

Grants, sovereign loans and the appraisal of corridor investment: Transport infrastructure development in Hungary, 2010–2026

Brigitta Zsótér^{a,*}, Gábor Dániel Nagy^{b,1}

^a Department of Engineering Management and Economics, Faculty of Engineering, University of Szeged, Szeged, Hungary

^b Department of Applied Social Sciences, Juhász Gyula Faculty of Education, University of Szeged, Szeged, Hungary

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ABSTRACT

In this article, we examine how a small European Union member state has used transport infrastructure investment to reposition itself within European and Eurasian trade and production networks. Drawing on a qualitative case study of Hungary between 2010 and 2026, we combine documentary analysis of a structured corpus of official sources, process tracing with explicit evidentiary tests, and descriptive investment data to reconstruct the investment logic underlying three interlocking programmes: the externally financed reconstruction of the Budapest–Belgrade railway; the coupling of long-distance logistics corridors with record inflows of electric-vehicle and battery manufacturing investment; and the systematic extension of motorway and railway capacity towards national borders. We show that Hungarian transport policy during this period was optimized not primarily according to conventional welfare-economic appraisal criteria, but as a connectivity strategy intended to position the country as an interoperability hub between Asian, EU, and macroregional circuits of trade and capital. We test this strategic interpretation against the rival explanation that the investment pattern emerged from fragmented, domestically driven decisions that were rationalized only retrospectively. We conceptualize this pattern as a small-state corridor strategy: the deliberate allocation of corridor projects across parallel financing channels (EU cohesion and Connecting Europe Facility grants, the national budget, and non-EU sovereign credit), each governed by a distinct institutional regime, to purchase connectivity optionality. Throughout, we distinguish between documented policy intent, strategic complementarity, and causal effect, and show that 2010–2026 constitutes a completed construction phase rather than an assessable outcome cycle. Our findings extend the transport economics literature on corridor investment to the demand side of externally financed corridor development, and we identify implications for project appraisal, financing governance, and connectivity policy.

1. Introduction

Transport infrastructure investment has returned to the top of national and supranational policy agendas. Over the past decade, governments and international institutions have financed long-distance corridor programmes of unprecedented scale, from the overland rail corridors developed under the Belt and Road Initiative [1] to the European Union's trans-European transport network. These programmes pose a well-documented challenge to transport economics: very large infrastructure projects systematically exhibit cost overruns, demand shortfalls, and appraisal biases [2,3], while their sponsors frequently justify them by benefits (network position, industrial development,

option value) that conventional cost–benefit analysis captures only imperfectly [4]. Methodological advances in ex-post impact assessment are beginning to close this gap [5], and corridor-level welfare analysis shows that transport policy measures justified in the aggregate can fail on specific corridors [6]. Yet most of this literature analyses the supply side of corridor development, that is, the programmes of the financing institutions. Far less attention has been paid to the demand side: how small open economies located along international corridors convert transit position into economic advantage, and what this means for the appraisal, financing, and management of the transport systems they build.

We address this gap through a study of Hungary between 2010 and

* Correspondence to: University of Szeged, Faculty of Engineering, Mars tér 7, Szeged H-6724, Hungary.

E-mail addresses: zsoterb@mk.u-szeged.hu (B. Zsótér), nagy.gabor.daniel@szte.hu (G.D. Nagy).

¹ Scopus Author ID: 57202373995

2026. The period is bounded by two parliamentary elections and spans sixteen years during which a single governing coalition held office continuously; the investment decisions examined were therefore taken by one political principal under a consistent set of stated priorities. It also corresponds to the construction phase of the flagship projects: the Hungarian section of the Budapest–Belgrade railway entered freight operation in February 2026, while the principal border-oriented motorway extensions had opened by 2025. We therefore treat 2010–2026 as a completed investment and construction phase whose decision record can be reconstructed in full, rather than as a completed outcome cycle in which realized demand and economic performance can already be evaluated; this distinction governs the claims made throughout the article. Hungary offers an analytically privileged case for three reasons. First, it was the first EU member state to sign a BRI memorandum of understanding with China in 2015 and hosts the largest Chinese-financed transport project in the Union, the reconstruction of the Hungarian section of the Budapest–Belgrade railway [7,8]. Second, the country simultaneously absorbed exceptional volumes of EU cohesion funding for transport, making it a natural setting in which to observe the interaction of distinct external financing regimes within a single national network [9]. Third, Hungarian policy documents in this period explicitly framed connectivity as an economic development priority, linking transport corridors to industrial policy and to closer economic ties with neighbouring cross-border regions [10,11].

We ask three questions. First, what investment logic governed Hungarian state-led transport infrastructure development between 2010 and 2026, how can that logic be established evidentially rather than inferred from policy narratives alone, and how does it depart from conventional welfare-economic appraisal? Second, how were the financing and governance arrangements of the flagship Budapest–Belgrade project structured, and what do they reveal about the trade-offs of externally financed corridor development, including its opportunity cost? Third, what are the implications for transport economics and management when infrastructure programmes are optimized for connectivity-based positioning rather than for measured transport demand?

Our contribution is threefold. Conceptually, we develop the notion of

the small-state corridor strategy, defined as the deliberate allocation of corridor projects across parallel financing channels (EU grants, the national budget, and non-EU sovereign credit), each governed by a distinct institutional regime, to build corridor capacity whose expected returns are network-strategic (hub positioning, investment attraction, option value) rather than narrowly transport-economic. We specify how this construct differs from the adjacent concepts of strategic coupling, infrastructure-led development, corridor governance, hub positioning, and network option value, and identify which of its elements are observable beyond the Hungarian case (Table 1). Empirically, we provide the first integrated account linking the Budapest–Belgrade railway, the electric-vehicle and battery investment wave, and the border-oriented expansion of the Hungarian motorway and railway network within a single strategic configuration. This account is supported by a project and financing matrix (Table 2), a corridor map (Fig. 1), a structured documentary corpus (Supplementary Material S1), and an explicit statement of the evidentiary status of each principal claim, distinguishing documented intent, inference from the sequence of events, and plausible mechanism (Table 3). We also confront the strategic interpretation with the rival reading that the pattern reflects fragmented, domestically driven decisions rationalized after the fact, and construct a qualitative counterfactual for the flagship railway (Table 4). For transport economics and management, we specify how network-strategic objectives reshape standard appraisal, financing, and procurement practices, and derive criteria by which such projects can nevertheless be evaluated and governed. Our study thereby speaks directly to the emerging agenda of this journal, which spans methodological advances in assessing the economic impacts of transportation infrastructure investment [5], corridor-level welfare evaluation of transport policy interventions [6], and the management of service and technology innovation in transport systems [12].

The article is structured as follows. Section 2 reviews the literature on megaproject appraisal, long-distance corridor economics, the Hungarian economic context, and the domestic political economy of infrastructure allocation in Central and Eastern Europe, and derives the analytical framework, its differentiation from adjacent concepts, and the rival expectations against which it is tested. Section 3 describes the case

Table 1
The small-state corridor strategy and adjacent concepts.

Concept	Core claim and unit of analysis	Element shared with the small-state corridor strategy	What it does not capture in the Hungarian configuration	Key references
Strategic coupling (global production networks)	Regional assets are matched to the strategic needs of lead firms through the agency of regional institutions; unit: region–firm nexus	Supplies the mechanism for dimension (i): corridor and terminal capacity as a coupling asset offered to lead firms	Silent on how coupling assets are financed; treats infrastructure as one asset among many; no account of regime allocation or governance costs	[13–15]
Infrastructure-led development	Re-emergence of state-led spatial strategies in which large infrastructure programmes are expected to induce economic transformation; unit: national or macro-regional territory	Objective function beyond user benefits; outward territorial orientation	No account of arbitrage between institutional financing regimes, of the resulting governance costs, or of the small-state position between competing financiers	[8,16]
Corridor concept (transport geography)	Multimodal bundles of infrastructure and flows and the governance problems, including chokepoints, that they create; unit: the corridor	Dimension (iv): the corridor as the unit of investment and the border crossing as its critical node	Describes the object of investment, not the investing state's objective function or its financing choices	[17,18]
Hub or gateway positioning	Intermediate nodes capture flows between forelands and hinterlands and derive rents from them; unit: node or port region	One of the intended returns within dimension (i)	Presupposes traffic; does not explain acceptance of a weak appraisal record or the restriction of disclosure	[19]
Network option value / real options	Connectivity that may be used later has a value that user-benefit appraisal omits; unit: project valuation	Rationale for accepting a weak stand-alone business case	Explains why a state might accept the price of an option, not why it would obscure rather than price it; no financing or governance content	[4,20]
Polyalignment / geoeconomic bridging	A small state positions itself between competing geoeconomic blocs through industrial policy; unit: the state	The small state as an active arbitrageur rather than passive terrain	Operates at the level of industrial policy; no content on transport appraisal, financing regimes, or territorial pattern	[21]
Small-state corridor strategy (this article)	Conjunction of (i) a network-strategic objective function, (ii) a parallel-channel financing architecture with portfolio-level diversification and regime allocation, (iii) governance costs insensitive to appraisal, and (iv) a concentric, border-oriented territorial pattern; unit: the national corridor portfolio	—	Observable outside Hungary through: stated justification versus published appraisal; distribution of projects across regimes and location of the weakest appraisal records; bidder numbers, disclosure restrictions and cost escalation by regime; alignment of network termini with international corridor designations	This article

Table 2

Project and financing matrix: principal corridor investments in Hungary, 2010–2026 (documented values; net or gross as reported; n.p. = not published). Document identifiers refer to [Supplementary Material S1](#).

Project (section; length)	Mode; corridor alignment (Regulation (EU) 2024/1679)	Financing channel and institutional regime	Amount (documented)	Timing (decision → opening)	Stated strategic purpose (\$1 document)
Budapest–Belgrade railway, Hungarian section (Soroksár–Kelebia; c. 150–160 km; double track, electrified, 160 km/h, ETCS L2)	Rail; Western Balkans–Eastern Mediterranean corridor (Budapest–Belgrade)	Bilateral sovereign credit; Export–Import Bank of China loan for 85% (USD 1.855 bn; 2.5% fixed; 20 years; 5-year grace); national budget 15%; intergovernmental-agreement regime; documentation classified to 2030	Contract c. HUF 590 bn (2019); HUF 949 bn incl. financing costs (2017 official answer); c. HUF 1000 bn (2026 coverage)	2013 announcement; 2015 agreement; 2019 contract; 2020 loan; construction 2021–2025; freight from Feb 2026; passenger service pending	EU terminus of the Land–Sea Express Route; Central European logistics hub (A02, A03, A11, A17)
Budapest–Belgrade railway, Serbian sections (Belgrade–Novi Sad 75 km; Novi Sad–Subotica–Kelebija 108 km; 200 km/h) [context]	Rail; same corridor	Chinese (northern section: 85% Export–Import Bank) and Russian state credit	Northern section c. EUR 1.0 bn	Opened Mar 2022 and Oct 2025	Land–Sea Express Route (A16, A23)
M43 motorway, Makó–Csanádpalota (Romanian border); 23 km	Road; Rhine–Danube corridor (Budapest–Arad)	EU cohesion (2007–2013 programme), c. 85% EU / 15% national; EU procurement and cohesion rules	HUF 46.5 bn net	Opened Jul 2015	Link to Arad and Timișoara; integration into the EU expressway network (C10–C11)
M4 motorway, Berettyóújfalu–Nagykeréki (Romanian border); 26.5 km	Road; Baltic Sea–Black Sea–Aegean Sea corridor (Debrecen–Oradea)	EU cohesion (IKOP 2014–2020), 85% EU	HUF 95.2 bn	Opened Aug 2020	Border connection to Oradea (C12–C13)
M4 expressway, Cegléd–Abony, Abony–Törökszentmiklós, Törökszentmiklós–Kisújszállás; 88 km	Road; east–west axis towards the Romanian border	National budget (100%)	HUF 26.3 bn net; HUF 125.5 bn net; HUF 170.1 bn gross	Opened 2019/2020; Feb 2022; Dec 2025	Extension of the M4 towards the eastern border (C14–C16)
M44 expressway, Kecskemét–Tiszakürt–Kondoros–Békéscsaba; c. 125 km	Road; south-eastern axis feeding the Romanian border	National budget (100%)	Tiszakürt–Kondoros HUF 145.8 bn net; Kondoros–Békéscsaba HUF 41.4 bn; other sections n.p.	Opened Oct 2019 – Apr 2025	Connection of the south-eastern region to the network and towards Arad (C17–C18)
M30 expressway, Miskolc–Tornynosémeti (Slovak border); 56.6 km	Road; Baltic Sea–Black Sea–Aegean Sea corridor / Via Carpatia (Košice–Miskolc)	EU cohesion (IKOP 2014–2020)	HUF 197.1 bn (approved support)	Opened Oct 2021	Completion of the Via Carpatia link to Košice (C19–C21)
M6 motorway, Bóly–Ivándárda (Croatian border); 20 km	Road; Western Balkans–Eastern Mediterranean corridor, Corridor Vc (Budapest–Osijek–Sarajevo)	National budget (EU support HUF 5.8 bn for preparation only)	HUF 88.7 bn net	Bóly–Lippó May 2024; border link Oct 2025	Connection to the Croatian A5 and Corridor Vc (C22–C24, C39)
M85 expressway, Csorna–Sopron, and Sopron tunnel to the Austrian border; 51 km + 4 km	Road; link to the Austrian network	National budget (100%)	HUF 153.2 bn gross; tunnel HUF 67.2 bn gross	Opened Dec 2020; tunnel Dec 2024	Connection of Sopron to the Austrian border (C25–C26)
M49 expressway, Ökörítőfülpös–Csenger (Romanian border); 17.6 km	Road; link towards Satu Mare	National budget (100%)	HUF 141.9 bn	Construction 2024–2027	Border connection to Satu Mare (C27)
Záhony wide-gauge transshipment zone: station and yard upgrades; East–West Gate terminal (Fényeslitke)	Rail/intermodal; Mediterranean corridor (Budapest–Záhony–Ukraine)	National budget (government resolution 2022); private investment with state support	HUF 12.4 bn (public); EUR 73 m incl. EUR 8.2 m state support (terminal)	Resolution Feb 2022; terminal opened Oct 2022	Eurasian intermodal gateway alternative to the Polish hub (B17–B18)
Szeged–Röszke line reconstruction and electrification; 13 km	Rail; Western Balkans–Eastern Mediterranean corridor (Szeged–Subotica)	National budget	HUF 40.9 bn (allocation 2021)	Allocation 2021; works 2022–2024	Cross-border link to Subotica (B19)
Budapest–Hatvan (line 80) modernization; 53 km	Rail; TEN-T core network, Budapest–Miskolc axis	EU (IKOP/CEF) and national budget	c. HUF 160 bn net	Completed Oct 2022	Domestic main-line modernization (C31)
Püspökladány–Ebes (line 100) modernization; 31 km	Rail; Mediterranean corridor (Budapest–Debrecen–Záhony)	EU cohesion (IKOP 2014–2020)	HUF 75 bn	Completed Nov 2021	Domestic main-line modernization (C32)

(continued on next page)

Table 2 (continued)

Project (section; length)	Mode; corridor alignment (Regulation (EU) 2024/1679)	Financing channel and institutional regime	Amount (documented)	Timing (decision → opening)	Stated strategic purpose (S1 document)
Békéscsaba–Lőkősháza (Romanian border) double-tracking; c. 30 km	Rail; Rhine–Danube corridor (Budapest–Arad)	EU co-financed (share n.p.)	c. HUF 127 bn contract (2021), subsequently escalated	Contract 2021; under construction	Border section towards Arad (C34)
Southern Railway Ring (Déli körvasút), Budapest; 6 km	Rail; Budapest node	EU Connecting Europe Facility grant and national budget	CEF grant HUF 113 bn; total HUF 218–374 bn (documented range)	Under construction	Capacity at the Budapest node (C36)

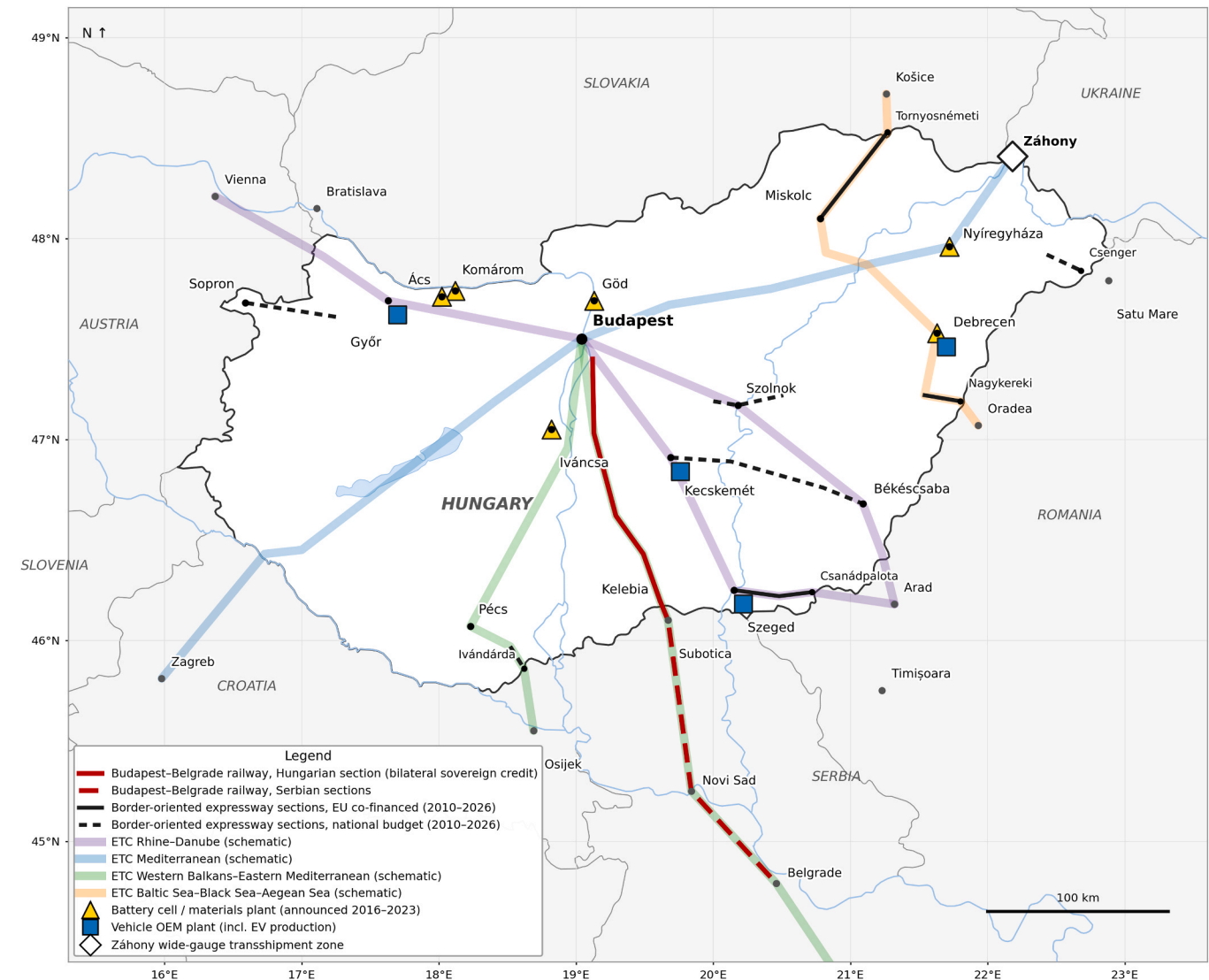


Fig. 1. The Hungarian corridor system, 2010–2026: the Budapest–Belgrade railway (Hungarian section financed by bilateral sovereign credit; Serbian sections), the border-oriented expressway sections opened or under construction between 2010 and 2026 by financing channel, the schematic alignments of the four European Transport Corridors crossing Hungary under Regulation (EU) 2024/1679, the Záhony transshipment zone, and the locations of the principal battery and vehicle plants discussed in Section 4.2. Corridor alignments are simplified; base map from Natural Earth. Source: authors' compilation from Supplementary Material S1 (documents C01–C04, C10–C27, B08–B18).

study methodology, the documentary corpus, and the process-tracing logic. Section 4 presents the empirical results across three embedded cases and a counterfactual assessment of the flagship project. Section 5 discusses the findings against the framework, adjudicates between the strategic and fragmented-politics interpretations, and draws out theoretical and policy implications. Section 6 concludes with contributions, limitations, and directions for future research.

2. Literature review and analytical framework

2.1. Beyond user benefits: appraisal, megaprojects, and network option value

A first pillar of our framework is the literature on the appraisal and governance of very large transport projects. Megaproject research documents pervasive cost escalation and benefit shortfalls, driven by

Table 3

Evidentiary status of the principal claims (documented intent; inferred from sequence; plausible mechanism). Document identifiers refer to [Supplementary Material S1](#); test types follow [Section 3.3](#).

Claim	Evidentiary level	Principal evidence (S1)	Rival explanation	Assessment (test type)
The Budapest–Belgrade railway was selected for hub positioning rather than for measured demand	Documented intent	2014 guidelines; 2015 agreement and Act XXIV of 2016; project description; ministerial statements 2015–2025 (A02, A03, A11, A17); absence of published appraisal (A06)	Prestige or contractor-driven project rationalized as strategy	Survives the hoop test: objective precedes commitment, is backed by costly acts, and is consistent across audiences; smoking-gun evidence unavailable while documentation is classified, so the interpretation is retained, not confirmed
The railway's economics were unpriced: no published appraisal, cost escalation, classification	Documented	A05–A06, A09, A25	—	Documented; consistent with strategic misrepresentation and with a sincere strategy alike (non-discriminating)
Corridor and terminal development were pursued as complements of FDI attraction	Documented intent (generic criterion); inferred from sequence and co-location	Battery Strategy 2030 (B03); investor statements [11]; sequence and co-location (Fig. 1)	Subsidies, EU market access, existing automotive base, labour market	Hoop passed for complementarity; straw-in-the-wind only for any causal reading
Corridor investment generated or materially caused the EV/battery FDI wave	Not claimed	—	Public support of c. HUF 1500 bn (B14); market access; industrial base [22,23]	Cannot be tested with a single-country documentary design
Projects were allocated across parallel financing channels at portfolio level, with one decisive instance of regime allocation	Documented (allocation); plausible mechanism (motive)	Table 2; A08, A14, C05, C07, C10–C27	Channel choice driven by fund availability alone	Allocation documented; the motive for placing the flagship on the bilateral track from the outset (2013–2015) is a plausible mechanism (the EU channel would have required a published appraisal and open procurement), corroborated only after the fact by the 2016 Commission inquiry; not inferred from sequence
Governance costs were higher on the bilateral track than on the EU track	Documented	A05–A07, A09, A13, A25 versus C10–C21	—	Documented for disclosure and cost escalation; procurement competition compared only at the level of contract structure
The border-oriented geometry reflects a connectivity objective	Documented intent; behavioural congruence	C08–C09; border termini incl. nationally financed sections not subject to EU network rules (Table 2); western as well as eastern extensions	Electoral geography and regional distributive politics [24,25]	Hoop passed on termini and direction; regional-level evidence observationally equivalent between interpretations
Contracting, timing, and the ordering of unfunded priorities were shaped by domestic political economy	Inferred from pattern; supported by literature	Contractor concentration (A07, C14–C27); opening dates before elections; late funding of the Budapest agglomeration strategy (C06, C35)	Programme-period closure; construction cycles; cohesion eligibility of Central Hungary	Straw-in-the-wind; weight derived from [24,26–28]
2010–2026 is a completed construction phase, not an assessable outcome cycle	Documented	A18–A20; B08–B10	—	Documented; outcome claims withheld throughout

optimism bias and strategic misrepresentation in ex-ante estimates [2, 3], and implementation-risk studies confirm that railway investments in Central and Eastern Europe face distinctive planning, procurement, and coordination risks [29]. At the macroeconomic scale, the megaproject research programme also warns that infrastructure investment undertaken without appraisal discipline can generate economic fragility rather than growth, because the resulting debt may outlast benefits that fail to materialize [30]. A complementary strand argues that the value of some infrastructure investments cannot be captured by user-benefit appraisal alone: network position, connectivity options, and induced investment constitute benefits, and risks, that call for comprehensive evaluation frameworks [4], and the real-options literature provides a formal language through which such option value can, in principle, be priced [20]. Externally financed railway megaprojects add a further governance layer, as the arrangements linking lenders, contractors, and host administrations shape outcomes in ways that standard appraisal does not register [31].

Transport economics has traditionally approached infrastructure through the lens of welfare appraisal: projects are justified by user benefits, wider economic impacts, and accessibility gains, evaluated through cost-benefit analysis and network modelling [32]. The empirical literature on CEE confirms that transport investment can support regional development, but that effects are strongest in early network-building phases and depend on complementary conditions [9]. The strategic turn in infrastructure investment poses a direct challenge to this apparatus: when the objective function of the investing state

includes hub positioning, network option value, or the attraction of strategically coupled foreign direct investment (FDI), observed project portfolios will systematically diverge from what appraisal alone would select. Specifying and evidencing that divergence is a core task of our analysis.

2.2. Long-distance rail corridors, external financing, and Central and Eastern Europe

The second pillar concerns long-distance Eurasian rail corridors and their financing. The Budapest–Belgrade railway is the largest externally financed transport project in the EU: financed predominantly by Export–Import Bank of China loans and built by Chinese state-owned railway companies in consortium with local partners, it extends the rail axis connecting the port of Piraeus with Central Europe [7,8]. Comparative research on externally financed railway megaprojects highlights adaptive governance and the sensitivity of outcomes to host-country institutions [31], while analyses of corridor financing call for granular assessment of loan terms, risks, and borrower agency rather than generalized narratives [33]. Across Central and Eastern Europe, the implementation of corridor-linked investment has been uneven and concentrated in a small number of countries, with Hungary the principal case [34,35], and recent work documents both the FDI reorientation accompanying Hungary's Eastern Opening policy and the political-economic paradoxes of its battery-industry strategy [22,36].

A complementary literature examines the freight economics of

Table 4

Qualitative counterfactual: what the documented cost of the Hungarian section of the Budapest–Belgrade railway would have financed elsewhere in the Hungarian transport system, on a construction basis (HUF 590–750 billion: the 2019 contract value and the 2017 pre-contract estimate) and on a full-cost basis (HUF 949 billion including financing costs, 2017 official figure). Benchmarks are nominal orders of magnitude from [Supplementary Material S1](#), not adjusted for inflation across years.

Benchmark	Documented value (\$1)	Equivalent, construction basis (HUF 590–750 bn)	Equivalent, full-cost basis (HUF 949 bn)	Transport-economic character of the alternative
EU transport operational programme (IKOP) 2014–2020, total envelope	EUR 3.92 bn, i.e. c. HUF 1200–1300 bn at 2015–2019 exchange rates (C05)	c. 45–60% of the seven-year programme	c. 75–78% of the seven-year programme	Projects appraised under EU rules; measured demand
Budapest agglomeration railway strategy (2021), first decade	c. HUF 1000 bn to 2030 (C35)	c. 0.6–0.75 × the first decade	c. 0.95 × the first decade	Highest demand density in the country; measured suburban demand
Modernization of conventional main lines to 120–160 km/h (double track, signalling)	HUF 2.4–3.0 bn per km (C31–C33)	c. 200–310 km of main line	c. 315–395 km of main line	Existing demand on the busiest domestic axes; network of c. 7400 km (C40)
Railway company's annual track renewal budget	HUF 20–23 bn per year (C38)	c. 26–38 years of renewal	c. 41–47 years of renewal	Backlog reduction; 4000–5000 km in need of modernization (C37)
Expressway construction, standard inter-urban sections (M44, M85, M30, M4 border)	HUF 2.4–3.6 bn per km (C12, C17, C19, C25)	c. 165–310 km	c. 265–395 km	Access to industrial zones; missing east–west links
Expressway construction, recent border sections (M6, M49)	HUF 4.5–8.1 bn per km (C22, C27)	c. 75–165 km	c. 115–210 km	As above, at 2024–2027 price levels
Suburban rail (HÉV H5) modernization including rolling stock	c. HUF 200 bn (C35)	c. 3–4 programmes	c. 4–5 programmes	Measured urban demand; modal-shift potential
Flagship itself, for comparison	Pre-reconstruction c. 10–12 train pairs per day in total traffic at the border (2021); Hungarian–Serbian rail freight –42% 2019–2023 (A22); c. 6 freight trains per day, peak 14, in April 2026 (A19); Serbian projection + 33,000 containers per year by 2025 (A13)	—	—	Transit demand contingent on decisions and investments outside Hungary; no published appraisal

Eurasian corridors. Studies of the China Railway Express document the rapid structural evolution of the network [37], its environmental and productivity effects [38,39], and firm-level effects on production systems, exports, and innovation along the route [40,41]. Changed transit conditions on the northern routings after 2022 reorganized Eurasian rail freight flows and raised the premium on southern alternatives, a shift that directly affects the traffic rationale of the Piraeus–Belgrade–Budapest axis. Programme-level reviews of the first decade of Eurasian corridor development report heterogeneous economic results across host regions [1], reinforcing the need to study individual corridor projects in their concrete economic settings.

2.3. The Hungarian economic context: FDI reorientation, automotive integration, and cross-border connectivity

Hungary's foreign economic policy after 2010 assigned explicit priority to diversifying trade and investment relations towards East Asia, institutionalized in the Eastern Opening policy first articulated in the 2011 foreign economic strategy and announced in 2012. Its measurable outcome was a pronounced reorientation of FDI patterns: empirical analyses document that Chinese investment into Hungary multiplied over the following decade and increasingly targeted strategic manufacturing sectors [11,36,42]. Firm-level and sectoral studies confirm Hungary's emergence as the principal Central and Eastern European destination of Chinese capital, and they identify EU market access, logistics endowments, and state investment promotion as the decisive locational factors [10,11,23]. Measurement caveats arising from conduit financial centres apply to all such FDI statistics [42].

Two further strands complete the picture. First, Hungary is a textbook integrated periphery of the European automotive industry [43,44], whose transition to electromobility created a window for battery-related FDI attraction that national policy pursued with exceptional subsidies [22,45]. The social reception of that strategy proved contentious, as the local environmental and resource-use debate surrounding the CATL gigafactory in Debrecen demonstrated [46]. Second, Hungary's location gives cross-border transport development a structural economic

dimension: the country borders seven states, several of which host dense commuting, trade, and supply-chain linkages with Hungarian regions, and cross-border accessibility is a recognized determinant of regional development outcomes across Central and Eastern Europe [9]. Cross-border network extension is therefore never only a matter of domestic traffic: it is also an instrument of macroregional economic integration.

2.4. The domestic political economy of infrastructure allocation

A fourth strand concerns the domestic political economy of infrastructure allocation, which any strategic interpretation of a national investment pattern must confront. The literature on Central and Eastern Europe is explicit that the spatial pattern of transport investment is shaped by domestic distributive politics at least as much as by connectivity objectives, and that EU co-financing does not neutralize this influence [9,47]. For Hungary specifically, three mechanisms are documented in peer-reviewed work. First, allocation: discretionary state subsidies to municipalities respond to electoral incentives [26], grant schemes for local government exhibit pork-barrel patterns [48], and targeted rural infrastructure spending measurably mobilizes core government support [24]. Second, procurement: Hungarian public contracting, including EU-funded contracting, shows elevated corruption risk and reduced competition, which the state-capture literature interprets as the systematic channelling of public resources to politically connected firms [27,28]. Third, electoral geography: government support has a pronounced core–periphery structure, with rural and eastern peripheries constituting the electoral base [25], so that investment in lagging eastern regions is simultaneously consistent with cohesion policy, with connectivity policy, and with distributive politics. This literature yields a rival set of expectations against which any strategic interpretation must be tested: over-investment in politically strategic regions, under-investment in opposition areas, project timing aligned with electoral cycles, contractor concentration, and connectivity language attached to decisions after they were taken. [Section 2.5](#) formalizes these rival expectations, and [Sections 4.3 and 5.2](#) assess them against the

record.

2.5. Analytical framework, concept differentiation, and expectations

Synthesizing these literatures, we analyse Hungarian transport policy as a small-state corridor strategy along four dimensions. (i) Objective function: project selection privileges connectivity-based influence, hub positioning, and strategically coupled FDI attraction over appraised user benefits; the strategic coupling of regional assets to global production networks [13] supplies the hypothesized mechanism linking corridors to investment. (ii) Financing architecture: the state operates parallel financing channels—EU grants governed by cohesion and TEN-T rules, the national budget governed by domestic public-finance and procurement law, and non-EU sovereign credit governed by bilateral agreements—and allocates individual projects among them according to procedural feasibility and financing conditions rather than the cost of capital alone. Three mechanisms must be distinguished: project-level co-financing, in which several channels fund the same project; portfolio-level diversification, in which different projects are financed through different channels; and regime allocation, in which a project is deliberately placed in, or moved to, the channel whose appraisal and procurement discipline it can satisfy. Our claim concerns the second and third mechanisms; the first occurs only in the routine sense that every EU-co-financed project carries national co-financing, and it did not occur across the bilateral and EU regimes. (iii) Governance costs: strategically motivated projects exhibit reduced procurement competition, restricted information disclosure, and cost escalation, because their strategic returns are insensitive to appraisal discipline. (iv) Territorial pattern: network expansion is oriented outwards to border regions, producing a concentric corridor geometry centred on Budapest.

The construct must be distinguished from five adjacent concepts with which it shares certain elements (Table 1). Strategic coupling in global production network theory explains how regional assets are matched to the strategic needs of lead firms [13–15]; it provides the mechanism for dimension (i), but is silent on how coupling assets are financed and treats infrastructure as one asset among many. Infrastructure-led development describes the re-emergence of state-led spatial strategies in which large infrastructure programmes are expected to induce economic transformation [16]; it captures the objective function, but not financing arbitrage between institutional regimes or the resulting governance costs. The corridor concept in transport geography focuses on multimodal bundles of infrastructure and flows and on the governance problems, including chokepoints, that they create [17,18]; it describes the object of investment rather than the investing state's strategy. Hub or gateway positioning in port and hinterland studies explains how intermediate nodes capture flows between forelands and hinterlands [19]; it identifies one of the intended returns but presupposes traffic that, in our case, remains to be generated. Network option value, finally, provides a valuation logic for connectivity that may or may not be used [4,20]; it explains why a state might accept a weak stand-alone business case, but not why it would obscure that case rather than price it. What the small-state corridor strategy adds is the conjunction of these elements: an objective function derived from strategic coupling and hub positioning, a financing architecture that exploits parallel institutional regimes, and governance costs arising from the insensitivity of strategic returns to appraisal discipline, together producing a recognizable territorial pattern. Recent work on Hungary's polyalignment between competing geoeconomic blocs [21] similarly treats the small state as an active bridging agent, but operates at the level of industrial policy rather than transport investment appraisal and financing.

Each dimension has observable implications outside Hungary. Dimension (i) predicts that flagship corridor projects are justified in official documents by position and investment attraction rather than by demand, and that no user-benefit appraisal is published or that published appraisals are decoupled from the decision. Dimension (ii) predicts that a state's corridor portfolio is spread across at least two

institutional regimes and that the projects with the weakest appraisal records are found in the regime with the weakest appraisal requirements. Dimension (iii) predicts lower bidder numbers, longer disclosure restrictions, and larger cost escalation in that regime than in the others. Dimension (iv) predicts that network extensions terminate at borders aligned with international corridor designations rather than at the last major domestic node. Comparable configurations can be sought, for example, in Serbia, Greece, or the trans-Caspian states, and each prediction can be falsified with public documents.

Against these expectations stands a rival interpretation drawn from Section 2.4, which we label the fragmented-politics interpretation. It predicts (a) that connectivity language postdates rather than precedes project commitments; (b) that the spatial pattern tracks electoral geography and regional distributive claims rather than corridor designations, with terminations at domestic nodes; (c) that timing tracks electoral cycles; (d) that contractor selection tracks political connection; and (e) that the configuration lacks internal consistency across projects and financing channels. The two interpretations are not mutually exclusive, and Section 5.2 spells out the mixed result that the record in fact supports. Sections 4 and 5 assess the empirical record against these expectations.

3. Materials and methods

3.1. Research design and case selection

We employ a qualitative, theory-guided single-country case study with three embedded units of analysis: (a) the Budapest–Belgrade railway reconstruction; (b) the BRI-linked logistics and electric-vehicle/battery FDI nexus; and (c) EU-co-financed and nationally financed corridor and cross-border network development. Case study methods are appropriate where the phenomenon of interest, the investment logic of an infrastructure programme, is not directly observable and must be reconstructed from the configuration of decisions, financing structures, and stated justifications over time. We select Hungary as a crucial case: if transport policy anywhere in the EU follows a network-strategic rather than welfare-economic logic, it should be observable in the member state with the deepest simultaneous exposure to Chinese and EU infrastructure financing. The continuity of the governing coalition between the 2010 and 2026 elections strengthens the design: the decision record belongs to a single principal, so inconsistencies cannot be attributed to changes of government, and the rival fragmented-politics interpretation must locate fragmentation within a single administration rather than between successive administrations.

3.2. Documentary corpus and source selection

The documentary analysis rests on a structured corpus of 87 primary and secondary sources assembled for the three embedded cases and listed in full, with identifiers, issuing bodies, dates, document types, access routes, and the claims each supports, in Supplementary Material S1. The corpus comprises eight categories: (1) government strategies (the 2011 foreign economic strategy that first articulated the Eastern Opening, the 2014 National Transport Infrastructure Development Strategy adopted by government decision, the 2016 Irinyi Plan, and the 2022 National Battery Industry Strategy 2030); (2) legislation (the acts promulgating the 2015 Hungary–China intergovernmental agreement and its annex, through which the text of the agreement itself is analysed, and the 2020 act classifying the railway project's documentation); (3) parliamentary materials (the 2014 resolution adopting the National Development and Territorial Development Concept, the debate on the 2020 classification act, and written questions and answers on project costs); (4) multilateral cooperation guidelines and intergovernmental instruments (the 2013 Bucharest and 2014 Belgrade China–CEE guidelines and the 2014 trilateral memorandum); (5) EU documents (Regulations (EU) No 1315/2013, No 1316/2013 and 2024/1679, the

2014–2020 Integrated Transport Operational Programme, the 2022 Council implementing decision under the conditionality regulation, and Commission corridor descriptions); (6) project communications (the official project pages of the national investment agency for each motorway section, the railway company's project description, and ministerial statements at contract signature, ground-breaking, and opening); (7) statistical sources (the Hungarian Central Statistical Office network series, the investment promotion agency's annual results, the MERICS–Rhodium Chinese FDI series, and terminal operators' throughput reports); and (8) investigative and specialist reporting used only where official documents are classified or silent, and flagged as such.

Sources were selected in three steps. We first identified every legally binding or officially adopted act bearing on the three embedded cases through the National Legislation Database, the parliamentary records, the EU legal database, and the government's document repository, using the project and programme names as search terms. We then added, for each project in the financing matrix (Table 2), the official project page or completion communication that records its length, cost, financing source, and stated purpose. Finally, we added statistical series and secondary reporting to fill the gaps left by classification, applying the rule that any figure not available from an official source is reported as a documented range with its provenance stated. Inclusion was restricted to dated documents whose issuing body could be identified; undated promotional material was excluded. The corpus is not a sample: it is intended to be exhaustive for categories (1) to (5) and representative for categories (6) to (8).

3.3. Process-tracing logic and the problem of retrospective justification

Process tracing is used to reconstruct the decision sequence of the flagship railway project and, more selectively, of the corridor–FDI nexus and the border-oriented road programme. We follow the test typology of the methodological literature, which classifies pieces of evidence by whether they are necessary and/or sufficient to sustain an interpretation: straw-in-the-wind evidence is neither, hoop evidence is necessary but not sufficient, smoking-gun evidence is sufficient but not necessary, and doubly decisive evidence is both [49,50]. The strategic interpretation and the fragmented-politics interpretation are treated as rival hypotheses, and each piece of evidence is assigned a test type with respect to both (Supplementary Material S1, Part B).

Because the analysis makes claims about the motivations underlying project selection, we must distinguish evidence of actual decision logic from retrospective policy justification and public narrative, a distinction the megaproject literature on strategic misrepresentation insists upon [3]. We apply four criteria. First, temporal precedence: a stated objective counts as evidence of decision logic only if it is documented before the commitment it purportedly explains; connectivity language that appears only in completion communications is treated as narrative. Second, costly commitment: statements are weighted by whether they were accompanied by legally or financially consequential acts (statutory promulgation, loan agreements, classification statutes, budget allocations), on the reasoning that costly action reveals preferences more reliably than communication. Third, cross-audience consistency: an objective stated consistently to domestic, EU, and Chinese audiences, and in technical as well as promotional documents, is more credible than one confined to a single audience. Fourth, behavioural congruence: the interpretation must also account for what was not done, including the absence of a published cost–benefit analysis, the choice of financing channel, and the termination points of road extensions. Evidence that passes all four criteria is classified as documented intent; evidence that rests on the ordering of events is classified as inferred from sequence; and evidence that rests on theoretical expectation is classified as plausible mechanism. Table 3 (Section 5.1) applies this three-level evidentiary hierarchy to each principal claim of the article. Because the documentation of the flagship project is classified, smoking-gun and

doubly decisive evidence are unavailable for the claims that concern motivation; the hierarchy therefore records which interpretations survive hoop tests and which are merely corroborated, not which are confirmed.

3.4. Descriptive data and counterfactual benchmarks

Descriptive quantitative analysis covers investment magnitudes, financing terms, traffic, and FDI flows compiled from official statistics, project communications, and the peer-reviewed literature cited throughout, with all monetary figures reported as documented ranges where sources differ, and with net and gross figures distinguished where the source allows. We triangulate our interpretations against the secondary scholarship on each embedded case [7,8,46]. For the qualitative counterfactual in Section 4.4, we benchmark the documented cost of the flagship railway against unit costs of alternative uses drawn from completed Hungarian projects of the same period (conventional line modernization, expressway construction, suburban rail renewal) and against programme envelopes (the 2014–2020 EU transport operational programme, the 2021 Budapest agglomeration railway strategy, and the railway company's annual renewal budget). These benchmarks are indicative orders of magnitude, not appraisals: they are not adjusted for inflation across years and do not model benefits.

3.5. Temporal scope and limitations

Three limitations shape the evidentiary basis and are revisited in Section 6. First, the core financing and engineering documentation of the Budapest–Belgrade project was classified for ten years by a 2020 act of parliament; loan terms and cost structures must therefore be reconstructed from official announcements, parliamentary answers, and secondary analyses rather than primary contracts. Second, the study window closes with the end of the construction phase and political cycle in spring 2026. It therefore permits a complete reconstruction of investment decisions and the financing architecture, but not an ex-post appraisal of realized demand and economic performance: freight operation on the Hungarian railway section began in February 2026, passenger operation had not begun at the time of writing, and the anchor battery investments were only entering production. Accordingly, references to outcomes concern the construction, cost, and financing record rather than traffic or welfare effects. Developments after the change of government in May 2026, including the announced review of flagship projects, fall outside the study window and are noted only as directions for future research. Third, the single-country design supports identification of the configuration and its evidentiary status, but not causal estimation; in particular, it cannot isolate the contribution of corridor investment to FDI location from subsidies, market access, the existing industrial base, or labour-market conditions.

4. Results

4.1. The Budapest–Belgrade railway: sovereign credit and the price of hub positioning

The reconstruction of the roughly 350-kilometre Budapest–Belgrade line is the empirical anchor of the case. Announced at the 2013 Bucharest China–CEE summit within weeks of the BRI's proclamation and framed at the 2014 Belgrade summit as the northern land segment of the China–Europe Land–Sea Express Route linking the Chinese-operated port of Piraeus to Central Europe (S1: A01–A02), the project was presented from the outset not as a response to bilateral passenger or freight demand, which had historically justified only a modest conventional service, but as a transit and hub asset [7]. The sequence of commitments on the Hungarian side is fully documented: the bilateral intergovernmental agreement on the development, construction, and financing of the Hungarian section was signed in November 2015 and promulgated

by Act XXIV of 2016, with its financing annex promulgated by Act XXXV of 2017 (S1: A03–A04); the construction contract for the approximately 150–160-kilometre Soroksár–Kelebia section, to be upgraded to a double-track, electrified, 160 km/h line equipped with ETCS Level 2 (S1: A11), was awarded in June 2019 to a consortium comprising two Chinese state-owned railway companies and a Hungarian partner firm, at a reported value of about HUF 590 billion (S1: A07); the loan agreement with the Export–Import Bank of China was announced in April 2020 for USD 1.855 billion at a fixed 2.5 per cent rate over twenty years, with a five-year grace period, covering 85 per cent of costs and leaving the remainder to the national budget (S1: A08) [8]; construction began in October 2021 (S1: A12). On the Serbian side, Belgrade–Novi Sad opened in March 2022, while the Novi Sad–Subotica–Kelebija section opened only in October 2025, after the November 2024 collapse of the renovated Novi Sad station canopy delayed commissioning (S1: A16, A23–A24). On the Hungarian section, freight operation began on 27 February 2026, whereas passenger operation was still awaiting certification of the train control system at the close of the study window (S1: A18–A20).

Three features of the project bear directly on the framework. First, cost escalation and appraisal weakness: the Hungarian section, initially communicated in 2015 at around HUF 472 billion (S1: A26), was estimated at HUF 750 billion by May 2017 (S1: A27) and, in a parliamentary answer of December 2017, at HUF 949 billion including financing costs (S1: A05); specialist press coverage in 2026 placed the figure at about HUF 1000 billion (S1: A19). Independent estimates circulated in the public debate placed the investment's payback period, under the corridor's own traffic projections, at several centuries to more than two millennia (S1: A13). No full cost–benefit analysis was ever published: the feasibility study was withdrawn from public access in December 2017 (S1: A06), a pattern associated in the megaproject literature with strategic misrepresentation [2,3]. Second, information restriction: a dedicated 2020 statute classified the contract and decision-support documentation for ten years, citing foreign-policy and economic interests (S1: A09–A10) [8]. Third, multi-scalar coalition building: as Szabó and Jelinek [8] demonstrate, the project brought together Chinese state capital seeking a European reference project, a national government seeking connectivity-based differentiation, and domestic contractors seeking large-scale construction opportunities—a coalition in which conventional transport-economic criteria had no institutional advocate. The early operational record is consistent with this appraisal weakness: before reconstruction, the border section carried roughly ten to twelve train pairs per day in total traffic, and Hungarian–Serbian rail freight declined by more than two-fifths between 2019 and 2023 while road freight grew (S1: A22); in April 2026, the rebuilt Hungarian section carried an average of about six freight trains per day, with a peak of fourteen, and no passenger service (S1: A19). The two figures are not directly comparable; we therefore report them as early indicators rather than as an outcome evaluation, for the reasons given in Section 3.5.

Interpreted through our framework, the railway is best understood as a purchase of hub optionality. Hungarian policy accepted fiscal exposure, opacity, and a weak stand-alone business case in exchange for three network-strategic assets: a credible claim to be the EU terminus of the Land–Sea Express Route; a demonstration of partnership reliability towards its principal external lender at a time when comparable projects elsewhere in the EU were being scaled back; and an enhanced bargaining position between competing connectivity-financing regimes. The evidentiary status of this interpretation is as follows. Hub positioning as a stated objective is documented: it appears in the 2014 multilateral guidelines, the 2015 agreement and its promulgating act, the railway company's project description, and ministerial statements through 2025, both before and after commitment and across Chinese, domestic, and EU audiences; it was also accompanied by the costliest commitments a government can make (statutory promulgation, a sovereign loan, and a classification act) (S1: A02–A03, A09, A11, A15, A17). By the criteria of Section 3.3, the strategic objective therefore survives the hoop test;

because the documentation is classified, no smoking-gun evidence is available, so the interpretation is retained rather than confirmed. That the objective was pursued at the expense of appraisal is likewise documented. What is not documented, and cannot be established from classified contracts, is whether decision-makers believed the option to be worth its price: the absence of a published appraisal is equally consistent with a strategy whose economics were never examined and one whose economics were examined and suppressed. Whether the option acquires value depends on corridor traffic that is itself endogenous to wider transit-market conditions, including the post-2022 reorganization of Eurasian rail flows and the growth of trans-Caspian routings; on Piraeus throughput, which fell by almost eight per cent in 2024 (S1: A21); and on complementary investments south of Belgrade towards North Macedonia and Greece that remain incomplete.

4.2. Corridors as coupling devices: BRI logistics and the electric-vehicle investment wave

The second embedded case connects transport strategy to industrial outcomes and is the case in which the distinction between documented intent, strategic complementarity, and causal effect matters most. Between 2016 and 2025, Hungary became the principal European destination for Asian battery and electric-vehicle manufacturing FDI: Samsung SDI at Göd (from 2016), SK On at Komárom (2018–2019) and Ivánca (2021), the CATL gigafactory at Debrecen, announced in 2022 at approximately EUR 7.3 billion and 100 GWh capacity; the BYD passenger-vehicle plant at Szeged, announced in December 2023 as the first such Chinese plant in the EU; and a set of cell and cathode-material plants at Nyíregyháza, Ács, and Debrecen announced in 2023, alongside the BMW plant at Debrecen, which opened in 2025 (S1: B08–B13, B16, B20) [45,46]. The investment promotion agency reported annual FDI inflows of EUR 10.3 billion in 2024, of which automotive and electronics accounted for almost four-fifths, and cumulative battery-related investment of about EUR 24 billion since 2016 (S1: B04–B05). The MERICS–Rhodium series records Hungary as receiving 44 per cent of all Chinese FDI in Europe in 2023 and roughly a third in 2024 (S1: B06–B07). Analyses of Chinese FDI in Europe identify logistics endowments, EU market access, and aggressive state subsidies as decisive locational factors [11,23,36], while the government confirmed in April 2025 that public support to battery plants had reached about HUF 1500 billion (S1: B14), including publicly financed infrastructure for the Debrecen economic zone (S1: B15).

We organize the evidence on the corridor–FDI link by evidentiary level. At the level of documented intent, the 2022 National Battery Industry Strategy 2030 sets the objective of making Hungary one of the hubs of the European battery value chain and lists easy access to international logistics routes among the locational criteria for gigafactory investment, but it names no specific corridor or railway project (S1: B03); the 2016 Irinyi Plan contains general logistics language only (S1: B02); and interview-based evidence records that multimodal accessibility at Debrecen, including motorway, rail, and air connections, and transcontinental linkages including the Budapest–Belgrade line, featured in corporate location decisions [11]. Documented intent therefore extends to a generic logistics-access criterion and to investor statements, not to a documented decision rule linking specific corridors to specific plants. At the level of inference from sequence, the corridor decisions predate the plant announcements, and the plants are spatially concentrated on the corridor axes shown in Fig. 1: Debrecen on the Košice–Oradea axis of the Baltic Sea–Black Sea–Aegean Sea corridor, Szeged at the junction of the Rhine–Danube road axis and the Budapest–Belgrade line, Göd, Komárom, and Ács on the Rhine–Danube axis, Ivánca on the M6 axis towards Croatia, and Nyíregyháza on the Mediterranean corridor towards Záhony. Sequence and co-location establish strategic complementarity. At the level of plausible mechanism, the strategic coupling framework [13,15] predicts that corridor and terminal capacity functioned as the state's contribution to coupling Asian

battery producers with the German-led automotive complex already embedded in the country's integrated-periphery profile [43–45]. We do not claim, and the evidence cannot show, that corridor investment generated or materially caused the FDI wave: EU market access, investment subsidies of the magnitude just cited, the existing automotive production base, labour-market conditions, energy pricing, and industrial policy are all candidate explanations that our design cannot separate from logistics accessibility, and the sectoral literature assigns subsidies and market access the leading roles [22,23]. The defensible claim is that corridor development and FDI attraction were pursued as complementary elements of one strategy, and that accessibility is a plausible, partially documented contributor to plant location.

Two qualifications from the record are essential to an evenhanded assessment. First, the strategy's social licence proved fragile: the Debrecen conflict over water, energy, and environmental risk revealed sustained local debate over environmental and resource impacts [46]. Second, execution risk migrated from the state to the corporate side after 2024, as battery demand softened and flagship investors slowed construction phases and initial capacity utilization: at the close of the study window the CATL plant had begun module assembly but not cell production, the BYD plant had begun trial but not series production, and workforce reductions had been reported at Ivánca (S1: B08–B10), exposing the concentration risk inherent in coupling national infrastructure strategy to a single technological trajectory [22,45].

4.3. Building outwards: EU-co-financed and nationally financed corridors and cross-border network development

The third embedded case concerns the far larger component of the programme, the extension of the motorway and railway network towards national borders. Hungary lay on the Orient/East-Mediterranean, Rhine–Danube, and Mediterranean core network corridors of the 2013 trans-European transport network framework and, since the 2024 revision (Regulation (EU) 2024/1679), lies on four European Transport Corridors: Rhine–Danube and Mediterranean, together with the Western Balkans–Eastern Mediterranean corridor, which links Budapest to Belgrade and to Osijek, and the Baltic Sea–Black Sea–Aegean Sea corridor, which links Košice to Debrecen and Oradea along the Via Carpatia alignment (S1: C01–C04). The revision thus consolidated the corridor architecture and extended it towards the Western Balkans, Ukraine, and Moldova, raising the strategic weight of exactly the axes on which Hungary sits. Within this framework, the distinguishing feature of Hungarian network development after 2010 was its systematic orientation towards national borders (Fig. 1; Table 2): completion of the M43 motorway to the Romanian border at Csanádpalota (2015) and of the M4 to the Romanian border at Nagykeréki (2020); the M30 expressway from Miskolc to the Slovak border at Tornyosnémeti on the Via Carpatia alignment (2021); the M85 to Sopron and, through a tunnel, to the Austrian border (2020 and 2024); the M44 expressway across the south-eastern plain to Békéscsaba (2019–2025); the M6 to the Croatian border at Ivándárda (2024, connected to the Croatian network in 2025); the M49 towards the Romanian border at Csenger (under construction); the development of the Záhony wide-gauge transshipment zone at the Ukrainian border, including a privately financed intermodal terminal opened in 2022 (S1: B17–B18); and the Budapest–Belgrade line itself towards northern Serbia. The expressway network grew by roughly 600–700 km between 2010 and 2022, from about 1100 km to more than 1800 km on the ministry's series (S1: C29–C30); the statistical office's series, which reclassified part of the category in 2016, records 1477 km in 2010 and 1871 km in 2023 (S1: C28).

The financing record requires a qualification that is easily overlooked: the border extensions were not uniformly EU-co-financed. The M43, the M4 Berettyóújfalu–Nagykeréki section, and the M30 were financed through the 2007–2013 and 2014–2020 EU transport operational programmes with 85 per cent EU co-financing (S1: C10–C13, C19–C20), whereas the M44, the M85 including its tunnel, the later M4

sections, the M6 border section, and the M49 were financed almost entirely from the national budget (S1: C14–C18, C22–C27). The M44 and the inner M4 sections were nationally financed from the outset, and from 2020 onwards every newly opened border-oriented section was on the national-budget channel. This pattern coincided with the exhaustion of the 2014–2020 envelope, with the pre-financing of projects ahead of the 2021–2027 programme, whose HUF 1500 billion allocation was decided only in March 2024 (S1: C06), and, from December 2022, with the Council's suspension of 55 per cent of budgetary commitments under three cohesion operational programmes, including the transport programme itself, under the conditionality regulation (S1: C07). The border-oriented programme therefore ran on two of the three channels of the financing architecture, and the third, bilateral sovereign credit, was used for one project only. Regional evidence indicates that CEE investments extending networks towards outer boundaries have been comparatively favourable for accessibility and development outcomes [9], even as EU-level analysis cautions that high-speed upgrades are justified only on corridors with sufficient demand density [32], and CEE evidence highlights the uncertainty of modal-shift responses to new rail capacity [51,52].

The territorial pattern is thus concentric and outward-facing: a network geometry that shortens economic distance between Budapest and the surrounding cross-border regions. Planning documents framed these projects in terms of macroregional economic integration before they were built: the 2014 National Development and Territorial Development Concept and the 2014 National Transport Infrastructure Development Strategy both assign priority to cross-border connections and to the Carpathian Basin as an economic space (S1: C08–C09), and the completion communications for each section state the border connection as its purpose (S1: C11, C13, C21, C24). The record documents an economic-integration programme operating through EU-compatible instruments, market access, connectivity, and investment, whose full traffic potential presupposes the future enlargement of the EU and of the Schengen area towards the Western Balkans.

The same record must, however, be read against the political-economy expectations of Section 2.5. At the regional level the two interpretations are observationally equivalent: the eastern and southern regions that received the largest share of new capacity are simultaneously the least developed regions in cohesion-policy terms, the regions whose TEN-T alignments the EU regime rewards, and the rural peripheries that constitute the government's electoral core [25]. Four finer-grained observations discriminate partially. First, termination points: every border-oriented extension in Table 2 (M43, M4 Berettyóújfalu–Nagykeréki, M30, M6, M85, M49) was carried to the border crossing itself, including terminal segments beyond the last significant domestic node that serve thin domestic demand (the 23 km from Makó to Csanádpalota, the 26.5 km from Berettyóújfalu to Nagykeréki, the 56.6 km from Miskolc to Tornyosnémeti, the 20 km from Bóly to Ivándárda, and the 4 km tunnel at Sopron), while the M44 and the inner M4 sections are feeder axes towards the same borders. Four of the six road border termini, and the railway, lie on designated European Transport Corridor alignments; the M85 and the M49 connect to neighbouring national networks outside the designations. The distributive literature predicts that discretionary spending is targeted where its electoral yield is highest, that is, at populated settlements [24,26], which for a road programme implies termination at the last populated domestic node rather than in a sparsely populated border strip. The observed geometry is what the connectivity interpretation predicts. The test has a limitation: for EU-co-financed sections the border connection may be compelled by the financing regime, which ties cohesion support to the trans-European network. The nationally financed border sections (M6, M85 including its tunnel, M49) were subject to no such requirement and were nevertheless carried to the border, which is the discriminating observation. Second, direction: extensions were built towards the western border as well as the eastern ones, including the M85 to Austria and the M6 to Croatia, so the pattern is not confined to

the electoral core. Third, the Budapest agglomeration: the suburban network with the highest demand density in the country, centred on the region that constitutes the principal opposition stronghold [25], received a strategy in 2021 whose first decade is costed at about HUF 1000 billion but whose funding was decided only in March 2024, while a comparable sum was committed to the flagship transit line (S1: C06, C35; Table 4). This is consistent with the under-investment in opposition areas that the distributive interpretation predicts; it is also consistent with the limited cohesion eligibility of the more developed Central Hungary region in 2014–2020, and the two cannot be separated with our data. Fourth, timing and procurement: openings cluster in 2019–2021 and 2024–2025, immediately before the 2022 and 2026 elections, which is consistent with electoral-cycle timing but equally with the closure of the 2014–2020 programme period; and contract awards on the nationally financed track were concentrated among a small number of domestic contractors, a pattern the procurement literature associates with reduced competition and political connection [27, 28]. We do not evaluate individual awards. The reading the record supports is that domestic political economy shaped who built the network, plausibly when, and possibly what was left unbuilt, while corridor designations shaped where the border-oriented programme terminated; Section 5.2 draws the implications of this mixed finding. The analytical point stands that corridor geometry encoded a macroregional connectivity objective that standard national appraisal frameworks neither capture nor evaluate, but it now stands alongside, not instead of, the distributive channel.

4.4. The opportunity cost of the flagship: a qualitative counterfactual

The Budapest–Belgrade railway absorbed resources that could have been used elsewhere in the Hungarian transport system, and the magnitude of that opportunity cost can be gauged even though the classified documentation precludes a formal appraisal. Table 4 benchmarks the documented cost of the Hungarian section on two bases, a construction basis of HUF 590–750 billion (the 2019 contract value and the 2017 pre-contract estimate) and a full-cost basis of HUF 949 billion including financing costs on the 2017 official figure, against the unit costs and programme envelopes documented in Supplementary Material S1. Three comparisons stand out. First, the flagship cost between about half and three-quarters of the entire 2014–2020 EU transport operational programme for Hungary, which had a total envelope of EUR 3.92 billion, or roughly HUF 1200–1300 billion at the exchange rates of the years in which it was contracted (S1: C05), and between two-thirds and the whole of the first decade of the 2021 Budapest agglomeration railway strategy, costed at approximately HUF 1000 billion to 2030 for the suburban network with the highest demand density in the country (S1: C35). Second, at the unit costs of completed conventional line modernizations of the same period, HUF 2.4–3.0 billion per kilometre for upgrading double-track lines to 120–160 km/h with modern signalling (S1: C31–C33), the same sum would have modernized roughly 200–300 kilometres of the existing network on the construction basis and 300–400 kilometres on the full-cost basis, which is the order of magnitude of the main-line backlog on the Budapest–Debrecen–Nyíregyháza, Budapest–Pécs, and Balaton axes within a network of about 7400 kilometres (S1: C40), or would have covered the railway company's annual track renewal budget, HUF 20–23 billion, for between two and a half and four decades (S1: C37–C38). Third, at the unit costs of the standard inter-urban expressway sections in Table 2, HUF 2.4–3.6 billion per kilometre for the M44, M85, M30, and M4 border sections, the same sum would have built roughly 160–310 kilometres of expressway on the construction basis and 260–400 kilometres on the full-cost basis; at the higher unit costs of the most recent border sections, HUF 4.5–8.1 billion per kilometre for the M6 and M49, the equivalents fall to roughly 70–170 and 120–210 kilometres (S1: C10–C27). Either range covers the road connections to industrial zones and the missing east–west links that regional accessibility studies prioritize [9]. The benchmarks are

nominal: deflating the 2015–2020 unit costs to 2024 prices, after construction-price inflation of roughly one-half in Hungary between 2020 and 2024, would raise them and reduce the equivalents proportionally without changing their order of magnitude.

The likely impacts of these alternatives can be characterized qualitatively. Conventional line modernization on the busiest domestic axes and suburban rail renewal serve existing, measured demand and would have generated user benefits through travel-time savings and reliability, precisely the benefits that the accessibility-based upgrade methodology identifies where demand density is sufficient [32]; the regional evidence for CEE indicates that accessibility gains translate into development effects most strongly where networks are still being completed [9], which describes Hungary's domestic main lines better than its transit corridor. Modal-shift responses would have remained uncertain [51,52], but the counterfactual projects would have had positive appraisal records, which the flagship did not. By contrast, the flagship's benefits depend on transit traffic that had, at the close of the window, not materialized, and whose generation depends on decisions taken outside Hungary (Section 4.1). The comparison therefore strengthens the interpretation that the project was optimized for strategic positioning rather than for transport-economic returns, and it quantifies, in orders of magnitude, what was foregone: an amount comparable to between half and three-quarters of an EU programme period of transport investment, spent on the corridor in the portfolio with the weakest documented demand. It also illustrates the fragility mechanism identified at the macroeconomic scale [30]: the debt service on the sovereign loan is fixed, whereas the benefits are contingent.

5. Discussion

5.1. The small-state corridor strategy: assessing the framework

The evidence is consistent with all four expectations of the framework and eliminates none of them; however, their evidentiary status differs, as Table 3 makes explicit. Because smoking-gun evidence is unavailable while the flagship's documentation remains classified, the expectations are retained and corroborated rather than confirmed. The objective function of Hungarian transport policy demonstrably extended beyond appraised user benefits to hub positioning and, as a stated complementary objective, FDI attraction (Sections 4.1 and 4.2). The hub-positioning objective is documented; the FDI-coupling objective is documented at the level of generic logistics-access criteria and, beyond that, inferred from sequence and co-location. The financing architecture operated through three parallel channels and allocated projects among them at the portfolio level: the one project that EU funds would not have financed on the basis of its appraisal record was placed on the bilateral sovereign-credit track from the outset; the border-oriented road programme ran on the EU track and, from 2020, exclusively on the national-budget track; and no project combined bilateral credit with either of the other channels. The mechanism is therefore portfolio-level diversification combined with a single, decisive instance of regime allocation; project-level co-financing occurred only in the routine form of national co-financing for EU-supported projects. The allocation itself is documented; the motive for placing the flagship on the bilateral track remains a plausible mechanism rather than a documented fact: the EU channel would have required a published appraisal and open procurement that the project's record could not satisfy, while the Commission's 2016 inquiry showed that EU procurement discipline extended even to a bilaterally financed project (S1: A14). Describing the architecture as a pooling of EU and Chinese resources would therefore misstate the record. Governance costs materialized as predicted through restricted disclosure, contested procurement, and cost escalation on the bilateral track and, in attenuated form, through reduced procurement competition on the national-budget track, while the EU-financed track remained within, though at times in tension with, Union procurement and cohesion rules. The territorial pattern is concentric and border-oriented, with

termini aligned with European corridor designations. Hungary thus offers a demand-side, national-scale complement to programme-level assessments of transnational corridor initiatives [1,31]: small states along international corridors are not passive terrain but active arbitrageurs between financing regimes, converting locational position into economic advantage—or at least into the option of doing so.

The case also refines the debate on Chinese infrastructure finance in Europe. The Hungarian record fits neither a debt-trap narrative (the loan is modest relative to GDP and was actively sought [33]) nor an unproblematic connectivity narrative, given the documented opacity and the absence of a published business case. It is better captured as a negotiated exchange in which the borrowing state obtained financing and hub positioning, and the lending side obtained a standards-compliant European reference project for its railway industry [31,34]. That exchange, however, embedded an asymmetry: Hungary bears the fiscal and reputational risk domestically and within the EU, while the corridor's traffic value depends on decisions taken elsewhere (Piraeus throughput, Serbian and North Macedonian upgrades, Eurasian routing shifts) [37].

5.2. Strategic coherence or fragmented politics? Adjudicating the rival interpretations

The central question for any strategic interpretation of the Hungarian record is whether the observed pattern reflects a single, ex-ante formulated, coherent strategy or a series of fragmented, politically driven decisions that were retrospectively rationalized as a strategy. It is not sufficient to assert that neither reading alone explains the configuration; the process-tracing record allows a more precise answer, and it is a mixed one. We treat the fragmented-politics interpretation as a bundle of separable predictions, so that a failed hoop test eliminates the prediction it concerns, not the bundle.

Four findings favour the strategic interpretation over the fragmented-politics interpretation. First, temporal precedence: the connectivity objective is documented before the commitments it explains. The Eastern Opening was articulated in the 2011 foreign economic strategy, before the BRI existed; the transit-hub rationale for the railway was stated in the 2014 multilateral guidelines and in the 2015 agreement, before the 2019 contract and the 2020 loan; and the cross-border priority of the road programme was stated in the 2014 development concept and transport strategy, before most of the sections in Table 2 were contracted (S1: A02–A03, B01, C08–C09). Prediction (a) of the fragmented-politics interpretation, that connectivity language postdates commitment, fails. Second, costly commitment: the strategy was backed by acts that cheap talk does not produce, namely two promulgating statutes, a twenty-year sovereign loan, a classification act adopted at a political cost, and sustained budget allocations to nationally financed border sections after EU funds became constrained. Third, cross-audience and cross-project consistency: the same objective was stated to Chinese, EU, and domestic audiences across sixteen years, and the geometry of the road programme, with border termini rather than domestic termini, is consistent with it across the eight road projects and the railway in Table 2, financed through three different channels. Prediction (e), internal inconsistency, fails, and prediction (b) fails on termination points, most clearly for the nationally financed border sections that no EU rule required to reach the border. Fourth, the continuity of the governing coalition means that the fragmentation hypothesis must locate fragmentation within one administration; the record instead shows one administration pursuing one stated objective through two financing regimes for sixteen years.

Three findings favour the fragmented-politics interpretation and must be retained. Contractor concentration on the nationally financed track and on the flagship is consistent with prediction (d), and the peer-reviewed literature on Hungarian public procurement gives that consistency weight [26–28]. Opening dates clustered before elections are consistent with prediction (c), although not uniquely so. The late

funding of the Budapest agglomeration railway strategy relative to the flagship is consistent with the under-investment component of prediction (b), although cohesion eligibility offers an alternative explanation. Distributive politics therefore explains part of the how and the when of the programme, and possibly part of what was not built.

The two interpretations are compatible, and the megaproject literature explains why. Strategic misrepresentation, in Flyvbjerg's sense, concerns the justification of a project's economics, not the sincerity of its objective [3]: a government can hold a coherent strategic objective and misrepresent, or refuse to examine, the economics of the projects that serve it. That is what the Hungarian record displays. The strategic objective is documented by every criterion of Section 3.3; the economic case for the flagship was never published and was probably never favourable; and the distributive channel operated within the strategy rather than instead of it. Our claim is accordingly narrower than a strong strategic reading would be: not that Hungarian transport policy was a strategy validated by its results, but that it was a coherent connectivity strategy whose economics were unpriced and whose implementation was shaped by domestic political economy. The strategic interpretation is more compelling than the fragmented-politics interpretation as an account of project selection and border-oriented geometry; the fragmented-politics interpretation is more compelling as an account of contracting, timing, and the ordering of unfunded priorities; and neither should be read as an account of outcomes, which the study window does not reach.

5.3. Implications for transport economics and management

Three implications follow for the discipline and for practice. First, appraisal: strategically motivated projects will not disappear because cost–benefit analysis disapproves of them; the constructive response is to make their strategic premium explicit and contestable. Appraisal frameworks should require an options-and-influence account (what optionality is being purchased, from whom, and at what fiscal exposure) alongside conventional demand analysis, so that legislatures can price the strategy rather than discover it ex post; recent methodological advances in the ex-post assessment of infrastructure investment impacts make such accounting increasingly tractable [5], and corridor-level welfare analysis demonstrates that measures justified in the aggregate can fail on specific corridors, reinforcing the case for project-by-project transparency [6]. The counterfactual in Section 4.4 shows what such an account would have had to disclose: the option was purchased at a cost equivalent to between half and three-quarters of a programme period's worth of appraised domestic investment. The Hungarian classification statute represents the opposite pole: strategy priced by no one. Second, financing governance: parallel-channel architectures create regulatory arbitrage among EU, national, and bilateral regimes, and the three mechanisms distinguished in Section 2.5 require different responses. Portfolio-level diversification is legitimate and unavoidable; regime allocation—the placement of a project in the channel whose appraisal requirements it can satisfy—is the mechanism that appraisal governance must target; project-level co-financing across the bilateral and EU regimes, which did not occur here, would instead raise questions of state-aid and procurement compatibility. The 2024 TEN-T revision's tightening of corridor governance, and EU instruments on foreign subsidies and investment screening, move in the direction indicated by this case, but the railway demonstrates that member states retain wide discretion to relocate projects to the less disciplined track, and the post-2020 shift of road projects to the national budget shows that the domestic track can absorb projects when the EU track is constrained. Because implementation risk in regional railway investment is itself substantial and measurable [29], disclosure of financing terms and risk allocations is a precondition of meaningful appraisal, and comprehensive evaluation frameworks that go beyond conventional cost–benefit analysis provide the appropriate template [4]. Third, management of coupled infrastructure–industrial strategies: where corridors are built to

attract strategically coupled FDI, project risk becomes correlated with a single industrial trajectory, here electromobility, and with the social licence of anchor investors [46]. Portfolio thinking, staging of capacity, and binding local-benefit arrangements are the appropriate management responses; their absence in the Hungarian case amplified both fiscal and financial exposure [22,45].

5.4. Alternative interpretations and evenhandedness

Two further interpretations of the evidence deserve consideration alongside the fragmented-politics interpretation adjudicated in Section 5.2. A benign-modernization interpretation holds that Hungary rationally exploited cheap external capital to compress a century-old infrastructure gap, and that criticisms of individual project economics understate network and option value; the favourable regional evidence on outward network extension lends this view partial support [9], and the counterfactual in Section 4.4 does not refute it for the road programme, whose sections serve documented cross-border demand. The interpretation is weakest for the flagship, whose option value was never priced and whose early freight traffic has not yet reached the pre-reconstruction level of total traffic. An institutional interpretation holds that corridor policy primarily reflected domestic distributive and administrative dynamics, and that connectivity language partly served communicative purposes, a pattern familiar from the megaproject literature on strategic misrepresentation [3]; Section 5.2 has shown that this interpretation captures the contracting and timing of the programme, but not its geometry or sequence. Our account incorporates elements of both (option value is real but was never priced; distributive effects are real but accompanied a genuine reorientation documented in FDI data [11,36]), while we insist that neither alone explains the specific configuration of financing, restricted disclosure, and border-oriented geometry that the record displays. The completion of the construction phase in 2026 creates the conditions for ex-post evaluation of railway traffic, battery-sector outcomes, and cross-border connectivity effects—an evaluation that our framework makes tractable but that this article does not undertake.

6. Conclusions

In this article, we have reconstructed Hungarian transport infrastructure policy between 2010 and 2026 as a coherent small-state corridor strategy: the allocation of corridor projects across parallel financing channels—EU cohesion and CEF grants, the national budget, and external sovereign credit—to build a concentric, border-oriented corridor system whose expected returns were network-strategic (hub positioning between Eurasian and European circuits, the coupling of electric-vehicle manufacturing capital to the domestic automotive complex, and closer cross-border connectivity within the surrounding macroregion) rather than narrowly transport-economic. The Budapest–Belgrade railway exemplifies the model's costs—fiscal exposure, opacity, appraisal failure, and an opportunity cost comparable to between half and three-quarters of an EU programme period of appraised domestic investment—while the FDI record exemplifies its intended returns and their fragility. We have shown that the strategic objective is documented through temporal precedence, costly commitment, and cross-audience consistency; that the corridor–FDI relationship reflects documented complementarity rather than demonstrated causation; and that domestic political economy shaped the contracting and timing of the programme within, rather than instead of, the strategy.

Our contributions are conceptual, empirical, and practical. Conceptually, we extend the transport economics literature on corridor investment to the demand side of externally financed corridor development, differentiate the small-state corridor strategy from strategic coupling, infrastructure-led development, corridor governance, hub positioning, and network option value, and specify four dimensions with observable implications that can be tested beyond Hungary.

Empirically, we provide the first integrated, source-critical account linking the flagship railway, the corridor-linked FDI wave, and border-oriented network development through early 2026, supported by a project and financing matrix, a corridor map, a structured documentary corpus, and an explicit evidentiary hierarchy. Practically, we derive appraisal, financing-governance, and management criteria for the growing class of infrastructure projects whose rationale is strategic.

The evidentiary situation imposes several limitations. Classified contract documentation constrains the precision of the financing analysis; the study window closes with the construction phase, so the railway's operational performance, the battery plants' production outcomes, and the cross-border connectivity effects of the road programme cannot yet be evaluated and are therefore not assessed here; and the single-country design limits generalization and precludes causal estimation of the corridor–FDI link. Future research should, first, conduct an ex-post appraisal of the Budapest–Belgrade corridor once sufficient traffic data have accumulated, using the early operational indicators reported in Section 4.1 as a baseline; second, compare Hungary with other corridor arbitrageurs (Serbia, Greece, and, in the trans-Caspian context, Kazakhstan and Azerbaijan) to test the four dimensions comparatively; and third, examine how the policy review announced after the 2026 change of government and the evolving TEN-T framework reprise the connectivity options acquired during the period studied here, providing a setting that approximates a natural experiment on the durability of strategically motivated infrastructure commitments. For transport economics and management, the broader lesson is that the discipline's appraisal toolkit must learn to make strategy visible, because states across the world have relearned how to make infrastructure strategic.

CRedit authorship contribution statement

Brigitta Zsótér: Writing – review & editing, Validation, Supervision, Conceptualization. **Gábor Dániel Nagy:** Writing – review & editing, Writing – original draft, Methodology, Investigation, Conceptualization.

Declaration of Generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used large language model-based assistants (Claude, Anthropic; ChatGPT, OpenAI) to support the literature search, verify references, and refine Fig. 1. After using these tools/services, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

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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.

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Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at [doi:10.1016/j.team.2026.09.008](https://doi.org/10.1016/j.team.2026.09.008).

Data availability

Publicly available official documents, legislation, statistics and published literature were analysed; no new datasets were generated. Full document list in Supplementary Material S1.

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