



World cities under conditions of digitization and platform capitalism: Updating the advanced producer services complex

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ABSTRACT

This themed issue showcases contributions that study how processes of digitization and platformization are reshaping the intermediary role and operations of advanced producer services (APS). It places these alterations against the backdrop of earlier rounds of APS 'shapeshifting' amid globalization and financialization. This introduction to the themed issue outlines the main dimensions of these shifts affecting APS: geographical changes, sectoral and functional changes, organizational changes, and strategic-institutional changes. Reflecting on the themed issue contributions, we posit that digitization and platformization are rapidly altering APS as organizations, but there is little evidence for a wholesale loss of their intermediary function. In geographical terms, we observe that the platformization of APS is generating networked dependence of world cities on tech centres, further entangling APS intermediation with wider geopolitical concerns about technological sovereignty.

1. Update needed...

This themed issue¹ examines how digitization and platform technologies are reshaping processes and spatialities of capitalist intermediation. Digitization entails the deployment of digital technologies in the organization and operations of firms. The more specific process of platformization is grounded in digitization but additionally captures how platform logics and technologies enable firms and other organizations to become more data-centred in their operations and when they develop new core competencies. Platformization, in other words, points to the growing importance of collecting, analyzing, and valorizing data in business models. We particularly focus on the advanced producer services (APS) complex² that is clustered in and networked across world- and global cities, or, more narrowly defined, financial centres. The APS complex is comprised of financial institutions and the wider 'para-

financial' cluster of firms in accounting, law, management consultancy, and advertising. This complex has long been theorized as a set of crucial intermediaries in the production and (spatial) coordination of corporate activities and markets, as well as the orchestration of global production and financial networks (Bassens et al., 2021; Coe et al., 2014; Sassen, 2018; Wójcik, 2013).

For a long time, APS firms have been conceptualized as crucial knowledge intermediaries in reproducing contemporary capitalism. This themed issue starts from the observation that, like many other sectors in the global economy, these traditionally knowledge-intensive services are undergoing rapid transformation. Crucially, if digitization and platformization are reshaping what the APS complex does, how knowledge is gathered and what it comprises, then the orchestration of the whole world economy could also be transformed. To assess that fundamental question, we brought together contributions that trace the

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¹ Papers in this themed issue are drawn from contributions to an online workshop on "Evolving Geographies of FinTech" organised by the Global Network of Financial Geography (FinGeo) on 25–26 November 2020.

² One could argue that terms like 'Advanced Business Services' (ABS), or 'Financial and Business Services' (FABS) are better contemporary substitutes for 'Advanced Producer Services' (see Wójcik, 2020a for a comparison of these terms). Indeed, some contributors to this themed issue prefer one of these alternatives. That said, we decided to use APS in this introduction in recognition of the important linkages with 'production' in exploring intersections with non-financial actors and processes, especially in terms of the totality of the various APS sectors as a 'complex'. The term 'complex' denotes a set of localized, interacting industries that function as more than the sum of its parts in shaping wider production and financial networks (see Bassens et al. 2021; Trincado-Munoz et al., 2024).

growing digitization of APS firms and their embrace of platformization, while reflecting on the wider geographical implications of these transformations.

The themed issue title acknowledges the relevance of a long-standing research tradition on world and global cities, which has increasingly been blending with research of financial centres and their insertion in global financial networks, especially after the 2008 global financial crisis (Van Meeteren and Bassens, 2024). The title is a playful reiteration of Peter Taylor's (2000) influential paper titled 'World cities and territorial states under conditions of contemporary globalization' that sought to account for globalization as the defining process shaping the world economy of the 1990s. The title also refers to a more recent piece retheorizing the APS complex under conditions of *financialized* globalization (Bassens and Van Meeteren, 2015). In this sense, the current collection of papers represents emerging insights into how the hierarchical APS complex is 'shapeshifting' under contemporary conditions of digitization and platformization, with implications for how we understand processes of APS *intermediation* that traditionally take place in world- and global cities.

2. The shapeshifting nature of APS

Research on APS spans more than half a century, and has periodically captured the sector's changing nature. It was Gottmann (1961; 1970) who synthesized that business services occupations played an increasingly pivotal role in the orchestration of the world economy from the mid-twentieth century onwards. During the 1980s, these service functions morphed into a class of multinational corporations (and partnerships) in their own right, servicing industrial corporations and guiding the globalization of economic activity (Moulaert et al., 1995; Sassen, 2001 [1991]). The localized and networked economic effects of these orchestration functions gave rise to the world city and global city literatures (Friedmann and Wolff, 1982; Sassen, 2001 [1991]; Taylor and Derudder, 2016). Not only do APS firms and sectors indicate a division of labour in the orchestration of global circuits of value, but their very presence has been theorized as indicative of emerging social transformations (Rossi et al., 2007). Gottmann (1970) made a highly influential case that APS functions should be regarded as more than a single industry or profession, coining the term 'quarternary sector' to emphasize the specific importance of knowledge and innovation in corporate (re)organization, distinguishing APS from the broader 'tertiary sector' of services. The 'complex' in the APS complex indicates that the orchestration of the world economy in general, and of multinational corporations in particular, is not the property of a single firm, or a single class of firms, but that it requires coordination across a variety of APS professions or sectors (Bassens et al., 2021); Trincado-Munoz et al., 2024), often predicated on co-location in dense metropolitan areas and networks (Sassen, 1991 [2001]; 2018).

The organization of economic activities is never a static affair and has always been strongly modulated by social, economic, and technological developments. In the 1980s and 1990s, the competitive advantage of APS firms was attributed to their ability to provide 'seamless services' to globalizing multinationals (Faulconbridge et al., 2012), as these multinationals expanded or relocated manufacturing operations to lower cost locations in developing economies—hence the emphasis on 'production' in advanced *producer* services. APS intermediation was to seamlessly bring together financial, technological, institutional, legal, and organizational expertise to afford corporations maximum flexibility when operating across the globe (Daniels and Moulaert, 1992). As financialization started to (re)shape their operations during the 2000s, APS intermediation shifted towards the *financial* rather than the *organizational* optimization of the firm (Bassens and Van Meeteren, 2015; Wójcik, 2013). Resultantly, the 'para-financial' APS complex has since been conceptualized as an 'obligatory passage point' for financialized corporations (Bassens et al., 2021; Bassens and Van Meeteren, 2015; Coe et al., 2014).

This brief history shows the importance of APS work and its key sites and actors for the ongoing transformation of global capitalism, but also how the APS complex itself is dynamic, and periodically shapeshifts in its intermediation role. With financialized capitalism giving way to—and enmeshing with—platform infrastructures and logics, we posit that contemporary understandings of the APS complex should undergo another update. Lai (2020), for example, discusses how financial technology (FinTech) can be understood as the expression of a new round of dis/re-intermediation process, as new types of firms (e.g., tech giants and start-ups) and technologies (e.g., data analytics, artificial intelligence (AI)) are assuming/reshaping intermediary roles long performed by the financial services industry at the heart of the APS complex (Pažitka et al., 2022). There is also evidence of a wider digital transformation of knowledge-intensive services (Van Meeteren et al., 2022), whereby 'Big Tech' corporations are assuming a mounting infrastructural role (Hendrikse et al., 2022). As tech companies become increasingly important across economies and societies, and with the emergence of what is now termed 'platform capitalism' (Srnicsek, 2016; Langley and Leyshon, 2021) in the aftermath of the 2008 global financial crisis, the intermediary role of the APS complex is rapidly changing, once more, suggesting that academic understandings require an update.

Although information and communication technologies (ICT) were prominent in early research on the rise of the service economy (Moulaert and Djellal, 1995), they were often omitted from global and world cities research due to pragmatic methodological choices. To build a stable longitudinal dataset of global services firms in the 1990s, large firms were selected at the expense of specialized small ICT start-ups. This was methodologically justifiable because ICT start-ups during this period were increasingly consolidated as part of the large 'management consultancy' firms that were included in the world city data collection. A side effect of this pragmatic choice is that the evolving importance of ICT becomes difficult to trace in the world city network (Trincado-Munoz et al., 2024, cf. Taylor et al., 2011). A reconceptualization of APS intermediation is particularly important now as digital technologies and platform business models are increasingly reshaping 'traditional' and financialized forms of intermediation that we attribute to APS firms more broadly.

A key development is the rise of large technology firms, i.e. Big Tech, with moorings in the United States (GAFAM) and China (BAT) that form the 'infrastructural core' of platform capitalism (Van Dijck et al., 2018).³ These platform actors mediate increasing domains of economy and society and extract value or rent through the management, control, and reconfiguration of data (Birch and Cochrane, 2022; Hendrikse et al., 2022; Rikap, 2022). As these platform technologies and data-driven businesses enter the realm of financial services, the resulting FinTech applications trigger a dis/re-intermediation of finance and change conceptualizations of who should be considered 'financial' and APS actors (Haberly et al., 2019; Lai, 2020; Lai and Samers, 2020). There is also growing adoption of platform models operating via apps and clouds by the finance industry itself, giving way to platform finance (Hendrikse et al., 2018; 2019). In addition, technologies such as AI, machine learning, and blockchains are starting to influence the organization and practices of APS functions more widely, transforming the (localized) work practices of, for instance, legal firms (LegalTech), accountancy (AccounTech, RegTech), and how business intelligence operates. The result could be a reconfiguration, if not a reboot, of the hierarchical power relations within the APS complex itself.

While the economic and urban geographies of the APS complex have been remarkably stable over the past twenty-five years of world city network analysis, there are emerging trends around changing

³ GAFAM is an acronym for the American tech giants: Google (now Alphabet), Amazon, Facebook (now Meta), Apple, and Microsoft, while their Chinese counterparts are often labelled as BAT: Baidu, Alibaba and Tencent. For more on Big Tech, see Fernandez et al. (2020).

globalization dynamics with shifting gravities of economic activities (Derudder and Taylor, 2020). In the context of new platform capitalist intermediation and changing APS complex, the phenomenal growth of Chinese Big Tech firms could also signal a geographical reconfiguration of financial networks and economic landscapes (Lai et al., 2020; Wójcik, 2020b; Hall, 2023). This raises a question of whether such technological shifts, augmented by the outbreak and management of COVID-19, might accompany a wider global shift toward the Asia-Pacific region, altering the power relations between macro-regional blocks in the global economy. With the United States and its allies seeking to counter the digital rise of China by means of mounting export restrictions to prevent access to key inputs like advanced chip machinery and semiconductors, financial intermediation has increasingly become a geopolitical affair (Bassens and Hendrikse, 2022; Petry, 2024).

3. The contributions

In identifying some of these transformative trends, the papers in this themed issue seek to answer the following four interrelated questions:

- What are recent *geographical changes* in the APS sectors? How and to what extent are processes of APS reintermediation giving rise to altered networked hierarchies between international financial centres? To what extent are digitization and platformization driving new dependencies of established financial centres on BigTech infrastructures (Van Dijck et al., 2018), and to what extent are tech centres becoming more salient nodes in global financial networks?
- What *sectoral and functional changes* are occurring in APS? How is the APS complex undergoing restructuring in terms of collaboration, competition, and the entrance of new corporate players such as FinTech start-ups and Big Tech players? Does the idea of a *para-financial complex* (Bassens et al., 2021) still hold, or is the balance of power shifting toward tech firms?
- What are the *organizational changes* affecting APS? How are digital technologies and platform logics transforming business practices and the (spatial) organization of APS firms themselves, and with respect to users and investors? Put differently, how is the act of APS intermediation qualitatively shifting amid digitization and platformization (Lai, 2020)?
- What are the *strategic-institutional changes* impacting APS geographies? How are potentially altered networked hierarchies and power relations within the APS complex institutionally mediated? In what way do we see novel forms of strategic coupling between the interests of Finance, Technology and the State in and across various contexts (Hendrikse et al., 2019; Jain and Gabor, 2020)?

Broadly focusing on the four questions above, the collection of papers in this themed issue offers ways to reconceptualize the shifting roles, structures, and power of the APS complex under digitization and platform capitalism. The papers examine the ways in which these shifts are reconfiguring the roles and positions of international financial centres as obligatory passage points and orchestrating centres of the global economy. The analysis typically focus on a particular scale – the financial centre, APS sectors and functions, the firm or the organization, with reflections on how their geographical political economic embeddedness matter as woven into their contributions.

Commencing with financial centre changes, Hendrikse et al. (2024) focus on Amsterdam, The Netherlands. They study how and to what extent financial platformization entails the ‘rebooting’ of the Amsterdam financial centre, investigating the changing composition and spatial structure of its APS inhabitants; the platformization of incumbent financial institutions and the rise of new tech intermediaries, and deepening interdependencies between financial institutions and Big Tech. Their findings show that platform companies have come to inhabit the city at the expense of incumbent finance and other APS. Besides the growing footprint of resident platform companies, typically relying on

Big Tech cloud services, they identify growing interdependencies between finance and tech, as exemplified in the growing-yet-uneven adoption of cloud services among financial institutions. In the payments domain, moreover, new FinTech intermediaries assume functions at the expense of ‘legacy’ APS intermediaries, including incumbent banks. They conclude that the post-2008 rise of platform capitalism is giving way to financial reintermediation and changes within financial centres, with tech companies forming an increasingly dominant sector within a platformizing *para-financial* APS complex, with Big Tech assuming a growing infrastructural role.

Moving from a long-standing yet restructuring financial centre like Amsterdam to rising India, the paper by Migozzi et al. (2024) focuses on the development of Indian Fintech ecosystems, thereby deploying a more encompassing view on APS that acknowledges the growing importance of FinTech firms as intermediaries. By tracing the rise of financial centres old and new based on the location patterns of and investments in FinTech, they find that the growing importance of tech has also reshuffled the networked hierarchies between the incumbent financial centre of Mumbai and the emerging FinTech centre of Bangalore. A clear division of labour emerges with Mumbai acting as the centre of investment into the digitizing and platformizing financial industry, and Bangalore acting as the place where technological advancements are occurring. All this, they argue, is also taking place against a wider political-economic canvas where the Indian central state is creating the conditions amenable to the interests of their domestic tech firms. In that context, Migozzi et al. (2024) argue that the Fin-Tech-State triangle (Hendrikse et al., 2019) could be more meaningfully rephrased here as a Tech-Fin-State triangle to capture the relative power within the Indian APS complex as being tilted toward tech firms.

Continuing a networked-agglomerative view on APS restructuring, Trincado-Munoz et al. (2024) focuses on Europe and North America to explore whether digital transformations are reconfiguring broader hierarchies and structures of the world city network. Do digital technologies provide windows of opportunity for cities to rise within the world city network? Does the transformation to FinTech, LegalTech, Adtech, RegTech and so forth lead to an increasing proliferation of tech start-ups providing key bridges in the APS complex? Their findings indicate tentative affirmative answers to these questions. The paper uses a large scale near real-time dataset to understand whether the composition of the APS complex is changing and where this changing composition drives geographical changes in the world city network. The study provides evidence that within the world city network urban regions specialized in digital technologies are becoming more prominent. Nevertheless, a division of labour between world cities specialized in technological innovation and geographical brokerage remains visible. These results reaffirm that the world city network is not only a structure in competition but that it contains a division of labour where the APS complex ties together diverse regional specializations (Bassens et al., 2023).

With three papers offering nuanced evidence of financial centre and network changes in North America, Europe and Asia, the next set of papers shifts focus to particular APS markets and functions, with a distinct focus on finance. Zook and Grote (2024) focus on blockchain technology in finance as a critical case to evaluate whether disruptive disintermediation is affecting the APS complex as we know it. By drawing on commercial inventories and ethnographic data, they scrutinize the contemporary industry geographies, practices, and discourses around said ‘disruption’. Despite some applications that may have worked to decentralize finance, the current reality is more sobering. While there is the rise of new tech centres relevant for blockchain innovation, established financial centres clearly continue to play a central role. Similarly, blockchain is an important field of experimentation in finance, but it is mostly established financial institutions that are capturing new areas of applications, or new entrants that are taking over functions previously performed by financial institutions. In sum, while the rise of blockchain intermediaries (which are sometimes

anchored in tech centres beyond the financial centre shortlist) suggests we need an expanded notion of the APS complex to include tech centres, there has not (yet) been an erosion of the systemic power of financial institutions and the financial centres from which they are operating.

While blockchain technologies may present the most avant-garde area of potential APS dis/re-intermediation, [Robinson et al. \(2024\)](#) focus on a crucial, yet often overlooked, financial infrastructure shaping the global APS complex, namely the payment infrastructure provider SWIFT. Their study of what is often seen as the ‘plumbing’ infrastructure of the financial system is especially pertinent since the rise of FinTechs in the payments industry may at some point threaten the position of SWIFT and its shareholders (the world’s leading financial institutions) as rent-extracting obligatory passage points. The paper explains how the ‘co-opetive’ nature of SWIFT creates challenges for an easy transformation of legacy infrastructure, but [Robinson et al.](#) also pinpoint a number of ways in which SWIFT itself is being upgraded toward a platform model. Discussing recent developments, they find that SWIFT has been working to trace payments in a better way, speed them up, make them cheaper, and start mining the resulting data to create new fee-earning products. In sum, their research illustrates how the entry by new players into the core of the APS complex has offered competition but has not disrupted the intermediary role of a crucial plumbing infrastructure such as SWIFT. Taken together, evidence from both decentralized finance communities and the core plumbing infrastructure suggest that leading financial institutions, as core entities in the APS complex are shapeshifting to accommodate new competitive pressures, which are not yet undermining their systemic importance.

Issues of organizational change are more forcefully evidenced in the next set of papers that take the firm-level as the scale of analysis. Focusing on digital gamification techniques, which incorporate video gaming elements (rather than full-fledged games) into apps, [Lai and Langley \(2024\)](#) show that the gamification of FinTech economies is reshaping what and who counts as relevant business knowledge and actors in financial services. While financial and other established APS firms are developing new capabilities in gaming, design and data analytics to better attend to user attention and behaviour, new tech companies (e.g. user experience (UX) and user interface (UI) design firms, gaming companies) that might not fit traditional definitions of APS firms are also becoming significant actors in shaping FinTech intermediation. Their case examples from Asia also note that the development and usage of gamified FinTech apps in that region have been especially prominent compared to other geographical markets. The embrace of gamification techniques in Asian markets appear to sit more comfortably with widespread consumer enthusiasm for app-based solutions to financial and lifestyle goals, which has implications for changing geographies of innovation and knowledge production.

[Santos’ \(2024\)](#) paper, in turn, uses a cultural economy perspective to understand how large incumbent European banks are navigating the digital transformation of finance in different ways. By studying investor relations materials of BNP Paribas and ING, she examines how banks are incorporating FinTech solutions and strive to become the very platforms leading the digital transformation of the financial sector. The paper shows how digitization and platformization enable new organizational structures and new geographies of near-shoring and mid-shoring of back-office functions in finance, but still integrate them in seamless financial-services provision. Much like financialization requires shareholder value metrics, platformization is also requiring new metrics such as ‘user engagement’ to showcase evidence of digital transformation to investors. The paper also shows how digital transformation is forcing leading banks to navigate their potential dependence on core infrastructure such as cloud technology, with leading European banks developing private cloud infrastructures to avoid a mounting dependence on American Big Tech. Such a move is coherent with the wider EU’s position in the global political economy of finance geared toward technological sovereignty ([Bassens and Hendrikse, 2022](#)).

4. Cross-cutting observations

How do insights from these papers contribute to the four questions raised above? As geographers, we like to start with the *where* question. To what extent is a reworked APS complex amidst platformized global capitalism showing signs of a **geographical articulation** that is different from established global financial networks and world and global city networked hierarchies? Several papers give hints about this, either by comparing location rankings or composing a new index altogether. The world city archipelago now includes new ‘islands’ that were previously excluded: tech-centred cities like San Francisco, Berlin, or small offshore jurisdictions like Zug, Switzerland, are becoming entangled in the system of global intermediation, as highlighted by [Zook and Grote \(2024\)](#). [Migozzi et al. \(2024\)](#) meanwhile, show that for India this is not a matter of territorial/interurban competition when seen through the eyes of APS. Rather, there is a reworking of spatial divisions of labour across cities old and new tied together even more seamlessly through digital means ([Van Meeteren and Kleibert, 2022](#)). Where capitalist orchestration—that typical focus of world/global cities research—happens is hard to pinpoint as it increasingly involves platform-mediated acts of intermediation across world cities, tech valleys, and hyperscale data centres, and plugged into the lifeworld of customers in diverse markets. Although digitization allows for the off-shoring and mid-shoring of APS routine work, offshored activities are digitally tied into each other even more than before to enable embedded finance for clients ([Santos, 2024](#)). Further, one finds that to some extent the agglomerative dynamics of tech is overlaying world city networked hierarchies, as preeminent world cities like London and Paris are also becoming leading tech hubs. At the same time, as shown by [Migozzi et al. \(2024\)](#), financial and technological functions can be geographically separated, such as the Mumbai-Bangalore-Singapore example, where Mumbai functions as the place of proximity to the financial regulator, Bangalore as the site for tech innovation, and Singapore as the hub for international investment and legal advice.

A second question pertains to **sectoral and functional changes**. Given the shift in the modes of intermediation, are we witnessing an alteration of power relations within a now expanded APS complex? Are digitization and platformization diminishing or challenging the intermediary role of APS in general and financial institutions in particular? Studies in different APS settings and areas bring evidence of the contrary. As [Zook and Grote \(2024\)](#) show, the use of even the most disruptive and decentralizing technology (in principle) such as blockchain that gives rise to new intermediaries require social embedding. This means that the platformized APS complex remains an obligatory passage point despite or perhaps because of rapid technological transformation since the 2008 financial crisis. At the same time, the updated APS complex, as [Hendrikse et al. \(2024\)](#) and [Trincado-Munoz et al. \(2024\)](#) demonstrate, is also becoming structurally dependent on technologies that are typically not developed in-house, which generates forms of dependence on ICT providers (both incumbents and new startups) on a far larger scale than before. That could imply that the rents extracted from intermediation are further siphoned off to those places/firms that own, control and run these infrastructures. It thus appears that some areas of APS (and finance in particular) are more prone to reintermediation by market entrants: payments and cryptocurrency are clear examples where the bypassing of financial incumbents is evident in both mature and emerging markets (e.g., cryptocurrency and payments infrastructures in India, Adyen as a new intermediary in Amsterdam). The ‘plumbing’ infrastructure of global finance, as evidenced by the case of SWIFT ([Robinson et al., 2024](#)), remains collectively owned by leading financial institutions. While challenged by digital platforms, that infrastructure remains at the heart of global finance and grants globally-operating banks an infrastructural power that only BigTech firms can rival.

The mounting pressure from new intermediaries challenging incumbent APS does warrant looking into a third question, namely the

organizational transformation of APS intermediaries. As several papers illustrate, incumbent financial institutions are tapping into novel forms of expertise to incorporate this into their operational models. While this was initially to streamline back-end operations and cut costs, digital technologies are now increasingly implemented at the front-end mimicking data-centric platform models by FinTechs and BigTech. The cases of ING and BNPP are illustrative here, as both [Hendrikse et al. \(2024\)](#) and [Santos \(2024\)](#) show. More broadly, as illustrated by [Trincado-Munoz et al. \(2024\)](#), digital technologies are being adopted by other APS firms in law, advertising, with management consultants acting a lubricant of a platformizing APS complex. [Lai and Langley's \(2024\)](#) exploration of gamification in consumer FinTech also highlights new forms of socio-technical knowledges and specialist firms (such as in behavioural science, digital marketing, and UX and UI design) that are overlooked by current conceptualization of the finance-APS complex. Other than gamification, the wider organizational changes of financial intermediaries amid platformization can have notable consequences for end users, as [Santos \(2024\)](#) shows, since it coincides with wider processes of financial consolidation at a time when these intermediaries are increasingly embedded into the lifeworld of clients. In short, this growing entrenchment of finance in economy and society through digital platforms is likely to have implications for the structural capacity of APS firms to extract rents.

Finally, a fourth question is to what extent should these economic geographical processes be understood in **strategic-institutional terms**? The evolving power relations between incumbents and market entrants in an expanding APS complex are to be situated against a wider geographical political economic canvas. Both in the EU and in India, as shown by [Hendrikse et al. \(2024\)](#) and [Migozzi et al. \(2024\)](#), the state has been crucial in generating the regulatory conditions for the implementation of novel platform technologies, and hence the transformation of APS. This is most evident in Europe where the Second Payment Services Directive (PSD2) has pushed banks to open up and collaborate with Fintechs, which has reinforced the latter's market position. In India, the wider push for digital citizenship has enabled Fintechs to gain a more prominent role. The concrete composition and structure of the APS complex cannot be understood without understanding these wider shifts. This is a story of how governments see digitization and platformization as set of tools to enhance market competition (in the EU), but also a cornerstone of state-building, mobilizing digital finance as a way to reshape the relation between citizens and the state (as seen in India), and in doing so, installing forms of digitized financialization and state governance (cf. [Jain and Gabor, 2020](#)).

5. Conclusion and outlook

Looking back at more than six decades of APS economic geographies amid various rounds of global economic restructuring, it becomes evident that the APS complex—whether conceived as a set of functions, firms, sectors or networks—has periodically found ways to evolve whilst remaining crucial intermediaries. APS have shapeshifted from being vital intermediaries for globalization to obligatory passage points for financialization, reflecting capital's reorientation from industrialized to financialized capitalism. Looking back at the 2010s, it is not far-fetched to argue that APS have shapeshifted once again, this time reflecting financialized capital's embrace of digitization and platformization. Earlier rounds of globalization and financialization altered but did not undo their role as obligatory passage points. Similarly, the evidence in this themed issue suggests that digitization and platformization induces APS to reinvent themselves to remain crucial intermediaries.

Amid such digitized and platform-driven transformations, however, the networked hierarchies in the APS complex, long captained by finance and aided by a set of auxiliary functions, are increasingly challenged by the tech sector. While we are not observing outright displacement of APS firms, we do witness their rapid transformation in embracing key platform technologies and online and digital technology

more generally. In that process, new firms are crossing the boundaries of the APS complex and take over some previously sheltered activities. If anything, classic APS firms have become more dependent on the technologies and infrastructures by large tech firms that are not always reflected in the entrenched geographies of the well-known world cities or financial centres shortlist. Again, digitization and platformization does not lead to a major overhaul, but to more nuanced and expansive entanglements with places that were previously considered as less important sites for capitalist orchestration. A key implication is that scholarly understandings of APS intermediation, therefore, can no longer ignore the tech sector, for methodological and conceptual reasons. Contemporary capitalism is increasingly orchestrated not only out of networked APS firms residing in financial centres, but also by tech companies scattered over the globe.

While the current issue has only scratched the surface of unfolding processes, we see three fundamental questions for future research. First, if digitization and platformization deepens dependence on core tech infrastructure and technology, what are the implications for how we conceptualize APS as knowledge brokers? To what extent are localized and networked knowledge-based competitive advantages (and the rents they engender) increasingly 'infrastructural' in nature? How would these affect our conceptualization of APS as services, or more specifically the insourcing of infrastructure and technology? Second, and relatedly, returning to a classic concern of world and global cities research regarding capitalist orchestration, to what extent does that function originate in the strategic insertion of knowledge in global circuits of value organized by client firms? Is this orchestration more precisely situated in the oligopolistic control, ownership, and use over global platform infrastructure? This also generates questions about the clear dependence of the incumbent APS complex on the infrastructural power of central banks and financial plumbing infrastructure and how these are being transformed. Finally, what are the theoretical implications of digitizing and platformizing APS in terms of their role in wider economy and society? APS have long been catering to states and corporate clients, but platform technology is currently embedding these functions much more deeply and intimately into the life worlds of everyday consumers, which augments their prospects for future data-centred intermediation. It may seem farfetched to compare such developments to claims of technofeudalism ([Varoufakis, 2023](#)) linked to BigTech and surveillance capitalism. Still, it may be prudent to consider whether more classic incumbent APS intermediaries might encounter similar data-related controversies in the future and what their potential geographical, organizational, and ethical implications might be.

CRediT authorship contribution statement

David Bassens: Writing – original draft, Writing – review & editing.
Reijer Hendrikse: Writing – review & editing, Writing – original draft.
Karen P.Y. Lai: Writing – original draft, Writing – review & editing.
Michiel van Meeteren: Writing – original draft, Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

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