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Critical review

The operation of Global Production Networks (GPNs) 2.0 and methodological constraints

Godfrey Yeung

Department of Geography, GPN@NUS, National University of Singapore, Singapore 117570, Singapore

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ABSTRACT

The Global Production Network (GPN) 2.0 analytical framework addresses parts of the criticism of the operational limitations of the original GPN analytical framework (GPN 1.0) by proposing clearer operational guidance to unpack the specific relationships between the market environment and four actor-specific strategies adopted by lead firms and their suppliers. Due to the ambiguity of causal mechanisms and the real explanatory and dependent variables in the analytical framework, the specific setup of GPN 2.0 still demands careful research design and planning in order to identify the specific explanatory variables that are both valid and reasonably reliable for the rigorous and complex network analysis empirically required, i.e., it demands multi-scalar validity and reliability of the data, at least in the specific industry of interest for researchers.

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1. Introduction

Since the publication of the paper on apparel commodity chains in the *Journal of International Economics* in 1999 by economic sociologist, social scientists have been adopting the Global Commodity Chains (GCCs) framework to examine the roles of industrial organizations in producer-driven and buyer-driven chains. The GCCs has since been developed into the Global Value Chains (GVCs) and this paradigm really took off after the publication of Gereffi et al.'s (2005) seminal paper on the typology of value chain governance.

Notwithstanding its usefulness in reconciling spatial inequality in development, economic geographers find the 'chain' metaphor adopted in the GCC/GVC framework unsatisfactorily restrictive in its application. In addition to its narrow focus on the governance of inter-firm transactions, they argue that the linear conceptualization of the production and distribution processes in GCC/GVC overlooks the complex network structures of economic activities in the real world (Henderson et al., 2002). To address this shortcoming, they developed the Global Production Network (GPN) (GPN 1.0), which is defined as "the globally organized nexus of interconnected functions and operations by firms and non-firm institutions through which goods and services are produced and distributed" (Coe et al., 2004: 471).[1] GPN is a relational framework which

[1] The initial analytical framework of GPN (GPN 1.0) is not conceptualized as a 'toolkit'. The comments on the potential limitations on researchers that may encounter during the operation of GPN 2.0 is a timely review of the operation of GPN framework in general.

E-mail address: Geoykyg@nus.edu.sg

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conceptualizes the networking nature of the global economy as a tangled web of production circuits and networks of interconnected economic processes that are grounded and embedded in specific locations.

GPN focuses on the roles of actors and their asymmetrical power relationships in the establishment of "strategic coupling" between lead firms and their suppliers to explain the activities and performance of various types of global network configurations, which result in value creation (through labour and rents), enhancement, and retention (via market or institutional advantages), and their subsequent economic impacts in various areas.[2] This heuristic multi-actor and multi-scalar framework allows researchers to unpack complex networks with intricate links between various kinds of economic activities (Coe et al., 2008: 272).

GPN analysis focuses on the strategic coupling (economic linkages) between lead firms and their local suppliers (Henderson et al., 2002), and the empirical evidence is normally based on specific case studies, notably the BMW case outlined by Coe et al. (2004). By adopting a network ontology, this strand of the literature excels at unpacking the nuances between firm and non-firm actors in the establishment of the difficult to quantify complex production networks embedded within various socio-economic settings. The adoption of a network ontology, however, creates operational issues for researchers, specifically, its selective ontology and its potential methodological 'blind spots' of micro-scale analyses, from the selection of case studies to the incorporation of selected variables.[3]

Sunley (2008) delivers perhaps the most critical comments of GPN 1.0. By pointing out the lack of precision and problematic "selective ontology" (2008: 1–3), he criticizes the inclusive nature of GPN, which has unclear analytical boundaries and weak causal explanations. The frameworks are "defined in such an elastic manner that they can include virtually anything. One cannot escape the conclusion that such a loose and ubiquitous idea explains everything and nothing ... But if complex networks are continually changing, then it is impossible to stabilize the world to develop models of how it works" (Sunley, 2008: 8, 16). Sunley (2008: 8) further points out the overemphasis on micro-scale processes and "ties and networks", and the difficulty in validating the GPN framework empirically other than through qualitative case studies. Proponents of the GPN admit that to mitigate the potential "blind spots" of micro-scale analyses and enhance the GPN's explanatory power requires a convergence of the quantitative analyses and case study approaches (Coe et al., 2010; Coe, 2012: 390, 395).

In addition to the lack of research on intrafirm relations (including their specific internalization or externalization functions), the importance of social and environmental upgrading has been recorded (Raj-Reichert, 2013, 2015; Barrientos et al., 2011; Bolwig et al., 2010). With minimal focus on the consumption segment of the networks, the inclusive nature of GPN 1.0's analytical approach can suffer from selection bias whereby some of the most important explanatory variable(s) may not be emphasized or may even be omitted. For instance, institutional factors are generally not examined in great detail, while the linkages between the service and manufacturing sectors and their environmental externalities are largely omitted in the GPN literature, as admitted by Coe et al. (2008: 278; see also the conclusion).

[2] In GVCs, the linear structure of value-chain characteristics is the explanatory variable used to explain the governance of inter-firm networks in global industries. In the GPN analysis, actors include firm and non-firm actors (such as states, civil society, the labour market and consumers), and strategic coupling refers to the governance of contractual relationships and technological linkages between various firm and non-firm actors.

[3] Operation in this paper is defined broadly and refers to the process of specifying the extension of a concept or analytical framework.

GPN 2.0 has arguably improved on this shortcoming by specifying four groups of explanatory variables, but it is still not yet fully operational at the macro level through a quantitative analysis. A brief overview of GPN 2.0 is presented below, before a discussion of two methodological issues that hinder this framework from having a much wider use by geographers and other social scientists is outlined.

2. A brief overview of GPN 2.0

Coe and Yeung (2015) developed the GPN 2.0 to refocus the research from inter-firm relationships to intra-firm relationships. In contrast to GVCs, where the analytical focus is on a specific industrial sector or even commodities (e.g., coffee beans), GPN 2.0 focuses on lead firms (defined by the percentage size of its market share in a specific product market, not just a brand *per se*, e.g., Starbucks) and its corresponding networks, and the trajectories of value capture, enhancement and retention as well as its subsequent impact on spatial (unequal) development.

Coe and Yeung (2015) specified three aspects of competitive dynamics (namely cost-capability ratio, market imperatives, and financial discipline) plus the risk environment as the four major explanatory variables to expound four different actor-specific strategies for organizing GPNs in a competitive market scenario (Fig. 1). In GPN 2.0, the four explanatory variables are (i) the cost-capability ratio (defined as the ratio between costs and a firm's capability), (ii) market imperatives (to maximize the value capture through access to and even domination of the market), (iii) financial discipline (in the form of pressures to create value for shareholders through synergy and developing new products/markets), and (iv) the risk environment. In an uncertain market environment when financial pressure affects both firms and non-firm actors, firms react in four actor-specific strategies: (i) intra-firm coordination, (ii) inter-firm control, (iii) inter-firm partnership, and (iv) extra-firm bargaining.

To achieve a higher level of firm-specific efficiencies, lead firms together with their strategic partners and suppliers have to internalize and consolidate their value creation activities within their organizations through intra-firm coordination. Intra-firm coordination can be achieved through domestic expansion, or internalization through foreign direct investment by the lead firms, or mergers and acquisitions (M&As) initiated by lead firms with strategic partners, or specialization and in-house capacity building and/or the integration of independent suppliers, etc. (Coe and Yeung, 2015). Another strategy that lead firms could adopt is to externalize its risk by outsourcing its production to external suppliers and yet maintaining control over the production processes and the quality of the products/services through inter-firm control (Coe and Yeung, 2015: 135). This strategy is similar to the captive form of governance outlined by Gereffi et al. (2005).

To retain their competitiveness, lead firms can establish inter-firm partnerships in various forms, from collaboration, co-evolution, to joint development with strategic partners, specialized or key suppliers in the same GPN (Coe and Yeung, 2015: 142). These forms of partnership normally demand two necessary conditions: complementarities between the lead firm and its partners in terms of assets, technologies, knowledge, or market expertise as well as the existence of transparent industrial standards and codification schemes to improve the trust between the collaborating firms (Coe and Yeung, 2015). Japanese automobile manufacturers and their strategic tier-1 suppliers is one such typical example of an inter-firm partnership. To create, enhance, and capture value through the GPNs, lead firms also engage in extra-firm bargaining, which is "a contested two-way process of *negotiation* and *accommodation*" with extra-firm actors (state, NGOs, international organizations, consumers) (Coe and Yeung, 2015: 151).