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BEYOND REPUTATION-BASED RANKINGS: A HYBRID NETWORK FRAMEWORK FOR ASSESSING THE FUNCTIONAL CONNECTIVITY OF INTERNATIONAL FINANCIAL CENTRES

The article develops a framework for comparing the reputational visibility of international financial centres with their functional position in cross-border networks. It distinguishes competitiveness, professional recognition, and flow-based connectivity. The GFCI connectivity profile is interpreted as an indicator of geographical recognition rather than a direct measure of financial flows. A multilayer model is proposed for banking, investment, corporate ownership, payment, and infrastructural relationships. Node strength, closeness, and betweenness identify source, recipient, accessibility, and intermediary functions. The resulting two-dimensional framework distinguishes integrated global, reputation-dominant, under-recognised functional, and peripheral centres without combining heterogeneous measures into one score.

Keywords: international financial centres, financial networks, functional connectivity, reputational visibility, network centrality, cross-border financial flows, GFCI.

JEL Classification: G15, F36, D85.

ЗА МЕЖАМИ РЕПУТАЦІЙНИХ РЕЙТИНГІВ: ГІБРИДНА МЕРЕЖЕВА МОДЕЛЬ ОЦІНЮВАННЯ ФУНКЦІОНАЛЬНОЇ ПОВ'ЯЗАНОСТІ МІЖНАРОДНИХ ФІНАНСОВИХ ЦЕНТРІВ

У статті розроблено методичний підхід до зіставлення репутаційної видимості міжнародних фінансових центрів із їхнім функціональним положенням у транскордонних фінансових мережах. Обґрунтовано необхідність розмежування трьох взаємопов'язаних, але не тотожних характеристик: конкурентоспроможності, що відображає інституційні, економічні, інфраструктурні та кадрові умови фінансової діяльності; репутаційної видимості, яка характеризує широту міжнародного професійного визнання; функціональної мережевої пов'язаності, що визначається місцем центру в системі спостережуваних транскордонних відносин. Доведено, що профіль пов'язаності Глобального індексу фінансових центрів доцільно трактувати як показник географічного охоплення професійних оцінок, а не як безпосередній вимір двосторонніх фінансових потоків. Запропоновано представляти міжнародну фінансову систему у формі спрямованої зваженої багатоплощинної мережі, окремими шарами якої є банківські вимоги, інвестиційні позиції, корпоративна власність, платежі та зв'язки фінансової інфраструктури. Визначено, що поєднання різномірних відносин в одному показнику без належного теоретичного обґрунтування може приховувати економічні функції окремих центрів. Для оцінювання мережевого положення запропоновано використовувати вхідну та вихідну силу вузла, близькість і посередництво. На умовній матриці фінансових потоків показано, що ці показники ідентифікують різні ролі центру як джерела, одержувача, доступного вузла або посередника. Сформовано двовимірну

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діагностичну модель, яка дає змогу розрізняти інтегровані глобальні, репутаційно домінуючі, недостатньо визнані функціональні та периферійні фінансові центри. Запропонований підхід не формує універсального рейтингу, а виявляє відповідність або розбіжність між міжнародним визнанням і фактичним положенням центру в обраній фінансовій мережі. Модель має діагностичний характер і може застосовуватися для порівняння змін репутації та мережевого положення у часі. Практичне застосування потребує порівнянних двосторонніх даних і окремого оцінювання кожного мережевого шару.

Ключові слова: міжнародні фінансові центри, фінансові мережі, функціональна пов'язаність, репутаційна видимість, мережева центральність, транскордонні фінансові потоки, GFCI.

Problem Statement. International financial centres are commonly compared through composite rankings that combine economic, institutional, infrastructural, and reputational characteristics. These assessments help identify favourable conditions for financial activity and the international recognition of particular centres. However, they do not necessarily reveal how centres participate in cross-border financial relationships or what structural functions they perform in the movement, allocation, and intermediation of capital.

This distinction has become increasingly important as the global financial system has developed into a complex network of banking exposures, investment positions, corporate ownership links, payment channels, and financial infrastructure. A centre may be highly visible in international rankings but occupy a limited position in a particular flow network. Conversely, a less prominent centre may serve as an important source, recipient, intermediary, or operational node. Equating reputational prominence with functional connectivity may therefore produce incomplete conclusions about the actual role of a financial centre.

The research problem consists in the absence of a sufficiently integrated methodological framework for comparing professional recognition with observable network position. Such a framework must distinguish different forms of connectivity, account for the direction and intensity of relationships, and ensure that the selected centrality indicators correspond to the economic meaning of the underlying data. Addressing this problem requires combining reputational assessment with multilayer network analysis while preserving the analytical independence of both dimensions.

Analysis of Recent Research and Publications. Research on international financial centres has developed along several related but insufficiently integrated lines. The first examines the institutional and economic determinants of financial-centre competitiveness. Buitrago R. and Barbosa Camargo demonstrate that institutional quality affects international competitiveness by shaping transaction costs, market confidence, and conditions for capital allocation [1, pp. 423–435]. Solovjova, Rupeika-Apoga, and Romanova identify regulation, taxation, infrastructure, human capital, and financial-sector development as major determinants of the competitiveness of international financial centres [2, pp. 5–17]. These studies explain why financial activity is concentrated in particular jurisdictions but provide limited insight into the structure of relationships among financial centres.

A second research strand treats financial centres as nodes within cross-border networks. Wójcik, Knight, and Pažitka analyse international investment-banking activity and show that a city's position depends not only on the

scale of its domestic market but also on its participation in cross-border financial transactions [3, pp. 1–12]. This perspective shifts attention from the internal attributes of a centre to the flows connecting it with other locations. Hall complements this approach by demonstrating that the development of an international financial centre is embedded in territorial, political, and regulatory relationships that cannot be reduced to a general competitiveness score [4, pp. 489–502]. Michael also emphasises that political participation and institutional representation can influence the international position of a financial centre, although this influence may not be adequately reflected by conventional economic indicators [5, pp. 2–9].

Regional studies reveal additional heterogeneity in the functions performed by financial centres. Jarvis shows that competition among Asian financial centres is shaped by differences in state strategies, regulatory regimes, market specialisation, and integration into regional and global capital flows [6, pp. 60–95]. Lane and Milesi-Ferretti demonstrate that small international financial centres may intermediate cross-border assets and liabilities on a scale disproportionate to the size of their domestic economies [7, pp. 301–330]. Consequently, economic size, formal jurisdiction, and functional importance within the global financial system should be treated as related but distinct characteristics.

The Global Financial Centres Index represents the principal applied framework for comparing financial centres. Its methodology combines instrumental factors supplied by international organisations and other external providers with assessments collected through a professional questionnaire. GFCI 39 incorporated 147 instrumental factors and 34,468 assessments supplied by financial professionals [8, p. 4]. The index therefore should not be characterised as exclusively subjective. However, its general competitiveness rating and connectivity profile require conceptual differentiation. The latter primarily reflects the geographical breadth of external assessments and the extent to which a centre is recognised by respondents outside its home region. It is therefore informative as an indicator of international visibility and reputational reach but does not directly measure bilateral financial, corporate, or infrastructural flows between centres.

Network-based research provides instruments for examining such flows. Taylor conceptualises the world city system as a network in which cities are connected through the cross-border activities of advanced producer-service firms [9, pp. 181–194]. This approach establishes an important distinction between city attributes and intercity relations: the international role of a centre is determined not only by the resources located within it but also by its

position within a broader system of connections. Nevertheless, firm-location networks measure organisational presence and potential interaction rather than realised financial transactions.

García-Bernardo, Fichtner, Takes, and Heemskerk apply network analysis to corporate ownership relationships and distinguish jurisdictions that primarily retain foreign capital from those that channel it between other jurisdictions [10, pp. 1–10]. Their findings demonstrate that network position can reveal specialised intermediary functions that remain invisible in aggregate rankings. At the same time, corporate ownership, banking claims, investment flows, and payment transactions represent different forms of connectivity and cannot be combined without specifying the economic meaning, direction, and weight of each relationship.

The literature offers three complementary but generally separate perspectives: attribute-based competitiveness, perception-based international visibility, and relational analysis of cross-border connections. It does not provide an integrated framework for determining when a centre's reputational prominence corresponds to its functional network position and when the two diverge. Network results also depend on the selected data layer, definition of nodes and edges, transformation of financial values into distances, and centrality measure. The research gap therefore concerns the systematic comparison of reputational visibility and flow-based connectivity while preserving their analytical distinction.

Purpose of the Article. The purpose of the paper is to develop a methodological framework for comparing the reputational visibility of international financial centres with their functional position in cross-border financial networks. To achieve this purpose, the study clarifies the economic meaning of financial-centre connectivity; identifies the analytical limitations of interpreting the GFCI connectivity profile as a measure of actual network integration; determines the data layers and centrality metrics suitable for assessing financial, corporate, and infrastructural relationships; and proposes a two-dimensional model that reveals correspondence or divergence between a centre's perceived prominence and its flow-based network position.

Research Methods. A critical literature review method was used to systematise theoretical approaches to the competitiveness and connectivity of international financial centres and to identify the unresolved research problem. Document analysis was applied to examine the methodological materials of the Global Financial Centres Index and determine the analytical meaning and limitations of its connectivity profile. Comparative analysis was used to distinguish attribute-based competitiveness, perception-based reputational visibility, and flow-based functional connectivity. The classification method was employed to differentiate financial-network layers according to data type, economic meaning, direction of relationships, time dimension, and observability. Network analysis was used to represent financial centres as nodes and cross-border relationships as directed weighted edges, as well as to calculate incoming and outgoing node strength, outgoing closeness, and normalised betweenness using a hypothetical flow matrix.

Structural-functional analysis was applied to interpret the economic roles identified by the selected centrality indicators, including the roles of source, recipient, accessible node, and intermediary. Method of conceptual modelling and synthesis method were used to develop a two-dimensional diagnostic model comparing the reputational visibility of a financial centre with its functional network centrality.

Main Research Results. The competitiveness and connectivity of an international financial centre are related but distinct. Competitiveness reflects its capacity to attract institutions, investment, qualified professionals, and specialised services through regulation, institutional quality, infrastructure, market development, human capital, and business conditions. Connectivity describes its position within relationships linking institutions, firms, investors, markets, and jurisdictions.

A centre may offer favourable internal conditions without performing a significant intermediary function. Conversely, a small jurisdiction may occupy an important structural position by receiving, redirecting, or servicing financial flows exceeding its domestic economy. Competitiveness therefore concerns the attributes that make a centre attractive, whereas connectivity concerns the relationships through which it participates in the international financial system.

Early research on world cities associated their international importance with the concentration of advanced producer services. Beaverstock, Smith, and Taylor classified cities by the presence of leading banking, accountancy, advertising, and legal firms, replacing demographic classifications with a functional interpretation of international urban significance [11, pp. 445–458]. However, the presence of international firms indicates the capacity to support global operations rather than the volume and direction of realised relationships between centres.

A relational perspective shifts analysis from attributes within cities to connections among them. Alderson and Beckfield represent world cities as nodes linked through multinational corporate structures and demonstrate that network position reveals power and intermediary capacity not captured by city-level characteristics [12, pp. 811–851]. Connections of similar frequency may therefore differ in significance according to their direction, intensity, geographical distribution, and wider network position.

Three dimensions of a financial centre's international position should consequently be distinguished. Attribute-based competitiveness reflects the quality of its regulatory, economic, technological, and human-capital environment. Reputational visibility indicates how widely it is recognised by international market participants. Functional network connectivity reflects its observable position within cross-border financial, corporate, payment, and infrastructural relationships.

These dimensions may reinforce one another but are not interchangeable. Strong institutions and developed markets can attract international activity and improve reputation. Nevertheless, reputation may persist after financial relationships change, while specialised centres may perform important functions without equivalent recognition.

Perception-based rankings may overlook structural intermediaries; flow-based analysis may identify them without explaining their institutional and reputational foundations.

Functional network connectivity is defined here as the extent and structural significance of a centre's participation in measurable cross-border relationships. It is relational because it cannot be inferred from isolated characteristics; multidimensional because banking claims, investment positions, corporate ownership, payments, and infrastructural links represent different processes; and structural because a connection's significance depends on both its value and its position within the network.

A single connectivity score may therefore conceal different functions. Large outgoing flows may identify a source of capital, substantial incoming flows a destination or booking location, and a position between other nodes an intermediary or conduit. Numerous direct links do not necessarily imply integration into the network's most important segments. Separate indicators are thus required to preserve these distinctions.

This differentiation provides the basis for evaluating the GFCI connectivity profile. The profile measures international recognition and the geographical reach of professional assessments and should therefore be interpreted as reputational connectivity rather than direct evidence of financial integration. Flow-based network analysis instead

examines how centres are connected through observable economic relationships. A comprehensive assessment should preserve this distinction before determining whether reputational visibility corresponds to functional network centrality (Fig. 1).

Figure 1 demonstrates that a financial centre's international position cannot be represented by one dimension. Attribute-based competitiveness describes conditions supporting financial activity, reputational visibility reflects recognition among market participants, and functional network connectivity identifies the centre's role in cross-border relationships. Separating them prevents recognition or favourable business conditions from being treated as evidence of financial intermediation.

This distinction is important when interpreting the Global Financial Centres Index. The GFCI assesses financial-centre competitiveness rather than directly measuring financial relationships between cities. Its rating combines professional assessments with instrumental factors covering the business environment, human capital, infrastructure, financial-sector development, and reputation. GFCI 39 uses 147 instrumental factors from external sources and 34,468 assessments supplied by financial professionals [8, p. 4]. It therefore incorporates quantitative information and market perceptions.

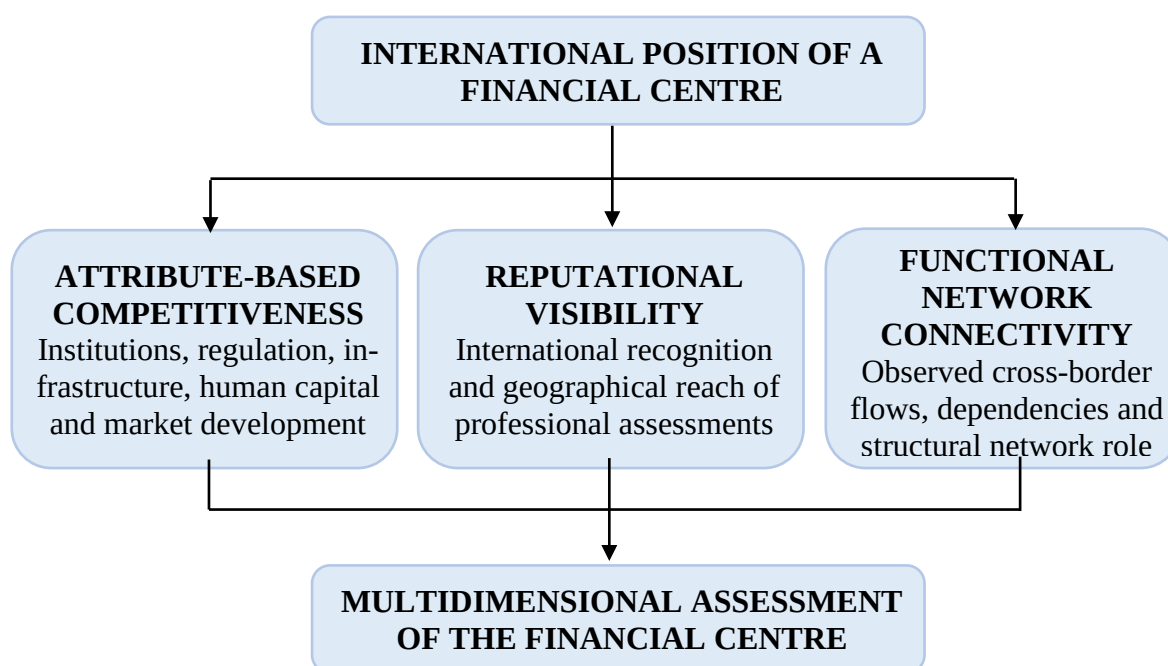


Fig. 1. Dimensions of the International Position of a Financial Centre.

Source: developed by the authors based on [8; 11; 12].

Most instrumental factors describe conditions within a city or country, including regulation, innovation, government effectiveness, infrastructure, taxation, labour markets, and economic performance. When city-level information is unavailable, national values may be assigned to all centres in the same country [8, pp. 47–49]. These indicators are relevant to competitiveness but do not identify the origin, destination, or intermediation of financial resources.

Respondents assess financial centres as places to conduct business, while a machine-learning model relates their assessments to instrumental factors to estimate ratings for centres they did not evaluate. Actual and predicted assessments are then combined [8, pp. 47–48]. The rating consequently reflects expected competitiveness based on observed conditions and professional perceptions, not cross-border financial flows.

Within GFCI, connectivity forms one of three profile

dimensions alongside diversity and speciality. It is derived from the geographical distribution of assessments given and received by professionals in other centres. Inbound connectivity reflects the locations from which a centre receives assessments, while outbound connectivity reflects the centres assessed by respondents based there [8, p. 17]. GFCI 39 classifies a centre as global when at least 45% of its weighted assessments originate from respondents in other centres and as international when the proportion exceeds 22% [8, p. 17].

This approach captures geographical reach: assessments from numerous locations indicate international visibility, while locally based respondents evaluating many centres demonstrate broad professional awareness. However, a perception-based relationship does not establish a transaction, ownership link, institutional affiliation, payment flow, or contractual exposure. Nor does the number of assessment locations measure the value, frequency, direction, or stability of economic interactions. Centres with similarly dispersed assessments may therefore occupy different positions in banking, investment, ownership, or payment networks.

The profile also depends on respondent composition. Although home-centre assessments are excluded and eligibility and time-weighting rules are applied, the geographical distribution of respondents can influence inbound and outbound breadth [8, pp. 47–48]. Established centres with internationally active professional communities are more likely to generate and receive geographically dispersed assessments. The indicator remains informative, but as evidence of professional recognition rather than a complete measure of functional integration.

Threshold-based classification introduces an additional limitation by converting continuous assessment patterns into discrete global and international categories. Centres immediately above and below a threshold may be classified differently despite similar profiles, while the thresholds do not distinguish the economic importance of assessment locations.

The GFCI connectivity profile should therefore be retained as a reputational measure. It shows how broadly a centre is recognised within the international financial community, whereas a flow-based network model examines its participation and structural role in observable economic relationships. The methodological problem lies not in using GFCI connectivity but in equating it with functional network integration. The two dimensions should be compared without substituting one for the other.

A flow-based assessment of international financial centres requires the financial system to be represented as a directed and weighted network. Let $(G = (V, E, W))$, where (V) is the set of financial centres, (E) is the set of observed relationships between them, and (W) is the matrix of edge weights. An element (w_{ij}) represents the value or intensity of a relationship directed from centre (i) to centre (j) during a defined period. This representation makes it possible to distinguish the internal scale of a centre from its position in the international distribution and intermediation of financial activity.

Network construction begins by defining nodes as

cities, jurisdictions, markets, or institutional clusters. These units are not equivalent. City-level analysis is appropriate when activities can be assigned to urban locations; jurisdiction-level analysis is necessary when statistics are reported nationally or territorially. Combining both levels may distort results because cities and jurisdictions represent different degrees of aggregation. The selected unit must therefore be established before data collection and applied consistently.

The second decision concerns the economic meaning of edges. Banking claims represent credit exposures; direct and portfolio investment positions indicate asset and liability allocation; ownership links reflect corporate control; payment traffic captures settlement intensity; and infrastructural connections show how operations are cleared, settled, or held in custody.

These relationships should form separate network layers because they differ in meaning, units, duration, and risk. Combining raw values would produce uninterpretable weights, while aggregation after normalisation would require explicit assumptions about each layer's importance and could conceal specialised functions.

The banking layer may be constructed from bilateral cross-border claims and liabilities. Its edges are directed, since the exposure of institutions located in centre (i) to counterparties in centre (j) is not necessarily equal to the reverse exposure. Stocks describe accumulated financial positions at a particular date, whereas flows measure changes during a period. These measures should not be treated as interchangeable: a centre may hold a large stock of foreign claims while generating relatively limited new lending during the period under examination.

The corporate ownership layer represents companies and ownership links directly or aggregates them by financial centre. Vitali, Glattfelder, and Battiston demonstrate that international corporate control forms a highly concentrated network in which a relatively small core of interconnected financial institutions occupies a structurally important position [13, pp. 1–6]. Such data can reveal channels of control and dependency, but a legal ownership link does not necessarily indicate a contemporaneous financial flow. The layer therefore measures the architecture of corporate control rather than the current movement of funds.

The investment layer includes direct and portfolio investment. Foreign direct investment is useful for identifying longer-term ownership and control relationships but may be strongly affected by special-purpose entities and pass-through jurisdictions. Haberly and Wójcik show that the global offshore FDI network is structured by regional blocs, historical relationships, and intermediary jurisdictions rather than by market size alone [14, pp. 251–280]. Accordingly, a centre recording substantial inward and outward investment may function as a conduit rather than as the ultimate source or destination of capital.

The payment and financial-infrastructure layer reflect the operational connections through which transactions are cleared, settled, recorded, or transferred. Potential edges include bilateral payment messages, settlement instructions, correspondent-banking relationships, exchange access, clearing membership, and custody arrangements.

These data can provide a closer approximation to the intensity of ongoing financial interaction. However, detailed bilateral information is frequently confidential, commercially restricted, or available only in aggregated form. The availability of a data source should consequently not be confused with its public accessibility or completeness.

A multilayer model requires temporal consistency: year-end stocks, annual flows, and counts of institutional relationships are not directly comparable. Exchange rates, inflation, mergers, regulatory reclassification, and reporting revisions may also affect comparisons. Static networks describe one period, whereas dynamic networks reveal whether structural roles change after crises, reforms, geopolitical events, or technological developments.

Network analysis also remains subject to measurement error. Financial activity may be booked outside the location where decisions are made, and headquarters, subsidiaries, special-purpose entities, or platforms may assign transactions differently. Database coverage is particularly incomplete for private firms, non-bank intermediaries, offshore entities, and confidential positions. Flow-based indicators are more relational than perceptions but not fully objective.

The proposed framework consequently treats international financial connectivity as a multilayer construct. For

each layer, the researcher must specify the unit of analysis, economic meaning of the edge, direction of the relationship, weighting variable, reporting period, and limitations of the underlying data. Centrality indicators should first be calculated separately for each network. Their results may subsequently be compared across layers to identify centres that consistently perform donor, recipient, intermediary, or infrastructural functions. This approach preserves the economic content of each relationship and prevents a formally comprehensive but conceptually ambiguous connectivity score.

The analytical value of a network model depends on whether the selected centrality indicators correspond to the economic process represented by its edges. In a weighted directed network, the number of connections alone is insufficient because financial links differ substantially in their magnitude and direction. Opsahl, Agneessens, and Skvoretz demonstrate that weighted centrality should account for both the existence and intensity of relationships [15, pp. 245–251]. Accordingly, the present framework uses node strength, closeness, and betweenness to identify different functional roles of financial centres.

For centre (i), outgoing and incoming strength are calculated as:

$$s_i^{out} = \sum_{j \neq i} w_{ij}, \quad s_i^{in} = \sum_{j \neq i} w_{ji};$$

where:

(w_{ij}) is the value of the flow from centre (i) to centre (j).

Outgoing strength characterises a centre as a source or distributor of financial resources, whereas incoming strength reflects its role as a recipient. These indicators measure the aggregate intensity of direct relationships but do not identify whether the centre provides access to the

wider network.

Closeness centrality requires financial-flow weights to be transformed into distances. Because a larger flow represents a stronger relationship, the illustrative calculation applies the inverse transformation:

$$l_{ij} = \frac{1}{w_{ij}}; \quad w_{ij} > 0,$$

where:

(l_{ij}) is the length assigned to a direct edge.

The network distance (d_{ij}) is the minimum sum of edge lengths among all directed paths from (i) to (j).

Outgoing closeness is then calculated as:

$$c_c^{out}(i) = \frac{n-1}{\sum_{j \neq i} d_{ij}}.$$

A higher value indicates that the centre can reach other nodes through relatively strong direct or indirect relationships. The inverse transformation is analytically convenient but remains an assumption: it treats a sequence of high-

value links as a shorter route than a weak direct connection.

Betweenness centrality measures the extent to which a centre lies on the shortest paths connecting other nodes. Its normalised form for a directed network is:

$$C_B(i) = \frac{1}{(n-1)(n-2)} \sum_{s \neq i \neq t} \frac{\sigma_{st}(i)}{\sigma_{st}}$$

where:

(σ_{st}) is the number of shortest paths from (s) to (t);

($\sigma_{st}(i)$) is the number of those paths passing through centre (i).

Brandes provides an efficient procedure for calculating this indicator in weighted and unweighted networks [16, pp. 163–177]. Economically, high betweenness may indicate an intermediary position, but its interpretation assumes that the relevant financial process can follow the shortest available path. As Borgatti notes, the suitability of a centrality measure depends on the type of flow

represented by the network [17, pp. 55–71].

The calculations are demonstrated using three hypothetical financial centres, *A*, *B*, and *C*. The values represent directed financial flows in conditional units and do not describe actual cities. Table 1 combines the initial adjacency matrix with the calculated indicators.

Table 1

Illustrative Matrix of Financial Flows and Network Centrality Results

Centre / indicator	Flow to A	Flow to B	Flow to C	Incoming strength	Outgoing strength	Outgoing closeness	Normalised betweenness
A	0	50	10	25	60	27.2727	0.0000
B	20	0	30	65	50	24.0000	1.0000
C	5	15	0	40	20	10.9091	0.0000

Source: calculated by the authors using hypothetical data.

The strength indicators show that *A* is the principal source of flows, with an outgoing strength of 60, while *B* is the largest recipient, with an incoming strength of 65. Centre *C* has the lowest outgoing strength and therefore performs a more limited direct distribution function.

The shortest-path calculation changes the interpretation obtained from direct links alone. The direct distance from

A to *C* equals $1/10 = 0.1000$, whereas the indirect route $A \rightarrow B \rightarrow C$ has a total length of $1/50 + 1/30 = 0.0533$.

Similarly, the direct distance from *C* to *A* is $1/5 = 0.2000$, while the route $C \rightarrow B \rightarrow A$ has a length of $1/15 + 1/20 = 0.1167$. The shortest directed distances are therefore:

$$\begin{aligned} d_{AB} &= 0.0200, & d_{AC} &= 0.0533; \\ d_{BA} &= 0.0500, & d_{BC} &= 0.0333; \\ d_{CA} &= 0.1167, & d_{CB} &= 0.0667. \end{aligned}$$

Consequently, *A* has the highest outgoing closeness:

$$C_c^{out}(A) = \frac{2}{0.0200 + 0.0533} = 27.2727.$$

For *B* and *C*, the corresponding values are 24.0000 and 10.9091. Centre *A* therefore provides the most efficient outward access to the remaining network under the assumed distance transformation.

Centre *B* lies on both indirect shortest paths connecting *A* with *C* and *C* with *A*. Its normalised betweenness consequently equals 1.0000, while the values for *A* and *C* equal zero. *B* therefore performs a distinct intermediary function even though it is neither the largest source of flows nor the centre with the highest outgoing closeness.

The example demonstrates that different measures identify different network roles: *A* is the principal distributor and has the strongest outward accessibility, *B* is the principal recipient and intermediary, and *C* remains comparatively peripheral. No single centrality indicator captures all these functions. The assessment of functional connectivity should therefore preserve a profile of complementary indicators rather than reduce them to a single composite network score.

The coexistence of different network roles supports comparing rather than aggregating reputation and centrality. The international importance of financialised world cities reflects uneven combinations of institutional influence,

organisational concentration, intermediation, and control over cross-border relationships [18, pp. 752–775]. A widely recognised centre may be peripheral in a selected flow network, while a less visible centre may perform a major intermediary function.

The framework therefore uses two dimensions. The horizontal axis represents reputational visibility, operationalised through the geographical breadth of inbound and outbound GFCI assessments. The vertical axis represents centrality in a specified cross-border network, measured by incoming or outgoing strength, closeness, betweenness, or an explicitly justified combination.

Variables should be normalised for the same period, and positions may be determined using medians, quantiles, or clusters. The selected boundary must be reported because alternative thresholds may reclassify marginal cases. Separate models should be constructed for banking, investment, ownership, and payment networks rather than merging heterogeneous relationships into one score.

The intersection of the two dimensions produces four analytical types of international financial centres, as presented in Table 2.

Table 2

Two-Dimensional Framework for Assessing International Financial Centres

	Lower reputational visibility	Higher reputational visibility
Higher functional network centrality	Under-recognised functional intermediary / Structurally important but insufficiently reflected in professional assessments	Integrated global centre / Combines international recognition with a central role in observable cross-border relationships
Lower functional network centrality	Peripheral or emerging centre / Limited professional recognition and restricted participation in the selected network	Reputation-dominant centre / Internationally visible but less central in the selected flow network

Source: developed by the authors based on [8; 15; 17; 18].

An **integrated global centre** combines extensive international recognition with a central position in the relevant flow network. Its reputation is supported by observable participation in cross-border relationships. Depending on the selected indicator, it may act as a major source or recipient of financial resources, provide efficient access to other centres, or perform an important intermediary function.

A **reputation-dominant centre** receives broad professional recognition but has comparatively low functional centrality in the network under examination. This position does not necessarily indicate that its reputation is unjustified. The centre may be important in a financial activity not captured by the selected data layer, or its reputation may reflect institutional quality, historical influence, specialised knowledge, or expectations about future development. The observed discrepancy should therefore initiate further analysis rather than be treated as direct evidence of overvaluation.

An **under-recognised functional intermediary** occupies a central structural position despite relatively limited reputational visibility. Such a centre may channel capital, connect otherwise weakly linked regions, host specialised entities, or provide critical payment, custody, or settlement functions. Its importance may remain underestimated when rankings rely primarily on general professional awareness or broad competitiveness characteristics.

A **peripheral or emerging centre** combines limited visibility with low centrality in the selected network. This category may include centres at an early stage of international development, locally significant centres with restricted cross-border functions, or specialised centres whose principal activities are absent from the selected network layer. Its position may change over time as market access, institutional capacity, and international relationships develop.

The framework is diagnostic rather than hierarchical. It does not assume that every centre should become an integrated global centre or that high centrality is unconditionally beneficial. An intermediary position may create income and influence but can also increase exposure to external shocks and regulatory pressure. Similarly, a specialised centre may remain sustainable without achieving broad reputational reach. The analytical value of the model lies in identifying the source of a centre's international importance and revealing discrepancies that require explanation.

The framework also supports dynamic analysis. Repeated observations can determine whether changes in reputation precede changes in financial relationships, whether

functional centrality develops before international recognition, or whether the two dimensions diverge following crises, regulatory reforms, technological innovations, or geopolitical disruptions. Its empirical application would therefore allow the GFCI connectivity profile to be used alongside, rather than as a substitute for, network indicators derived from observable cross-border relationships.

Conclusions. The study demonstrates that the competitiveness, reputational visibility, and functional connectivity of international financial centres constitute related but analytically distinct dimensions. Competitiveness characterises the institutional and economic conditions of financial activity; reputational visibility reflects international professional recognition; functional connectivity identifies a centre's position within observable cross-border relationships. Treating these dimensions as interchangeable may overstate the correspondence between a centre's reputation and its actual network role.

The analysis establishes that the GFCI connectivity profile should be interpreted primarily as an indicator of the geographical breadth of professional recognition. It provides relevant information about the international visibility of a financial centre but does not directly measure bilateral financial flows or structural intermediation. Its analytical value is therefore preserved when it is compared with, rather than substituted for, flow-based network indicators.

The proposed methodological framework represents financial centres as nodes in directed and weighted multi-layer networks. Banking claims, investment positions, corporate ownership, payments, and financial-infrastructure relationships should be examined as separate layers because they differ in economic meaning, measurement units, direction, and time structure. For each layer, node strength identifies source and recipient functions, closeness reflects access to the wider network, and betweenness reveals intermediary positions. The illustrative calculations confirm that these indicators may assign different functional roles to the same centre and should not be reduced to a single composite measure without explicit theoretical justification.

The two-dimensional framework differentiates integrated global centres, reputation-dominant centres, under-recognised functional intermediaries, and peripheral or emerging centres. Its scientific contribution consists in establishing a systematic basis for identifying correspondence and divergence between professional recognition and observable network position. The framework is diagnostic rather than hierarchical: it does not assume that high centrality is universally beneficial or that limited visibility

necessarily indicates weak functional importance.

The study is limited by its methodological character and the use of hypothetical data to demonstrate the calculations. Its conclusions do not constitute an empirical ranking of existing financial centres. Further research should apply the framework to comparable bilateral data on banking, investment, ownership, payment, or infrastructural relationships and examine changes in the resulting classifications over time. Such analysis would make it possible to determine whether reputational shifts precede changes in functional connectivity, follow them, or persist despite

transformations in the structure of international financial flows.

Declaration on the Use of Artificial Intelligence.

During the preparation of this article, the authors used DeepSeek (DeepSeek AI, 2025) to assist with manuscript structure, literature synthesis, and English-language clarity. All AI-assisted content was critically reviewed and verified by the authors, who assumes full responsibility for the article's accuracy, originality, scientific validity, and integrity.

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