Northumbria Research Link

Historical Social Network Analysis: Advancing new directions for international business research

Abstract:

Despite repeated calls for incorporating history in IB research, progress has been slow. The few existing IB studies utilizing historical approaches have relied mostly on historical narrative approaches. In addition, there is little methodological guidance on how to use historical methodologies in IB research. This article will highlight a growing methodological approach for consideration, one that demonstrates intersections across multiple disciplines through use of varied techniques, historical analysis and social network analysis (SNA) and source-bases (varied archival sources). This study will demonstrate the richness obtained from utilising historical source collections and the additional perspectives on transnational networks that can be obtained from analysing networks over longer periods. Specifically, we argue that the use of historical mixed methods SNA is suitable in addressing calls for contextual, longitudinal, multilevel, and processual explanations of IB phenomena

1. <u>Introduction</u>

A call from Aguinis and Edwards (2014) for management scholars to "accelerate theoretical progress" is one that can be answered through a diversification of contexts and sources with which to test theory, resulting in a reconfiguration of theoretical frameworks or indeed, the creation of new ones. One such promise of theoretical progress has emerged from the tradition of business history and historical organization studies. Indeed, as Buckley (2020**:**6) recently argued "the inclusion of longitudinal methods alongside cross-sectional work is likely to enhance credibility and to correct serious errors in interpretation." While many are calling for the use of historical methods and data to provide contextual richness and insights into evolutionary aspects of international business, now is the time to exemplify how such data can be used (da Silva, Casson and Jones, 2019). Moreover, we should now look to more explicitly demonstrate the theoretical benefits of exploring non-conventional methodological techniques derived from multiple disciplines, whether historical, sociological, anthropological, etc. (MacClean, Harvey and Clegg, 2017).

Much of the momentum for the use of historical methods (namely the collection, analysis and interpretation of historical documents) and archival data has come in the last twenty years with the so-called 'historic turn' in management and business scholarship, championed by scholars such as Suddaby (2016), Clark and Rowlinson (2004), Suddaby, Foster and Quinn-Trank (2010), and Brunninge (2009). One of the key benefits of the employment of historical data in management and business research is the enablement of longitudinal perspectives. The motivation for this article comes from a desire to rectify a clear omission in the literature on international business networks that engage with temporality,

particularly through the use of historical data. A longitudinal lens is critical when examining evolutionary process and contexts in international business (Burgelman, 2011). We argue that an approach that warrants IB researchers' attention is mixed methods historical social network analysis (SNA) due to its ability to provide contextual, longitudinal, multilevel, and processual explanations of IB phenomena. The mixed method approach within IB and other management disciplines is by its very nature, diverse and often incorporates method triangulation in order to increase research rigour (Denscombe, 2008; Nielson et al. 2020; Hurmerinta-Peltomäki, & Nummela, 2006). As Nielsen et al. (2020) suggest, methodological changes encounter significant barriers, particularly in well-established fields; however, consideration of new approaches, techniques and methods through triangulation can lead to exceedingly rich research opportunities. In this article, we take a particular view on mixed methods and triangulation as a key part of historical SNA involving the use of network graphs, attributes alongside textual analysis of archival documents in order to contextualise networks and provide a holistic view of network function and characteristics.

A key feature in examining inter-organizational relationships is the formation, transformation and inevitable dispersion of networks. Networks have an array of definitions ranging from basic to quite specific, for the purposes of this paper the definition used by Smith-Doerr and Powell (2005: 380) is employed. They define networks as '*formal exchanges, either in the form of asset pooling or resource provision, between two or more parties that entail on-going interaction in order to derive value from the exchange*.' The use of SNA has spanned the boundary of many disciplines from the social sciences to the sciences to humanities. While first mostly present in organization studies, the use of SNA has become fundamental in many strands of management and business research as social networks are increasingly recognised as a critical element of business and society (Clegg et al., 2016).

This article will serve to offer up a growing methodological approach for consideration, one that demonstrates intersections across multiple disciplines through use of varied techniques (historical analysis and SNA) and source-bases (varied archival sources). The article has four aims: first, to show the value and novelty in examining international firm networks over time. Second, to aid in moving beyond short-frame network examination that only allows for static and sometimes superficial understanding of network growth, contraction and behaviour in general. Third, to explain how the use of mixed method and/or method triangulation with historical sources can provide a more comprehensive interpretation of change over time in global firm networks, which allows for both an overview of network characteristic transformation and relationship-specific dynamics. Finally, to reveal the evolutionary and strategic implications from researching network cycles this study will highlight possible avenues of research supported by extensive archival collections, demonstrating the richness obtained from utilising historical source collections and the additional perspectives on transnational networks that can be obtained from analysing networks over longer periods.

Our article is structured as follows: we started by providing an overview of network perspectives in IB research and through which we highlighted the lack of longitudinal approaches that rely on SNA. We then provided an overview of the contributions of IB history scholars on historical network research to highlight the potential of using SNA in enhancing our understanding of IB phenomena. Afterwards we provided a detailed discussion on our proposed historical SNA covering issues of data collection and analysis. We ended our discussion by highlighting key research areas that can benefit from the use of historical SNA.

2. <u>Network Perspectives in International Business Research</u>

A central perspective in IB research is the use of a network lens through which firms are conceptualized as "embedded in social networks with other actors" (Andersson, Forsgren, & Holm, 2002: 980; Granovetter, 1985) to understand the path-dependent process of network development and change over time, and the implications of network embeddedness for firms' behaviour and strategies. Studies employing a network perspective have enriched our understanding of international entrepreneurship (Coviello, 2006), internationalization of SMEs (Chetty & Holm, 2000) speed and characteristics of internationalization (Musteen et al., 2010), knowledge transfer (Khan, Rao-Nicholson & Tarba, 2016; Sandberg, 2014), HQ- subsidiary relationships (Geppert & Dörrenbächer, 2014), types of cross-border relationships (Holm, Eriksson & Johanson, 1996; Pedersen, Soda & Stea, 2019) and explore how business interacts with its environments (Welch & Wilkinson, 2004; Jansson, Johansson & Ramstrom, 2007).

This stream of studies builds in different ways on early sociological work on networks (Granovetter, 1973; Burt, 1992, 2000 & 2004; Rauch 2001; Coleman, 1988) which has led to the incorporation of more nuanced approaches to network dynamics in organisations studies and indeed in IB. Work investigating network attributes such as network density and actor position (Granovetter, 1973), network bridging (Burt, 2004), reputation-creation and benefits of network membership (Coleman, 1988) have been adopted in numerous IB perspectives to explain actor behaviour and firm performance in global business. Scholars have also examined network dynamics, types and the performance and outcomes of such networks in international business. For example, network embeddedness is considered a critical factor in examining inter-firm relationships on a global scale because of what can be transmitted through networks and what networks can provide to its members as a result of their embeddedness (Welch & Wilkinson, 2004; Halinen & Tornroos, 1998; Uzzi, 1997).

While some scholars take a more general view of networks as a strategic resource and a source of competitive advantage, others have focused in on network dynamics, shape, and characteristics through SNA techniques. SNA can be defined as:

"a series of formal procedures for the analysis of relations as well as a theoretical perspective on these relations. Evolving at the intersection of several disciplines, such as sociology, anthropology, mathematics, psychology and physics, SNA has developed methodological tools to map and to analyse the structure of relations and positions (e.g. Borgatti et al., 2009; Freeman, 2004; Watts, 2004). SNA fundamentally differs from typical models of 'variable centred sociology' (Abbott, 1988) because it examines relations and thus assumes dependence of its units of analysis." (Mutzel, 2009: 881)

SNA provides a core human and social element to our understanding of business process and strategies which are central in understanding firm behaviour. Yet despite the potential of SNA in explaining network configuration development and change overtime, as Kurt & Kurt (2020) show in their survey of SNA in IB research theoretical contributions are limited due to the use of overly conventional methods and a lack of advancement in inter-disciplinarity. Their overview of the SNA data employed, reveals a range but all rather conventional for IB research; only two studies appeared to employ distinct archival data or longitudinal approaches with the majority using UCINET as the software applied.

Calls for more longitudinal perspectives in IB research has been consistently made to further enhance our theorizing of IB phenomena (Burgelman, 2011). This is particularly important in network research because as Clegg et al. (2016: 284) argue "understanding how a network structure evolves not only in terms of the dynamics of one type of tie but in terms of the dynamics of tie transformation, where weak ties become strong, distrust becomes trust, etc. is a challenging but essential task for network research." Despite the importance of longitudinal research in network research, the use of longitudinal approaches is rare. For example, Turkina and Assche (2018) examine global integration of innovation clusters from a comparative perspective over three distinct periods (2002-2005, 2006-2009 and 2010-2014). This method is important for both its comparative approach and emphasis on examining change over time. That said, the longitudinal analysis employed is comparatively short when compared to network studies undertaken in business history (Buchnea, 2015; Haggerty & Haggerty, 2011). An exception is Hatani and McGughey's (2013) study on network performance in the context of large-scale global expansion using a longitudinal analysis of the Toyato Group over 60 years of network evolution. Stressing on the importance of longitudinal analysis the authors argue that they identified "seemingly subtle but powerful changes in network evolution that would most likely be overlooked in cross-sectional research designs" (Hatani and McGaughey, 2013, p. 463). Therefore, an incorporation of both historical data sources and methods may allow for a more in-depth analysis of networks in IB research. As Kurt & Kurt (2020, p. 10) argue, one of the ways SNA research in IB scholarship can be advanced is through the incorporation of longitudinal approaches that will "reveal dynamic changes of network structures and actor positions over time". Therefore, we argue that the incorporation of historical SNA from the field of business history can be fruitful in addressing this shortcoming in IB research. In the next section we highlight the contributions of business history studies adopting a historical SNA to our understanding of IB phenomena.

3. History meets social network analysis

Greater understanding of transformational shifts is often the focus of network research in international business history and has emerged as an important topic but with varied approaches and data. Wetherall (1998) argued that the adoption of SNA in historical studies was lacking; however, since this article there has been a substantial incorporation of SNA in many strands of history, and in particular business and economic history. Casson and Cox (1993) early study on historical international business networks laid fruitful ground for business historians to adopt network analysis at various levels. However, this study separates informal networks of the nineteenth century and earlier from what they deem the hierarchical MNE structures of the twentieth century. One could argue, based on the research cited above, networks of multiple forms and types, similar to those Casson and Cox (1993) examine are present in international business today. Network studies in business history have on one hand employed a general understanding of networks and networked relationships and on the other, incorporated more distinct sociological methods and SNA theory, including use of SNA software.

In the business history literature, a range of themes and topics have been explored within the context of networks (for an overview, see Buchnea, 2017). As in mainstream management and business scholarship, longitudinal and historical reflections of corporate networks have emerged as a common theme; these have been examined in various spatial contexts such as the US and UK (Buchnea, Tilba & Wilson, 2020; Wilson, Buchnea & Tilba, 2018; Scott, 1997), Mexico (Del Angel, 2016), Portugal (Da Silva, Amaral, & Neves, 2016) and the Netherlands (De Jong, Roëll & Westerhuis, 2010). Business historians have also chosen to demarcate networks by certain characteristics that bind them, such as religion (Landes, 2015), ethnicity or nationality (Hancock, 2005) and family (Forestier, 2010; Mathias, 2000). Within these studies, networks are examined in terms of related themes of trust, reputation, risk and embeddedness. In the literature of the last twenty years, the prominence of industrial clusters and industry-related networks has also garnered increasing attention, particularly in relation to early British industries (Wilson & Popp, 2003;). However, that which has received the most attention from a business (and economic) history perspective are international trade networks, particularly of the early modern period (1600-1800) with focus on varying geographic regions such as the Atlantic economy (Buchnea, 2015, 2020; Haggerty & Haggerty, 2011; Hancock, 2005 Marzagalli, 2005) the Mediterranean and Middle East (Aslanian, 2006) and Asian regions (Smith, 2018; Aldous, 2017;). This focus on international business history and networks is unsurprising and some have argued that histories of globalisation are inevitably histories of global networks (Divall, 2012). Of these, some have adopted social network theory very distinctly, but fewer have chosen to apply SNA software to their analyses. Studies that employ SNA software and accompanying visualisations include Haggerty's (2012) and Haggerty & Haggerty's (2011; 2017) studies of the Atlantic world with focus on the Liverpool merchant community. Since Haggerty & Haggerty's (2010) initial work, the inclusion of SNA techniques and use

of visual analytics through SNA software has become more prevalent (Buchnea, 2015, 2020; Smith, 2018; Wright, Ville & Merrett, 2019).

The use of SNA techniques and software that allows for visual analytics is critical for temporal comparisons, As Vedovelli (2018) argues, the importance of analysing social ties in context and over time is crucial as a way of linking multiple environments, social, institutional, financial and providing insights into the unfolding of events and business processes. Using historical data alongside SNA techniques presents a different perspective on the role of context and external forces in global network change. Networks in the long run allow for a lens onto shifting contexts and environments which in and of itself is significant for understanding growth and transformation of firms in international business. The next section presents the methodological approach that we are proposing- historical SNA.

4.   Historical Social Network Analysis: a methodological proposal

As Kurt and Kurt (2020) demonstrate in their review of the literature, data utilised in SNA are often quantitative, occasionally qualitative but rarely mixed methods. Mixed methods can be defined as 'the use of two (or more) research methods in a single study when one (or more) of the methods is not complete in itself' (Morse, 2016). For the purposes of the methodological process proposed here, mixed methods incorporates both use of SNA techniques and software, alongside the qualitative textual analysis of archival collections (as one approach within historical SNA). We will discuss the process for historical SNA that would incorporate the use of SNA software in order to obtain network measures and create visualisations which become an iterative tool for understanding the significance of network structure and identifying strategically important relationships (Bruning et al., 2012). What is most interesting while examining different methodological approaches to collecting network data is the level of variation: the different data collection techniques, the different actor relationships and the different measures utilised to evaluate these relationships. As such, articulating a distinct methodological process for historical SNA may prove insightful to those seeking different approaches and source bases for testing social network theories.

Network analysis places emphasis on network measures or attributes; however, ending SNA at these measures can leave gaps in our understanding of network and relationship dynamics within and between firms. As Salancik (1995: 346) observed "interactions, the building blocks of networks, are too easily taken as givens. Partly, this is because of the perspective of the network analyst, whose purpose is to focus on the forest." Not devoting some time to explore 'the trees' means that information about relationship dynamics within networks is often missed. This section will elaborate on the general methodological process that can be adopted in historical SNA, beginning with data collection and

triangulation, moving to SNA coding and visualisation and ending with identifying network characteristics, outcomes and theoretical meanings of specific network structure and relationships.

Figure 1 offers a process model that scholars may adopt when attempting historical SNA. The process discussed in detail below follows several stages of data collection and analysis, including the triangulation of both quantitative and qualitative historical data. Triangulation is regarded as a research strategy by which researchers can obtain a truer, more comprehensive view of the research topic (Nielsen et al 2020). Nielsen et al (2020) also regard it as a 'research mindset'. This aligns with the approach of a historian, who can encounter significant gaps in data or biases which require triangulation strategies in order to fill these gaps and provide richer contextualisation.

To illustrate change over time and evolution in networks, researchers may opt to adopt temporal brackets (Langley, 1999). The selection of temporal brackets appears to differ across disciplines and researchers, where some might create their own or import 'periodization' based on events or eras they deem significant and others will opt for equal temporal brackets (for example, periods of ten years) (Rowlinson, Hassard & Decker, 2014). The process detailed below and illustrated in the model (figure 1) would be repeated for each phase or temporal bracket. Whichever method adopted, exploring phases in network evolution is strongly recommended in historical SNA as examining one network lacks engagement with the transformative nature and dynamism of social networks.
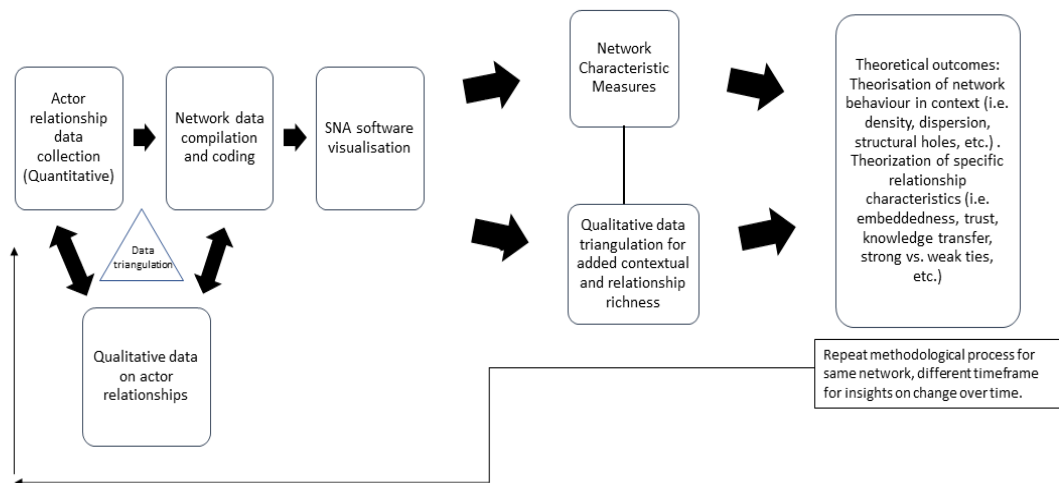

Figure. 1 Historical social network analysis methodological process model

4.1 Actor Relationship Data Collection

To derive network attributes, big data sets of actor relationships populate scripts that are imported into software programmes such as UCINET, Gephi and Pajek. The network attributes generate

characteristics such as degree centrality, in-betweenness centrality and density measures. The sources of this quantitative data may differ but need to allow for clear articulation of directed or non-directed ties to be established. Data is often collected at varying levels depending on the purpose of the analysis; most commonly, this is at a firm or individual level, often meso or micro-level. Cupyers et al. (2020) draw on four different levels typically found in research (inter-personal networks, inter-subsidiary networks, inter-firm networks and inter-location networks). In IB, a common strand examines vast subsidiary networks. Contributors such as Dimitratos, Liouka and Toung (2009) have used survey data from subsidiaries within developed countries (264 subsidiaries); although they did not employ SNA software to isolate network attributes. Inter-firm networks constructed using quantitative data have also been explored at industry level, such as Iurkov and Benito (2020), who examine inter-firm networks within the US ICT industry from 2000-2008. For the network data, they utilised the SDC Platinum Joint Ventures & Alliances database which provide network relationships data in the form of firm-to-firm collaborations. Several studies use multiple sources of quantitative data to allow for data triangulation and a resultant 'complete' network (Sharma et al, 2019).

The techniques for collection of such data have been learned from the sociological tradition and in doing so, reveal the potential in this data for spatial and temporal comparisons. Particularly from an IB perspective, quantitative historical data on firms, business communities and regions that would allow for long-run network construction and analysis is ripe for utilisation and has the potential to provide rich theoretical insights. For example, for historical corporate network analysis, studies have used a range of data sets available to collate data on twentieth century corporate boards including the Stock Exchange Yearbook, Times 1000 list, Thompson One, annual reports and BoardEx (Buchnea, Tilba & Wilson, 2020). Other studies have used this interlock data to then gather further biographical information on board members (see chapters in David & Westerhuis, 2014). Rather than focusing in on individuals, other studies which incorporate sectoral or industrial analyses have examined connections at firm level (Garnett, Mollan & Bentley, 2015). Studies have also utilised account books or ledgers to construct transactional networks (Haggerty & Haggerty, 2010), company investor records (Smith, 2018), club/trade association minutes and registers (Wright, Ville & Merrett, 2019), custom house records that detail goods sent and received by firms and most often, correspondence collections and letter books (Buchnea, 2015, 2020; Haggerty & Haggerty, 2011) which can be translated into pure relationship data. While these techniques allow for an understanding of network shape and composition, what is often lacking in SNA is the meaning ascribed by actors to the network structural characteristics; the inclusion of more qualitative data sources allows for further investigation into network relationships, their building blocks (trust, social capital, embeddedness, etc.) and network consequences.

SNA, particularly through use of visualisation, can often be seen as a gateway to more in-depth analysis of inter-organisational relationships, particularly as it relates to trust, social capital, and human capital accumulation. A small but significant number of studies in IB utilising SNA have chosen a more

qualitative approach in their data collection for SNA. For instance, Coviello (2006) utilised 'in-depth interviews' which highlighted key relationships in each firm's history. Other studies in IB journals which employ qualitative data sources also tend to use interview data as the primary source, even if the content of the data differs (Wang et al, 2017;). In historical SNA, network data is often accompanied by archival qualitative sources. Such data allows the researcher to obtain a level of rigour in the investigation by adding important contextual information to the network relationships. This approach echoes calls made by numerous scholars for "increased plurality", "dual integrity" and to contribute to the questioning of theoretical frameworks and analytical categories by using varied sources (Grodal, Anteby & Holm, 2020; Da Silva, Casson and Jones, 2019; MacClean et al., 2017). For qualitative historical sources within historical SNA, one can see a proliferation of network studies in what we might term a 'pre-modern' era.

For research on global networks in the age prior to the telegraph and even after, correspondence collections have become a treasure trove for historians looking to reconstruct social networks. As Hollow (2020, p. 76) observes, 'from both a material and a cultural perspective, the letter played a crucial role as a networking technology in the Victorian society'. Indeed, especially where correspondence was business-related, collections are often robust with clear record-keeping of letters: those sent, received and sometimes both (as an example, see correspondence of the Baring and Rothschild firm utilised by Buchnea, 2020; Shaw family correspondence held over several collections and utilised by Popp & Holt, 2013). Letters as the only transmitters of information in international business, were more valuable than the cargo or specie abroad trading vessels. Their survival becomes a remarkable resource for reconstructing international business networks and given that some archival correspondence collections span decades, there is tremendous opportunity to reconstruct vast longitudinal global networks. While correspondence collections aid in network construction, they also contain illuminating qualitative information that allows a glimpse into the dynamics of network relationships, the transmission of knowledge, the communication of opinion and reputation and a host of other intimate firm and individual level details (Popp & Holt, 2013). Thus, historical studies that construct global networks of individuals and firms for analysis and complement this with rich qualitative data, essentially pursue a mixed method approach.

4.2 Historical data and sites of data collection

Historical methods have long employed approaches viewed as rigorous and largely reflexive which can add much value to IB research. As Welch and Piekkari (2017) note, greater use of multiple sources in triangulation to produce multiple accounts, all of which are laid bare, is a truer representation of qualitative research. Scholars across many disciplines have remarked on the value achieved in integrating historical methods into management research (Colli & Fernandez-Perez, 2020; Decker et al., 2015; Perchard & MacKenzie, 2020;). The archive, in and of itself as a repository for much historical

data, is a complex space and while they hold a window into the past, their construction and collation serve a strategic purpose and reflects human intervention. As Popp and Fellman (2019) argue, "archives are epistemological spaces that help shape and form epistemic communities. That process builds collective or group identities and interests, not only among historians but also among other groups with an interest in or connection to corporate archives, most obviously archivists". Historians are trained to be aware of such interests and the extent to which external forces shape the data that is available to them. As such, historical sources and data should never be taken with complete validity; after all, historical data survives because of intentions and often not those of its original authors. With this recognition, historical sources and the archive as a repository can be extremely valuable to scholars so long as these limitations are recognised (Gill, et al., 2018; Das, et al. 2018).

Lack of historical contextualisation is often what can lead to misinterpretations when scholars attempt to transplant current typologies, environments, and understandings on the past (Wadhwani, 2016). Understanding the relationship of time and space to any given source is critical to appropriately representing and understanding that source. One must also understand that sources may be interpreted in different ways depending on what the researcher is looking for; there is no 'one size fits all' for historical methodologies, they are by their very nature 'pluralistic' (Maclean et al., 2015; Wadhwani, 2016). When using archives, historians undertake a 'reconstruction' of the past (Decker, 2013) while keeping close the knowledge of the context in which sources were created. For example, in network reconstruction, historians often employ personal correspondence records and with this, several variables must be observed: the author, the reader (or readers), the subject and the intention. Through understanding these aspects, one might come to question what is written and what is not written. Historical understanding comes as a result of knowledge of the past, it is cumulative; therefore, when reading sources, it is essential to build an understanding of the time and place in which those sources were created. Historical methodologies, therefore, cannot be described as formulaic, there is no strict pattern or process to interpretation and so much of how sources are used depends on the knowledge of the user/researcher (intersubjectivity). As Decker (2013: 160) argues, 'all reconstruction is inherently inter-subjective, at the very least because the past and present are always in a conversation in order to create a historical narrative.'

Gaps in historical accounts either intentional or unintentional can be overcome by certain data collection strategies, although how and whether each is employed depends on the data itself. For SNA, being able to construct a complete network is difficult with historical accounts, but not impossible. As the model indicates, much of the process requires data triangulation to ensure any gaps or significant information is not missed. Part of the process also requires an acknowledgement and acceptance of gaps – a feature of historical data collections to which historians are well-accustomed. Often where data for networks is incomplete, a combination of data needs to be used to both confirm existing actor relationships and fill the gaps for those missing. Diversity of sources enables triangulation in a way that

living sources cannot. For historical SNA, what is beneficial is, as Flick (2017) proposes, a 'triangulation of perspectives', whereby one can examine networks in international business by drawing from several theories, methods and traditions to produce a more comprehensive analysis. International business scholarship needs a rethinking of qualitative analysis outside of conventional methods and how the use of multiple source types may add richness not attainable through a single source type. Linked to this, Hatani and McGaughney (2013) expound the benefits of a mixed method approach in firm network analysis. Indeed, the idea of 'method triangulation' as well as 'data triangulation' that could fall under the umbrella of a mixed methods approach is seen as a beneficial approach to ensuring both validity, robustness and rigour (Nielson et al. 2020).

4.3 Network data compilation, coding and visualisation

Following an extensive exercise in data triangulation using both quantitative and qualitative sources, network relationships need to be organised and coded coherently so that all relationships are represented. The data is then compiled, coded and a script (if necessary) is generated, which is then inputted into SNA software for network visualisation. Historical studies use a range of software including Gephi (Buchnea, 2020), Pajek (Haggerty & Haggerty, 2011), Visone (Buchnea, 2015) and also, software developed by the scholars (Haggerty & Haggerty, 2017). Such a process requires precision and is often time-consuming, particularly in historical SNA which in some cases may draw upon several different sources. Typically, unique Actor IDs and relationships are entered into an excel spreadsheet or plain .txt document to allow for importation into the chosen SNA software. Some software such as Gephi, allows for the relationships to be entered directly into the programme, which may be advantageous for smaller networks. The process by which researchers compile and code data will differ but should produce a network structure of some description. For historical data compilation and coding, the process will mirror those adopted in social sciences and indeed IB studies; however, boiling down the data to simplified actor relationships is often more difficult and time-consuming because of the gaps mentioned above alongside the need for continual data triangulation. One addition to the process in historical SNA is the importance of change over time which must be reflected in the coding process. In this case, unique IDs for actors are essential to be able to track their individual (or firm level) activity through multiple network phases (Buchnea, Wilson & Tilba, 2020).

After coding and importing network data, visualisations can be produced. Figure 2 demonstrates an example of historical network data when visualised and employing temporal brackets. Buchnea's (2015) exploration of the Liverpool-New York trade and finance network and its evolution over a 60-year period illustrates the dramatic network transformations that can be illustrated through historical SNA. The visualisation of historical network data, while providing important network attribute measures, also acts as an iterative tool for further research by highlighting significant actors, clusters and relationships and in particular, network change over time. This is important in historical

SNA because often the diversity of data and gaps in data can lead significant actors, relationships or clusters being overlooked if not visualised.

Figure 2. The Liverpool-New York trade and Finance Network, 1763-1789, 1790-1815 and 1815-1830 (Buchnea, 2015).

4.4 Identifying network characteristics and theoretical outcomes

Following visualisation, historical SNA studies typically conduct an analysis of network attributes and use the visualisation as an iterative tool for comparison and to illuminate significant network structure changes and relationships. Structural significance emerges through both the 'structural properties' of a network and the position of actors within the network as a whole, while less attention is paid to the nuances of individual activity of specific relationships within the network. Structural significance is illuminated further through examining the life span of a network from network formation, emphasising the temporal aspects of SNA. Exploring change over time may lead to focusing in on the visualisation itself to demonstrate notable shifts in network population, density and dispersion (Buchnea, 2015). Studies that employ SNA techniques typically use key measures such as centrality, density and betweenness centrality; important measures that produce results that are largely quantitative in nature. The significance of network position can be derived from quantitative network measures such as degree centrality or 'eigenvector' and the analysis of egocentric networks. For international business, this can be significant for looking at social capital, power and social influence in cross-border relationships at various levels (Sultana and Turkina, 2020). If nodes or edges (links) are given particular attributes, for instance colour coded or weighted to reflect a particular industry/location/relationship, then conclusions can be drawn about particular types of actors or relationships in the network (Mahon et al., 2004). Also important in this, when researching global networks, is being able to represent location and how geographic spread or concentration of a network may change over time.

Network graphs or visualisations provide broad overviews of network shape and characteristics, while in some respects, overlooking the intricacies and nuances of relationships contained within the

network. Quantitative data certainly allows for the detection of a relationship as a starting point for where research can deepen. Therefore, inclusion of qualitative data at a later stage (see figure 1) allows for an elucidation of specific network relationship in terms of embeddedness, trust, knowledge transfer as well as relationship 'type'. Through this approach, the researcher can uncover further nuanced findings relating to themes of trust, embeddedness, resource transfer and further aspects of networked relationships.

Network structure, in terms of closed versus open networks, has been linked to the risks associated with embeddedness or 'overembeddedness'. Interesting studies on the concept of 'bridges' and 'structural holes' gained momentum with the work of Burt (1992; also related to Granovetter, 1973). This perspective focuses in on individual actors and their position within or between networks (structural capital), where they become key gatekeepers or brokers of capital. In many studies, trust emerges as an intrinsic part of close social networks, with reciprocal relations embedding relationships further, unassisted by formal arrangements (Uzzi, 1997). Structural embeddedness is dependent on the 'types' of relationships contained within a network and often manifests most impactfully within networks of close ties. 'Arm's lengths ties' and close ties inevitably serve different purposes and have varied ends (Uzzi, 1997), and over time 'arm's length ties' can become close ties. These transformative aspects of social networks only become apparent when examined in the long run and through the combination of quantitative datasets and qualitative data on specific relationships.

Other theoretical outcomes can be deciphered through the inclusion of qualitative data. Functions of a network, also referred to as 'network consequences' (see Borgatti and Foster, 2003 for a typology of studies on network consequences) are one such aspect. These consequences are categorised below:

1. Resource access/Knowledge exchange/learning/human capital accumulation

For example, how organizational knowledge is passed through organizations as managers move between subsidiaries and utilise intraorganizational networks (Manev, 2003). One may also see how particular types of information travel through a network, such as in the case of global financial crisis contagion (Oatley et al., 2013).

2. Reputation-building ('legitimation', 'status' 'structural capital')

Social capital, as a key intangible resource of networks and outcome of network membership, is one often gauged only though the use of qualitative sources. Through historical SNA using mixed methods one can determine the accumulation and longevity of such capital for individual actors and within network clusters (Lamikiz, 2013; Haggerty, 2013).

3. Economic consequences

Theoretical outcomes provided through SNA may also include economic outcomes with scholars both in IB fields and business history arguing that flexibility and relationship endurance can provide ongoing positive economic outcomes through reduction in transaction costs (Aldous, 2017). In research on historical trade and finance networks (Buchnea, 2020; Haggerty, 2013), historical SNA demonstrates that while positive economic outcomes and risk mitigation result from long-term networked relationships, the opposite can also be true; whereby, network actors become embedded in failing networks related to the network consequences detailed below.

4. Structural equivalence/closure /'convergence'

In keeping with the above, in-depth SNA through qualitative sources demonstrate the dynamics and outcomes of perceived 'dense' networks relating to network closure and structural equivalence (Hancock, 2005).

5. Commitment/embeddedness/reciprocity/'contagion'

Commitment, embeddedness, and reciprocity are a network consequence born out of growing trust and accruement of social capital in a network. Such network features are determined through a close inspection of relationships within and as such accomplished using qualitative sources. The development of embeddedness is also something that requires time and as such historical SNA can track the development of such features. Additionally, Coleman (1988) argues that the presence of social capital in a network in the form of 'extensive trustworthiness' and 'extensive trust' allows for friction-less actions and decisions, making such networks more productive. This is true to the extent that there is perhaps a greater level of agreement and freedom for members to act; however, embeddedness that comes with trust and network maturation can have negative impacts if actors' decisions and actions are allowed without question (also related to homophily). In historical SNA, one can see the evolution of embeddedness and thus instances where embeddedness leads to problems associated with obligation, homophily or isomorphism become more traceable.

Discussion and opportunities for future research

The methodological proposal presented above is one that lends from several research traditions in order to produce a holistic analysis of business networks over time. We present a step-by-step process and examples of types of data that can be used, as well as network characteristics and theoretical outcomes to be analysed. We find that a historical approach to SNA is diverse in both its type of data and methods of collection. This is born out of a need to find data when sources are scarce or fragmented, the diversity of business networks explored within the business and economic history literature and the contextual variation. Taking into account contextual aspects in relation to network change over time, one can achieve greater understanding of the role of external forces in network transformation in the long-run. This can in turn reveal important findings on network evolution, firm survival, resilience as well as failure in relation to network membership. In IB research, given the importance of context and

appreciation for the multitude of factors which shape global business, being able to analyse a global firm network from its conception, through its evolution and perhaps dissolution, invites significant opportunity for advancement of theory and insights into global firm networks in varying contexts.

As demonstrated above and by other commentators, longitudinal approaches provide extensive opportunities for scholars of global SNA and in IB research in general (Kedia & Bigili, 2015; Langley et al., 2013; Jones & Khanna, 2006). Within business history scholarship, the growth in the focus on aspects of globalization in the last ten years (Balleisen, 2020) in terms of topics such as foreign direct investment, emerging economies, global exogenous risks and trade and finance networks means that there has been a proliferation of research using sources and engaging with core themes that would be highly insightful to IB research. Networks are dynamic but the use of SNA in IB networks can only be equally dynamic if a longitudinal perspective is adopted. Additionally, historic ties play a role in shaping future relationships in a multitude of ways and therefore, it is critical to understand long-term actor-actor, actor-network and network-network relations (Kedia & Bigili, 2015). To reiterate Clegg et. al (2016), value is only obtained from SNA when evolution of networks is taken as a core research objective.

Through this, we also find immense value in further incorporation of historical methods in order to increase the credibility of long-run research and correct errors identified in current theorisations (Buckley, 2020). IB research can achieve methodological advancement through real consideration of historical sources to look outside the conventional and encourage methodological creativity (Langley et al., 2013). This also provides a tangible solution to the issue of a 'decline in the diversity of methods used' (Nielsen et al., 2020). For SNA in IB research in particular, consideration of historical SNA approaches and further examination of the wealth of available sources provides much broader ground for testing current network theory (Jones & Khanna, 2006) and for further 'long-run theorizing' (Buckley, 2020). In the next paragraphs, we provide a discussion on how this approach can be used to study network themes that are central in the IB field at the firm, intra-firm, and inter-firm levels of analysis.

Internationalization process: While firms' internationalization is widely conceptualised as a process that takes place over time, "[p]aradoxically, the majority of studies into this temporal phenomena have not taken a processual approach that incorporates time, dynamism and longitudinal observations" (Welch & Paavilainen-Mantymaki, 2014: 3). As repeatedly argued by IB researchers, the longitudinal and processual dimension of internationalization has been neglected (Jones & Coviello, 2005). This is often due to lack of longitudinal studies (McAuley, 2010), and/ or adopting a variance approach that focuses on identifying relationships between variables rather than a process approach that attempts to explain "patterns in events, activities, and choices over time" (Langley 2009, p. 409). As pointed out by Jones and Coviello (2005) many studies focus on specific events or episodes of internationalization

(see Melin, 1992) thus portraying internationalization as discrete points-in-time rather than a process over time. There is a dearth of studies focusing on long epochs of firm internationalization and biographic histories of MNEs (Melin, 1992). As such our understanding of "the multilevel, multidirectional causality, nonlinearity, positive feedback, and path and history dependence properties" of firms' internationalization process is limited (Cheung, Aalto, and Nevalainen (2020: 1). Historical SNA is suitable in providing a processual understanding of internationalization since it "fundamentally differs from typical models of 'variable centred sociology' (Abbott, 1988) because it examines relations and thus assumes dependence of its units of analysis" (Mutzel, 2009; 882).

Given the view of the market as a business network in which the internationalizing firm is embedded (Johanson & Vahlne, 2009), historical SNA can provide an in-depth understanding of how firms' external network structures emerge, develop and change as the internationalization process unfolds. Such approach can capture the historical path dependent nature of the process, but also how new network configurations and managerial intentions, which can be uncovered through qualitative archival records, can lead to new path creations (Hutzschenreuter, Pedersen, Volberda, 2007). Indeed, the mixed method historical SNA approach proposed in this paper can address calls for micro-foundational research on firms' internationalization (Hutzschenreuter et al., 2007). But rather than focusing on the individual decision maker as an atomistic actor, our proposed approach conceptualises actors as embedded in networks and thus relationally constituted. A relational approach rejects "the notion that one can posit discrete, pregiven units of analysis such as the individual or society as ultimate starting points of sociological analysis" and sees relations as "ongoing processes rather than as static ties among inert substances" (Emirbayer, 1997: 287). By combining qualitative archival records with SNA, we can understand "how meaning arises in a relational context and, dually, how relations create meaning" (Mutzel, 2009) and thus overcome the structural- interpretative divide in the internationalization literature.

Historical analysis also enables a linkage of the micro, meso, and macro levels of analysis through providing an in-depth understanding of the interrelations between broader economic and institutional changes, external and internal network configurations, and firm-level decisions. A recent example of historical approaches is the study by Cheung et al. (2020), in which using a historical longitudinal qualitative approach, they show how a shift in the institutional logic of Finnish state governance of state-owned enterprises has led to changes in state owned firms' dominant logic that guide their internationalisation decision-making and evaluation of international opportunities. The use of historical SNA can allow us to understand the interrelations between wider economic and institutional changes at the national and international levels and the change and reconfiguration of firms' network structures. Such approach would also address calls for research on episodes of de-internationalization (Dachs, Kinkel, & Jager, 2019) and re-internationalization (Surdu, Mellahi, Glaister, 2019) rather than assuming that the internationalization process is irreversible (Bernini et al., 2016). But such dynamics can often

be missed when the period under investigation is short and/or a cross-sectional approach is adopted (Welch & Paavilainen-Mantymaki, 2014). Historical SNA can provide the longitudinal data needed to develop a processual understanding of firm internationalization. Coupled with periodization and temporal bracketing, SNA can allow us to examine the interrelations between institutional and economic changes such as recessions (Bamiatzi et al., 2016) and disruptive events such as Brexit (Cumming & Zahra, 2016) and phases of firms' internationalization, de-internationalization, and re-internationalization. Furthermore, the qualitative analysis of archival records as suggested in our mixed methods approach would also enable researchers to examine how these macro-level changes manifest in firms-level decisions as well as the meanings that actors ascribe to these changes. This is consistent with Pettigrew's (1997) argument that explaining firms' behaviour over time requires a focus on context, content, and process (Mees-Buss, Welch, & Westney, 2019).

HQ-Subsidiary relationships: Another area where historical SNA can provide valuable contributions is the internal organization of MNE structures and HQ-subsidiary relationships (Geppert & Dörrenbächer, 2014). Using organizational evolutionary theory, Mees-Buss et al (2019) shows how during the period 2000-2012, Unilever has changed from a transnational structure to what they label as a neo-global corporation as a result of dynamic changes in the environments in which they are embedded and the organizational response to such changes. Their contributions is an example of how a longitudinal lens can provide a more granular understanding of organizational change. As they highlight, we need a better understanding of how these shifts lead to structural changes in the roles and relationships between sub-units. Historical SNA can allow us to map these changes in relationships during different temporal periods. While network analysis is central in HQ-subsidiary relationships literature (Forsgren, 2016), the use of SNA is limited (Kurt & Kurt, 2020), as well as longitudinal perspectives as the focus tend to be on analysing episodic interactions between HQ and subsidiaries. Furthermore, the focus in the HQ-Subsidiary tends to be largely "structuralist, with little understanding of how power is socially enacted and how political manoeuvring is grounded in micro-level interactions between powerful HQ and subsidiary actors" (Geppert & Dörrenbächer, 2014). By combining qualitative archival records with SNA, we can understand how meanings are created in relational contexts underpinned by power dynamics. An example of using archival research to understand HQ-Subsidiary dynamics, is the recent study by Fortwengel (2021: 1) in which they examine the evolution of a German MNE identity over 30 years by focusing on "the relational evolvement of the pair comprising headquarters and the first major foreign subsidiary".

Corporate Political Activity: Finally, another fruitful avenue for the use of historical mixed methods SNA is the corporate political activity and non-market strategy field. Corporate political activity pertains to "firms' attempts at managing their socio-political environment" (Elsahn & Benson-Rea, 2018: 774). Earlier research in this stream has focused on either the firm level by examining the antecedents and consequences of different types of non-market strategies as well as the process of non-

market strategy development (Elsahn & Benson-Rea, 2018). While another stream of research has focused on how institutional differences among countries influence firms' choices of political activities and strategies (Mbalyohere et al., 2017). Longitudinal studies that examine changes in non-market strategies over time are relatively rare. An exception is the study by Mbalyohere et al., (2017) in which they examine how MNEs utilise different political activities in response to institutional changes and transformations in the Ugandan market. What is missing from the CPA literature in IB however is an analysis of MNEs non-market network structures and how they develop and change over time and in different contexts. Historical SNA can provide an in-depth understanding of how different network configurations emerge during different periods of institutional stability and change, and the structural characteristics of these non-market network structures. Furthermore, the qualitative analysis of archival records such as correspondence can reveal the meanings actors assign to these relationships as well as their political activities such as defending, lobbying, etc.

There is clearly much scope for further research utilising this methodological approach. The possible intersections between IB, SNA and historical sources provide fruitful ground for further research into long-run SNA. As one looks further back in time, while historical sources can potentially possess gaps, they also contain much confidential and insightful evidence related to global firm network-building, intra- and interorganizational relationship in the long-run, and the intricacies of network relationships between various types of actors, including topics typically not divulged by more recent or living sources. Importantly historical SNA lends itself to a mixed method approach that makes great methodological leaps in connecting structure and meaning in network studies. While contexts certainly change, particularly within the realm of historical SNA, the motivations behind network-building and network membership remain largely the same. As such, the proposed historical SNA approach sheds critical light on temporal significance in IB, incorporates much needed methodological rigour and provides fruitful ground for redefining existing theories and creating new ones.

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