contrast, network externalities resemble an archipelagic pattern: cities or firms remain spatially dispersed and relatively independent, yet they are tightly linked through various spatial flows. The flows are multi-directional to form a polycentric network rather than only radiating from a dominant core (Burger et al., 2014).

- From a **geometrical perspective**, agglomeration externalities are typically abstracted as a "field", emphasizing continuous spatial gradients. Network externalities, on the other hand, begin by nodalizing cities, treating them as discrete nodes, and ignoring geographical distance between them, forming a topological structure. This nodal approach has increasingly become a dominant analytical strategy in regional studies, although it risks overlooking the urban entity itself and many of its spatial specificities (Meeteren et al., 2016).

  The core-secondary spatial relations in Chinese mega-regions are looking for a spatial extension of agglomeration externalities and a broader aspiration for stronger, more efficient network externalities. On one hand, it is hoped that core city infrastructure, markets, and resources can be shared more widely with secondary cities. On the other hand, secondary cities are expected to integrate into the regional network and activate their potential for functional complementarity. However, the club good nature of the mega-regional network brings **entry barriers** for secondary cities. These barriers are often defined by cores, which dominate the regionalization process and retain the power to select their coordination partners. Moreover, the **overly ambitious territorial scale** of Chinese mega-regions not only constrains agglomeration externalities but also hinders the formation of efficient inter-city networks due to excessive distances, especially regarding flows based on physical infrastructure and the mobility or people and resources. Furthermore, **nodalizing cities**, common in mega-regional planning, tends to abstract prefecture-level cities as singular points, since they are often treated as unified administrative actors in planning dialogues. However, at the local scale, each prefecture-level city is not only quite large but also exhibits considerable internal complexity, which is often overlooked by simplified approaches, leaving mega-regional planning with limited operational guidance.

6.3.2 Priority mismatch: the dilemma between competition and cooperation

The overambitious expectations placed on network externalities in Chinese mega-regionalization stem from a broader aspiration for positive inter-city interactions, such as functional complementarity, resource spillovers, and infrastructure sharing. These interactions are often generalized under the concept of "regional cooperation", which remains a leading pathway to unfold the coordination vision. However, although national authorities rhetorically emphasize inter-city cooperation and the need to tackle the unevenness resulted from over-marketization, at the mega-regional level, focusing all resources on a single core is a defensive strategy for retaining overall competitiveness. This, in turn, intensifies inter-city competition. Cores, driven by their own developmental priorities, tend to concentrate high-value resources within their administrative boundaries. Meanwhile, secondary cities are left to compete among themselves for limited spillovers (see Chapter 5).

Competition remains the most representative relation among cities and is arguably a key driver of the unevenness problem. This is widely accepted by local governments as a strategy for maximizing local economic growth. Within this **egoistic** framework, cities operate according to a form of institutionalized self-interest (Patchell, 1996). Cooperation is seen as a voluntary relationship that is only pursued when both parties perceive tangible benefits (Chan & Xian, 2012), such as enhancing local competitiveness (e.g., industrial upgrading, economic progress) or improving political value (e.g., promotion of local officials, or fulfilling targets set by higher-level governments).

This process reflects a fragmented approach emerging from mutual interactions based on shared interests. Since the 1980s, economic reform in China have fostered decentralization of economic development power while assigning cities the responsibility for their own growth (Wei, 2001). This dynamic has been conceptualized as "federalism, Chinese style", in which local governments engage in competition to attract labor and external investment (Montinola et al., 1995). Success in this competition is directly linked to local prosperity and the political advancement of local officials (Lingfan et al., 2025). This triggers a general logic in inter-city relations: when cities share aligned goals or mutual interests, cooperation tends to emerge; but when strategic resources are at stake, competition becomes more pronounced.

This logic has contributed significantly to the Chinese economic boom and has also intensified zero-sum games and widened inter-city disparities. Since the 2000s, mega-regionalization has brought a top-down approach to address these uneven patterns through re-centralized regional governance (Li & Wu, 2012; Wu, 2016). Under this agenda, almost all cities have established formal cooperative ties (Zhang et al., 2021). Cross-jurisdictional projects, namely co-developed high-tech zones, economic development parks, and industrial clusters, have proliferated. Nevertheless, the egoistic approach continues to define the rules of the game, and top-down initiatives have not substantially altered the local incentive structures. This has led to a prevailing mode of "*competitive inter-city cooperation*", in which cities engage in collaboration primarily to advance their own interests (Lingfan et al., 2025). Unsurprisingly, the egoistic mode of cooperation frequently results in core dominance, unequal benefit distribution, and fragmented cross-boundary governance, all of which undermine the broader goals of regional coordination (Chan & Xian, 2012).

However, cooperation is not necessarily the opposite of competition. Patchell (1996) argued that fostering constructive inter-city relations for regional economic growth involves three key actions: **cooperation**, **competition**, and **control**. In contrast, undesirable dynamics include **collusion** (secret, non-transparent cooperation for profit that disregards actual contributions and harms other stakeholders), **conflict** (zero-sum competition akin to a prisoner's dilemma), and **repression** (authoritarian dominance over other partners). Productive competition drives cities to identify and specialize in appropriate market niches, thereby encouraging industrial innovation rather than reinforcing intra-sectoral redundancy. Control, in this context, refers to demand-side regulation over supply-side, which stimulates innovation by fostering a learning-oriented economy to improve the specialized capabilities of suppliers. On this basis, cooperation is ultimately defined as "*the process of mediating control and competition to the mutual satisfaction of both partners* (ibid., 481)".

When reflecting on competitive inter-city cooperation in Chinese mega-regionalization, it becomes evident that the underlying causes of the priority mismatch can be primarily attributed to two interrelated factors.

- First, the potential of competition has not been fully activated as a vital mechanism for fostering functional complementarity and industrial upgrading. Policy discourse tends to focus disproportionately on the adverse consequences of vicious competition. In response, policymakers frequently resort to top-down cooperative approaches to mitigate these issues. However, there remains a lack of promotion of beneficial competition, that is, encouraging cities to identify distinct market niches, pursue functional complementarity, and optimize industrial structures.

- Second, the positive regulatory role of control has not been effectively played. Ideally, control in a regional cooperation framework should function as a feedback mechanism, where demand-side signals guide progress by learning on the supply side. Yet in Chinese mega-regional context, cores seem to use their power in resources, capital, and policymaking for "repression", by dominating the opportunities and agendas of smaller partners. This constrains the cultivation of relation-specific skills and limits the cross-boundary diffusion of knowledge.

In sum, cooperation remains a conceptually ambiguous and practically weak process in mega-regionalization. Under the enduring influence of local egoistic models, a mutually beneficial cooperative order can only be achieved through the effective integration of competition and control.

6.3.3 Actor mismatch: uncoordinated multi-level governance and shared goals

This research critically reflects on actor mismatch across two dimensions. Vertically, it stems from institutional misalignments between top-down visionary planning and local-level implementation. Specifically, secondary cities often fail to benefit from mega-regional plans that envision a greater role for them. Horizontally, actor mismatch is manifested in the uneven power between core and secondary cities. Cores retain the discretion to select preferred partners, while secondary cities are left to compete to gain access to spillovers.

The two dimensions of actor mismatch reflect a misalignment among governance levels and stakeholders that echoes the distinction between Type I and Type II **multi-level governance** outlined by Marks and Hooghe (2010), a framework initially developed to capture the governance dynamics spanning supranational, national, and subnational levels of European integration. It argues that "*governance should operate at multiple territorial levels to capture variations in the reach of policy externalities from global to local levels, thus, only through scale flexibility in governance can such externalities be effectively internalized* (Bache et al., 2016, 488)". This framework has since become a foundational lens for analyzing the complexity of regional governance and has increasingly been applied to the Chinese context of mega-regionalization (Tang et al., 2022; Zhang et al., 2023).

- **Type I governance** tends to reflect federalist traditions, closely embedded in national political structures, characterized by general-purpose jurisdictions with stable, long-term goals, best suited for hierarchical systems with clearly defined institutional roles.

- **Type II governance** aligns more with networked and task-specific governance, featuring flexible, goal-oriented arrangements designed for complex, cross-border or cross-sectoral challenges.

In practice, Type I and Type II are often intertwined, forming a mutually reinforcing and complex system, also in the Chinese context. The vertical and horizontal governance processes examined in this research broadly correspond to the logics of Type I and Type II, respectively. Vertical governance is largely driven by top-down visions and implemented hierarchically through regulatory mechanisms and the redistribution of resources. These visions serve as strategic guidelines that shape and direct the emergence of horizontal governance, namely, the formation of coordinated interactions between core and secondary cities. Importantly, such horizontal cooperation is often not strictly controlled by the vertical structure. As our study emphasizes, mega-regionalization in China is fundamentally a top-down governance framework, however, inter-city cooperation within this structure remains largely market-driven and bottom-up in practice (see Chapter 5).

We argue that whether in vertical or horizontal governance, the establishment and strengthening of inter-city coordination is always a central objective, that can be effectively facilitated through the pursuit of shared goals. These can be unpacked into three primary categories (Capello, 2000), motivating the functioning of multi-level governance:

- First, **efficiency goals**. Many cities engage in cooperation to improve their development and governance efficiency. This includes enhancing inter-governmental communication to support better decision-making or learning from successful policy implementations in peer cities to address local challenges. On the economic front, such learning may involve adopting proven strategies for industrial upgrading or investment attraction. Importantly, this type of cooperation does not always entail joint policymaking or implementation; rather, it emphasizes adaptive learning and the emulation of “best practices” from neighboring cities.

- Second, **synergy goals**, oriented toward integrating cities in a specific socio-economic activity or development vision. They enable agglomeration benefits, such as enhancing port operations through coordinated port-city networks. They also promote functional upgrading and complementarity, for instance by connecting tourism routes or cultural initiatives across cities, thereby encouraging market integration and shared resource use.

— Third, **competence goals**. While similar to efficiency goals, competence goals emphasize co-learning and mutual capacity-building through knowledge transfer and technological collaboration, rather than simply replicating successful models. This reflects a philosophy of "borrowing strengths", wherein cities leverage each other's comparative advantages.

Together, these goals provide a structured lens to understand how inter-city coordination emerges and sustains itself within multi-level governance frameworks. However, aligning actors across scales and interests in pursuit of coordination comes at a cost, that often hinders the realization of these goals (Feiock, 2006). On one hand, such costs arise from the need to dismantle information barriers, promote knowledge exchange, and negotiate the content and approaches of coordination. In our research, the inability of cores to respond to the specific needs of secondary cities exemplifies the limitations of such inter-city communication (see Chapter 5). Moreover, the competition-oriented relations create tensions around resource allocation and benefit sharing. These barriers often lead cities to shy away from collaborative visions, either due to perceived complexity or negotiation failures. On the other hand, collaborative governance also demands time and resources for joint decision-making and implementation oversight. Even when consensus is achieved, developing cross-city policy frameworks or informal cooperation mechanisms is typically a protracted process. The implementation phase brings additional challenges, such as attracting investments and regulatory monitoring.

Based on this, we can finally reflect on the deeper roots of the actor mismatch. First, horizontal governance often lacks a clear consensus on shared objectives, or the goals remain vague and overly homogenized within visionary planning documents without meaningful operationalization. In contrast, successful cases of inter-city collaboration tend to be driven by concrete, task-oriented goals, such as the Beijing-Zhangjiakou partnership, which was propelled by central mandates and anchored in the co-development of winter sports tourism for the Winter Olympics. Meanwhile, vertical governance has yet to effectively lower the transaction costs of building collaborative ties among actors, whether regarding establishing integrated platforms for information sharing or mechanisms for resolving conflicts during policy implementation.

6.4 Policy recommendations

Our findings can finally be translated into practical planning insights and concrete policy recommendations aimed at addressing the three key governance mismatches: place, priority, and actor.

6.4.1 For vertical governance mismatches

Regarding the vertical dimension, both national authorities and mega-regional coordinators should first acknowledge the overambitious scale of current mega-regionalization. While many secondary cities are assigned elevated strategic roles, place mismatches often prevent them from realizing such visions. The same applies to cores, which often lack the capacity to support distant and less connected smaller neighbors. In reality, as our discussion on network externalities has shown, productive urban interaction is not necessarily limited to core-secondary relations, and there exists significant potential among cities of various sizes. As Capello (2000) argued, medium-sized cities can emerge as key engines of regional growth, precisely because of their ability to cultivate horizontal linkages and trigger network externalities. Thus, we recommend a **partial breakdown** of the oversized territorial frameworks of current mega-regional planning through spatial downscaling: encouraging the formation of smaller, intra-regional systems, composed of secondary cities that build cooperative clusters as a whole and gradually form more balanced ties with core cities. In fact, recent mega-regional plans have signaled movements in this direction, for example, in the designation of southern Hebei cities as "functional expansion zones" in the Beijing-Tianjin-Hebei mega-region (DNR Hebei, 2021). However, academic and policy attention remains focused on core-led agglomeration. These emerging sub-mega-regional clusters remain largely underexplored and institutionally unsupported.

Second, concerning priority mismatches, the tendency to prioritize cores in the pursuit of overall regional competitiveness often undermines the political voice and developmental potential of secondary cities. However, we do not argue that such interventions are inherently misguided. On the contrary, they may represent the best choice response by mega-regional coordinators when balancing diverse developmental constraints and political-economic interests. In this sense, competitive inter-city cooperation constitutes an essential contextual feature of the Chinese mega-regionalization process. What requires greater attention is the

potential of “control” as a mechanism to steer market-driven resource allocation toward industrial upgrading and productivity improving. The distinction between control and repression is blurred, which underscores the necessity of institutional design by national authorities and regional coordinators. On one hand, **well-designed control mechanisms** can help build trust between core and secondary cities, which is essential for sustaining cooperative relations. This could include transparent evaluation frameworks or the creation of negotiation and contracting platforms to prevent dominance by core cities leveraging superior political power. On the other hand, such mechanisms should also foster the development and diffusion of **relation-specific skills** in secondary cities, thereby stimulating innovation. This may be facilitated through incentive-based schemes or institutionalized knowledge exchange channels aimed at counteracting low-end industrial lock-in and technological gatekeeping by core cities.

Third, the vertical actor mismatch refers to the failure in translating visionary planning into practice due to the ineffective institutional framework. The incremental adjustment of planning actions has led to a gradual divergence from the original vision of core-secondary coordination (see Chapter 4). We do not advocate for a more powerful institutional actor as the solution. The failures of representative governance bodies in major mega-regions over the past decades, such as the Yangtze River Delta Regional Cooperation Office established in 2003, highlight the limitations of such an approach (Li & Wu, 2012), due to multi-party interest struggles, institutional fragmentation, and the complexity of inter-governmental power relations. Drawing on insights from multi-level governance perspectives, we argue that the main barrier to vertical coordination lies in the conflicts of interest and the cost of coordinating actors. Therefore, rather than enforcing hard institutional controls, what is needed is a more **flexible vertical framework**. At present, top-level actors act mostly as vision initiator in advancing core-secondary coordination, with insufficient mobilizing, monitoring, and evaluation in the governance process. Such functions can likewise be performed through softer roles, serving as mediators and facilitators. This includes collecting mutual needs and expectations, mediating disputes, reconciling conflicting interests, and coordinating the redistribution of resources from a broader regional perspective to minimize the costs for negotiation. In addition, they may play a critical role in mobilizing investment for major inter-city infrastructure initiatives. Through this softer, more strategic form of vertical engagement, the institutional barriers that hinder inter-city coordination, both between core and secondary cities and among peer cities, can be alleviated, unlocking greater collective benefits.

6.4.2 For horizontal governance mismatches

In addressing **horizontal governance mismatches**, our focus shifts to what cities can do to promote regional coordination, especially secondary cities. First, place mismatch refers to the lack of motivation and inner capacity to realize the visions. Of course, we do not expect national authorities to "force" cores to support their smaller neighbors, nor is it feasible to enhance the capacity of all types of secondary cities solely through investment or financial transfers from the top. Such approaches are unsustainable and inadequate to accommodate diverse local challenges. Upon reflection, we find that a key reason for the weak motivation and untapped potential of both parties lies in the underestimation of the complexity of secondary cities as urban regions themselves. In current mega-regional planning, they are often simplified into single nodes, with little attention to internal spatial, administrative, and economic heterogeneity. To address these challenges, we argue that **reinstating the complexity** of secondary cities as urban regions is the first step. Based on this, interactions among urban entities within a certain municipality, not just functional divisions, should be emphasized to enable beneficial intra-city integration. This calls for an internal governance structure within secondary cities to prevent dysfunctional competition or excessive fragmentation, both of which would further undermine their political voice and capacity to participate meaningfully in regional coordination.

Second, the governance mismatch arising from inter-city competition places considerable pressure on secondary cities. For these cities, such competitive system often appears as an entrenched path dependency. In response, differentiated competition and learning-oriented inter-city interaction can serve as effective strategies. On one hand, secondary cities should proactively avoid homogeneous competition by leveraging their **unique comparative advantages**. This principle has already been recognized and promoted in practice; for example, Handan has positioned itself as a regional hub for specialty agriculture, successfully developing a recognizable territorial brand (BNR Handan). On the other hand, the establishment of **learning-oriented inter-city relations** remains underdeveloped and represents a critical direction for secondary cities to pursue. Such mechanisms are essential for breaking zero-sum games and fostering beneficial competition.

Finally, the horizontal actor mismatch stems from the dominant role that core cities play in shaping regional coordination processes, leaving secondary cities, often lacking sufficient political voice, to passively follow the developmental trajectories set by their more powerful neighbors. Yet effective inter-city coordination necessitates the pursuit of shared goals, which we argue provides a critical entry point for challenging core-city dominance. While the visionary planning may seem to outline these shared goals, as previously discussed, they are often overly generalized

and abstract, offering limited practical guidance. In this way, we propose that secondary cities should actively engage in dialogues and formal communication with cores within the broader framework of regional coordination. Through such interactions, cities can jointly define concrete and actionable goals across the dimensions of efficiency, synergy, and competence. Crucially, the formulation of these **shared goals** should also incorporate the specific needs and development agendas of secondary cities. In doing so, these goals function not only as a framework for cooperation but also as an agreement for maintaining the political voice of secondary cities. Also, by contributing to these shared objectives, secondary cities can further mobilize their development potential and reinforce mutually beneficial coordination with core cities. The policy recommendation we propose in response to the vertical actor mismatch can also support this. The establishment of a more flexible institutional framework can also empower secondary cities to pursue shared goal setting with core cities, that actively engages national authorities and mega-regional coordinators to facilitate communication, mediate conflicts, and reduce transaction costs.

6.5 Conclusion

The primary contribution of this research lies in constructing and embracing a secondary city perspective to critically reflect on the coordination vision of Chinese mega-regionalization. While growing academic and policy attention has been given to inter-city disparities, it is only through the lens of secondary cities that we can fully uncover their struggles, constraints, and untapped opportunities within complex regional systems. Secondary cities represent an emerging gateway for advancing mega-regional coordination. On one hand, they are often the weaker links of economic competitiveness; on the other hand, they possess substantial potential to contribute to high quality regional development. Accordingly, our understanding of secondary cities is rooted in spatial relationality within mega-regional systems, making the spatial relations between core and secondary cities the fundamental analytical lens of this research.

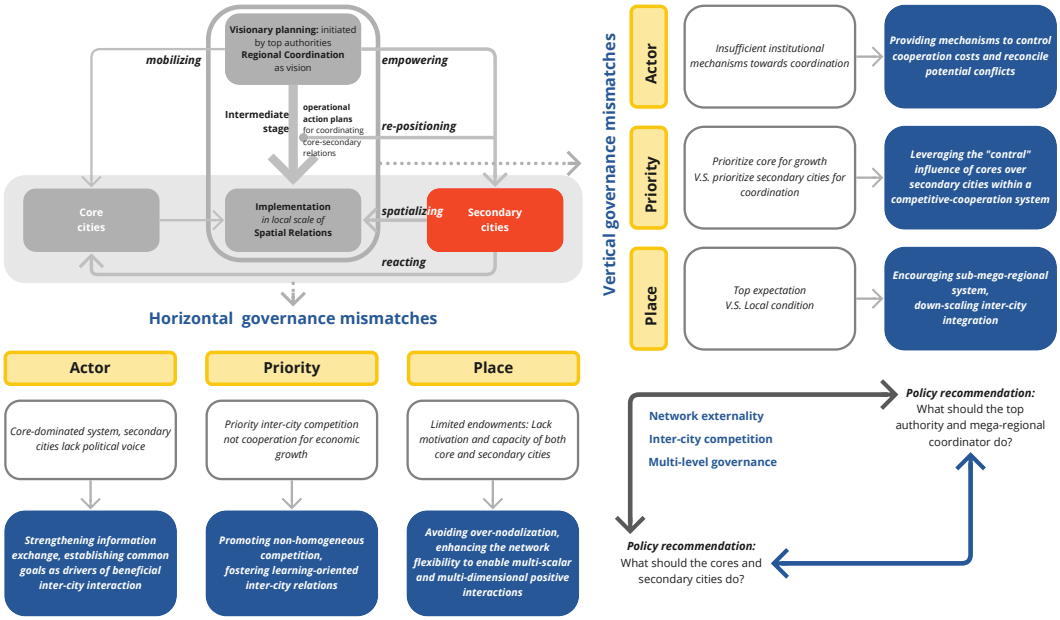

FIG. 6.2 Final conceptual framework: governance mismatches and policy recommendations

Our exploration begins with an empirical assessment of secondary cities, focusing on their developmental disparities in relation to corresponding core cities. We employ a typological classification to identify three categories representing problematic spatial relations, laying the foundation for subsequent in-depth case studies. Simultaneously, we analyze national-level planning documents issued to uncover the underlying visions of mega-regional coordination, to understand how secondary cities are positioned to benefit within these visions. This allows us to carefully reconceptualize Chinese mega-regionalization as a re-centralizing, top-down initiative, driven by spatial planning and aimed at coordinating spatial relations between core and secondary cities to address the challenge of uneven development. Our analysis deconstructs this vision into three policy orientations articulated by national authorities: coexistence, connectivity, and cooperation. We argue it is precisely through this emphasis on the “three COs” that secondary cities may be assigned more crucial roles, enabling them to integrate into, benefit from, and contribute to the broader vision of mega-regional collaboration.

However, secondary cities continue to face the dual challenges of polarization and peripheralization. This research unpacks the governance trajectory of mega-regionalization along two dimensions: vertically, from the top-down initiation of visionary planning by national authorities, to the intermediate stage where mega-

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regional coordinators interpret and translate such visions into concrete action plans, and finally to the implementation of these plans at the city level; horizontally, through the dynamics of negotiation between core and secondary cities during the implementation stage and the strategies adopted by secondary cities in response. This multi-scalar exploration leads to our central contribution: explaining why secondary cities often fail to benefit from the mega-regionalization. We identify three types of governance mismatches that hinder both vertical and horizontal trajectories of coordination. Place mismatches arise vertically from the misalignment between top-down expectations and local conditions, and horizontally from secondary cities' motivation and internal capacity to engage in collaboration. Priority mismatches reflect the vertical prioritization of core city development over regional coordination, and a horizontal tendency among cities to compete rather than cooperate. Actor mismatches stem vertically from institutional inefficiencies, and horizontally from the political dominance of core cities. These mismatches reveal both conceptual and practical constraints faced by secondary cities. To address this, we engage with foundational theories of regional development and governance including network externalities, inter-city cooperation, and multi-level governance, and offer targeted policy recommendations for various stakeholders across both vertical and horizontal dimensions.

This research lays the foundation for further academic research and calls for greater scholarly attention to be directed toward secondary cities, smaller yet increasingly pivotal actors in regional development. It offers a lens through which to examine the constraints, values, and potential of these smaller players in regional systems. Most importantly, this framework serves as an analytical tool for investigating governance challenges faced by secondary cities elsewhere in mega-regionalization processes, contributing to more comprehensive and diversified case-based research that advances the realization of inclusive regional coordination visions.

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In recent years, tourism has been widely promoted as a pathway for "self-rescue" in secondary cities. This shift often represents a transition away from traditional, high-pollution resource-based industries or labor-intensive manufacturing toward higher-end service sectors. Drawing on its rich historical and cultural assets, Handan has regenerated historic districts into commercial and leisure pedestrian streets, creating another cultural and commercial brand for the city.

The regenerated historic districts in Handan, photographed by Kaixuan Wen.

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Reflection and future perspectives

The most prominent contribution of this research lies in framing the concept of secondary cities relationally in Chinese mega-regionalization, and identifying the governance mismatches, that explain why mega-regional visions have not been effectively realized to the benefit of secondary cities, nor alleviated intra-regional unevenness. The novel conceptualization of governance mismatches not only deepens our understanding of the current characteristics of Chinese mega-regionalization and the practical obstacles it poses for secondary cities, but also develops an analytical tool for future investigations into the diverse developmental trajectories of secondary cities. This, in turn, enables further exploration of how to better integrate these smaller players into mega-regionalization processes and ensure they benefit from them, contributing to a more balanced path of regional development.

We have sought to explore the opportunities and challenges faced by secondary cities through two complementary lenses, horizontal and vertical. However, the limited scope and timeframe of the doctoral program have, to some extent, constrained the potential for a broader vision. On one hand, our investigation has been situated in the Chinese context, and we have naturally committed to examining it from within this setting by tracing the process from planning visions to implementation actions, from conceptual frameworks to practical applications. Although each chapter attempts to situate our findings within wider global academic debates and identify similarities and differences with comparable secondary city cases in the West, our work inevitably remains heavily anchored in the Chinese context, and therefore is not directly applicable to other political-geographical settings. On the other hand, we conceptualize mega-regionalization as a top-down governance process initiated by the authorities, with a vision of fostering coordinated spatial relations between core and secondary cities. Yet in our research, “the top” refers to national state authorities, and the analysis ultimately lands at the scale of the “individual city”. This is evidently not a fully “bottom” perspective. Take Handan, the representative secondary city examined in this study: it is an urban region with a population of around 10 million, including an urban core of about 2 million residents, dozens of large towns with populations ranging from tens of thousands to several

hundred thousand, and countless rural settlements. In almost any other political-geographical context, it would be striking if such a complex entity were abstracted as a mere “secondary city”. Clearly, the “down-warding” of this top-down perspective still offers vast room for further exploration.

Another limitation, beyond the constraints of scope, lies in the over-simplification of the diversity and complexity of secondary cities within the mega-regional system. Although we have made every effort to account for heterogeneity among secondary cities by using a typological approach to profile different cities and highlight their variations, we must acknowledge that abstracting all secondary cities in China into five types and selecting only one “representative” for in-depth study inevitably introduces certain bias. Our choice to adopt core-secondary spatial relations as the analytical lens partially offsets this bias: while cities differ, certain representative spatial relations can be abstracted to reflect on the underlying causes of unevenness and explore potential pathways for response. This lens also becomes a valuable tool for investigating a wider range of secondary city cases to better understand their diversity and complexity. Furthermore, field-based qualitative research has provided this study with more direct and nuanced insights into the operationalization of planning and governance actions. It has bridged the gap between vision and practice, while also revealing how such pathways function and their tangible impacts for secondary cities. However, this case-centered approach, on its own, is insufficient for systematically deriving generalizable causal mechanisms, that is, for determining the extent to which different mega-regionalization pathways produce particular impacts on secondary cities. In essence, such mechanism-oriented inquiry is methodological thinking for further delineating the diversity and complexity of secondary cities, allowing the identification of key causal chains under varying developmental contexts.

Building on this, we identify four promising directions for future research to further reflect on the role and potential of secondary cities within mega-regional systems towards coordinated regional development:

Future perspective 1: Beyond the Chinese context towards international comparison

We have presented parts of this doctoral research at several international academic conferences. Professor Claire Colomb from the University of Cambridge offered an important remark (9 May 2025): "*If I close my eyes and forget that this research is based in the Chinese context, I would think that the three governance mismatches you identify, place, priority, and actor, could just as perfectly explain the challenges of uneven regional development in Europe. When we keep emphasizing how different the Chinese and European contexts are, why do we end up with almost the same answer?*" While we are not yet in a position to answer this question, it undoubtedly points to a promising direction for further investigation. In the face of mega-regionalization as a widely observed global trend, to what extent are the Chinese and Western contexts, and, indeed, those of the broader Global South, including Africa and Latin America, similar or different, particularly in terms of the role, potential, and challenges of secondary cities? Addressing this question would not only further consolidate and enrich the governance mismatch framework proposed in this research, but, more importantly, also call for collaborative projects, knowledge exchange, and joint actions among urban actors across diverse political-geographical contexts worldwide.

Future perspective 2: Beyond top-down regional governance towards local complexity

We have repeatedly emphasized that, when focusing on the spatial relations between core and secondary cities, there is a tendency to over-simplify inherently complex secondary cities into a single "node". For example, when discussing the "main functional positioning" of a city, an urban region with a population of 10 million (Handan) has to meet a wide range of needs for its people; any overly simplified or vaguely defined positioning as a functionally specialized secondary city can only remain on paper and cannot be realized in practice. In our discussion with Dr. David Kaufmann from ETH Zurich (2 April 2025), he noted that this in fact relates to the "basic" functions all secondary cities should possess, and, building on this foundation, the opportunities they should leverage in mega-regionalization to extend certain functions in ways that foster closer relations of coexistence, connectivity, and cooperation with other cities. Therefore, we argue that, beyond the prevailing top-down paradigm of regional governance, future research should place greater emphasis on the complexity of secondary cities as urban regions in China. This includes identifying development goals that both provide a high quality of life for local residents and enable these cities to leverage their advantages in

mega-regionalization; examining the multi-dimensional relationships, divisions of labor, cooperation, or competition among intra-urban entities, and the pathways that promote their coordination and integration; and analyzing the interactions between the complexities of both intra-urban and inter-urban dimensions. Such an approach would enable a deeper understanding of how mega-regionalization as a highly macro-level regional development policy, affects these more localized sectors and actors.

Future perspective 3: Beyond single case study towards comprehensive exploration

At the early stage of this doctoral research, Dr. Evert Meijers from Utrecht University, cautioned that placing excessive focus on a single case could introduce potential bias, and that the typological approach was intended to facilitate comparative case analysis, this points has also been highlighted by the supervision team (13 February 2023). In the subsequent research, we followed this advice by selecting three different types of cases at the mega-regional level for investigation. At the individual city level, Handan was justified as the most representative case, as it is linked to multiple types of core-secondary spatial relations across several dimensions. This choice enabled us to conduct an in-depth exploration aimed at addressing the research questions, supported by close relationships built with local government officials and the collection of valuable interview and fieldwork data. Nevertheless, broader comparative case studies at the city level should be given greater attention in future research, to better explain heterogeneity among secondary cities and to generate more specific and targeted policy recommendations for optimizing mega-regionalization.

Future perspective 4: Beyond conceptualization towards mechanism identification

This doctoral research is grounded in conceptualization as its primary exploratory approach, underpinned by qualitative research, with fieldwork as a key component. In a discussion with Professor Bingdong Sun from Zhejiang University (12 August 2024), the value of this conceptualization-oriented approach was recognized. Its value lies not only in providing an interpretation of Chinese mega-regionalization processes from the perspective of secondary cities, but also in offering a promising potential research agenda for employing econometric causal inference to gain deeper insights into how the multi-dimensional pathways of mega-regionalization affect secondary cities and core-secondary spatial relations. Such

inquiry will require broader data support, therefore, integrating spatial-temporal big data analytics to produce more precise profiles of secondary cities also constitutes an important future research direction.

In sum, this doctoral research lays a solid foundation for future investigations from multiple perspectives. This is enabled by our inquiry being shaped within the composite contexts, perspectives, and emphases of four countries (China, the Netherlands, Switzerland, and the United Kingdom) and four different disciplines across four institutions (Department of Urbanism in Delft, Department of Human Geography in Utrecht, Department of Civil, Environmental and Geomatic Engineering in Zurich, and Department of Land Economy in Cambridge). This interdisciplinary positioning has enabled us to examine secondary cities in Chinese mega-regions through the lenses of governance, geography, urban studies, and public policy. Nevertheless, we want to underscore that this interdisciplinary doctoral thesis remains firmly rooted in the discipline of **planning**, as it emphasizes both the vision and the pathways to its realization. In this light, research on regional planning for secondary cities is, in fact, only just beginning. We believe that there remains one fundamental future perspective that warrants deeper exploration, and we present it here as the final statement of the entire doctoral study:

Future perspective 5: Beyond problem understanding towards efficient planning strategies

Our research has revealed why promising visionary planning for mega-regional coordination has failed to effectively alleviate the unevenness between core and secondary cities, and, on this basis, has provided policy recommendations. However, concrete planning, covering emerging strategies and interventions, pathways for spatial action implementation, solutions for technical challenges, and stakeholder engagements, still requires further discussion, design, simulation, evaluation, and optimization.

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Curriculum Vitae

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Du Yizhao is a PhD candidate in the Section of Spatial Planning and Strategy, Department of Urbanism, Faculty of Architecture and the Built Environment, Delft University of Technology, and a Visiting Scholar at Department of Land Economy, University of Cambridge; Downing college, University of Cambridge; and Spatial Development and Urban Policy, ETH Zurich. His primary research focuses on spatial planning, governance, and regional coordination, specializing in the analysis of multidimensional spatial relations between cities, with particular emphasis on secondary cities and their roles within mega-regional systems. His research is fully funded by the Sino-Dutch Bilateral Exchange Scholarship Program.

Prior to his doctoral studies, he earned a Master's in Architecture, Urbanism and Building Science (Cum Laude, 2021) from TU Delft. Trained as an urban designer and planner, his work centered on urban sustainability and transformation. He examined how cities pursue sustainable transitions, including economic vitality, environmental performance, and social equity, and reflecting on how planning tools and governance practices shape the distribution of benefits, equity, and the long-term viability of sustainable urban development.

His scholarship also extends to urban and regional sustainability in the Global South, with particular attention to Africa. Since 2023, he has been an AMBITION Scholar under AMBassadors for sustaInable transITION, a Joint Honors Programme for PhD researchers funded by the European Union's Erasmus+ initiative as the first IDEA LEAGUE joint EU-AU project. He has participated in training and discussion on sustainable development in Africa, emphasizing on climate-related challenges and spatial (in)justice, contributing insights from a spatial planning perspective. This experience has further expanded his international academic engagement: during his doctoral studies, his scholarly exchanges have spanned over a dozen countries and regions across Asia, Europe, Africa, and America.

Key Publications

- **Du, Y*.** Multidimensional disparities in urban liveability across Chinese non-core cities: a typological exploration based on carbon emissions differences. *Humanities and Social Sciences Communications* (Q1, IF=3.7). https://doi.org/10.1057/s41599-025-06380-9

- **Du, Y.**, Cheng, Y., & Sun, B*. *(accepted)*. Emerging pathways of mega-regional coordination among large, medium, and small cities towards new quality productive forces: The critical roles and practical obstacles of secondary cities. *Geographical Research*. In Chinese.

- **Du, Y*.**, Cardoso, R. V., & Rocco, R. (2025). Navigating intra-regional unevenness in China: engaging secondary cities towards coordinated mega-regionalization. *Habitat International* (Q1, IF=7.0), *166,* 103619. https://doi.org/10.1016/j.habitatint.2025.103619

- **Du, Y*.**, Cardoso, R., & Rocco, R. (2024). Towards Coordination of Spatial Relations: Understanding Chinese Mega-Regionalization from a Secondary City Perspective. *Cities* (Q1, IF=6.6), *154,* 105375. https://doi.org/10.1016/j.cities.2024.105375

- **Du, Y*.**, Cardoso, R. V., & Rocco, R. (2024). The challenges of high-quality development in Chinese secondary cities: A typological exploration. *Sustainable Cities and Society* (Q1, IF=12.0), *103,* 105266. https://doi.org/10.1016/j.scs.2024.105266

- Zhang, J., Jiang, N*., **Du, Y.**, & Chung, T. (2025). Unlocking multiple potentials: a data-driven framework for adaptive reuse of industrial heritage in Changzhou, China. *Journal of Asian Architecture and Building Engineering* (Q3, IF=1.6), 1–23. https://doi.org/10.1080/13467581.2025.2587250

- **Du, Y*.** (2021). Transformation and revival: Research on urban development strategic planning for HanDan under the dual dilemma of resource-based industry transition and regional spatial marginalization. https://repository.tudelft.nl/islandora/object/uuid%3A3f183391-5bfb-4155-9733-89a7a77c5897

- Zhen, M., **Du, Y.**, Hong, F., & Bian, G*. (2019). Simulation analysis of natural lighting of residential buildings in Xi'an, China. *Science of The Total Environment* (Q1, IF=8.2), *690,* 197–208. https://doi.org/10.1016/j.scitotenv.2019.06.353

Publications under review and working paper

- **Du, Y*.**, Cardoso, R. V., & Rocco, R. *(revised & resubmitted)*. Blind spots of state spatial selectivity: the left behind secondary cities in Chinese mega-regionalization. *Urban Studies*.

- **Du, Y.***, Cardoso, R. V., & Rocco, R. *(under review)*. Passiveness in state entrepreneurialism: How secondary cities survive mega-regionalization. *Political geography*.

- **Du, Y.**, & Sun, B*. *(under review)*. Insights from the Dutch Polycentric Metropolitan System for China's Metropolitan Development. *Urban problems*. In Chinese.

- Zhang, C., & **Du, Y*.** *(under review)*. Revitalizing collective memory in historic community regeneration: a designer-led perspective. Habitat international.

Selected academic activities

Teaching

- Member in supervision team of graduation studio, Planning complex cities, Urbanism, Delft University of Technology (2022/ 2023/ 2024/ 2025)
- Supervisor of Urban Regeneration and Regional Transformation, master course PGR07, Land Economy, University of Cambridge (2025)
- Lecturer of Planning history and Theory, master course AR1U121, Urbanism, Delft University of Technology (2024)
- On-site mentor for Social Practice and Learning Program at Tsinghua University (2024)

Invited reviewers for journals in urban planning and governance field

NPJ Urban Sustainability | Habitat International | Regional Studies | Sustainable Cities and Society | Humanities and Social Sciences Communications | Applied Spatial Analysis and Policy | Scientific Reports | Area Development and Policy

Conferences

- **Annual Conference Cambridge Journal of Regions, Economy and Society: Cambridge, UK**
  - Theme of conference: The Climate Crisis: making cities resilient
  - Awarded with Conference Scholarship (07/2025)

- **The 2025 International Conference on China Urban Development: London, UK**
  - Presentation entitled surviving mega-regionalization: spatialization pathways and practical obstacles of Chinese secondary cities towards regional integration
  - Funded by Urbanism, Delft University of Technology (07/2025)

- **The 63rd Congress of Regional Science in Europe: Terceira, Portugal**
  - Organizing the special session entitled From Neglect to Nuance: Exploring the Diversity of Second-Tier Cities.
  - Presentation entitled Chinese secondary cities as the pathfinder towards mega-regional economic upgrading.
  - Funded by Urbanism, Delft University of Technology (08/2024)

- **Congress Association of European Schools of Planning 2023: Łódź, Poland**
  - Presentation entitled Navigating mega-regionalization, a conceptual framework to understand the conflicts faced by regional secondary cities in China.
  - Funded by Urbanism, Delft University of Technology (07/2023)

- **Congress Association of European Schools of Planning 2022: Tartu, Estonia**
  - Presentation entitled Spatial planning as a regional governance tool: towards a cooperative framework for secondary cities in China.
  - Funded by Urbanism, Delft University of Technology (06/2022)

Academic activities & awards

- Most Impactful Award & Second Prize, UNESCO Youth Climate Action Innovation Competition (2025)
- Convener of the International Association for China Planning (IACP), European chapter (2024-2025)
- AMBassadors for sustaInable transITION: EU & Africa (2023-2025)
- National Pioneer Cup Digital Twin Innovation and Application Competition in China, Young Talent Award, 2023

- Chair of the Youth Club World Urban Planning Education Network (WUPEN): Shanghai, China (2021-2023)
- Aijing award for urban planning and design in China (2021)
- Outstanding Student Leader in Hebei Province, China (2019)
- Scholarship for National Outstanding University Student (ziqiangzhixing) of China (2018)

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26#03

Navigating mega-regionalization

Engaging Chinese secondary cities towards the coordination of spatial relations

Yizhao Du

Secondary cities are gaining increased attention in regionalism debates, reflecting both a critique of the excessive reliance on dominant core cities and a growing recognition of the multidimensional potential of smaller cities in polycentric regional systems. This concern is particularly evident in Chinese mega-regionalization, which promotes coordinated spatial relations between core cities and surrounding smaller cities as a key strategy to address intra-regional unevenness. However, despite more than two decades of implementation as a national spatial strategy, mega-regionalization has not substantially alleviated the challenges faced by secondary cities. These cities continue to experience polarization, as development factors concentrate in core cities, and peripheralization, as cores retain political centrality. Against this background, this research aims to find out how the coordination of core-secondary spatial relations can help secondary cities navigate mega-regionalization challenges. Two main findings are identified. First, mega-regionalization relies heavily on state-initiated spatial planning orientations to coordinate core-secondary spatial relations, structured around coexistence, connectivity, and cooperation. This framework is intended to integrate secondary cities into a more balanced regional system. In practice, however, this ambition has not been fully realized. Second, the gap between vision and outcome can be explained by governance mismatches across three dimensions: place, referring to insufficient endogenous capacities and willingness across localities; priority, reflecting divergent visions and value hierarchies among stakeholders; and actor, referring to institutional power asymmetries. These mismatches constrain both vertical coordination from top visions to local implementation and horizontal coordination between core and secondary cities. Theoretically, this study extends discussions of secondary cities in regionalism to the mega-regional scale and advances governance mismatches as a lens to understand coordination barriers from the perspective of secondary cities. Practically, it underscores the role of spatial planning as a key instrument for regional coordination and offers insights for improving planning policies and implementation pathways.

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