

TITLE: Spurred to Upgrade: A Review of Triggers and Consequences of Industrial Upgrading
in The Global Value Chain Literature

By

Seth Pipkin*
Assistant Professor of Planning, Policy and
Design
University of California, Irvine
218E Social Ecology I
Irvine, CA 92697
spipkin@uci.edu

* Corresponding author
(949) 824-7695 (office)
(949) 824-8566 (fax)

Alberto Fuentes
Assistant Professor, Sam Nunn School of
International Affairs and School of City and
Regional Planning
Georgia Institute of Technology
781 Marietta St NW, Office 316
Atlanta GA 30332
alberto.fuentes@inta.gatech.edu

***Draft version** – please do not quote or cite without authors' permission*

ABSTRACT: The Global Value Chains (GVC) literature intervenes in today’s challenging development context by focusing on the means by which developing-country industries can ‘upgrade’ their market positions and outcomes for workers. Yet while this literature has produced hundreds of rich empirical case studies, there has to date been no attempt to systematically analyze this case literature for lessons regarding the antecedents and consequences of the key outcome of upgrading. This paper undertakes a systematic analysis of a representative sample of 45 case studies of primary product and light manufacturing industries in developing countries. These studies were coded for factors involved in initiating and sustaining upgrading processes, the results of upgrading, and the role of local institutions in these processes. We find that contrary to the major assumptions of the literature, advanced-country buyers are not the main force in the initiation of industrial upgrading. Rather, in most cases, developing-country firms initiate upgrades when pushed by “shocks” of market vulnerability, usually produced by state policies, that force them to seek to change their status quo operations. Once initiated, upgrading processes can produce a wide spectrum of results – from little to no advancement in market position (‘treadmilling’) to vaulting to the forefront of a global industry (‘leaps forward’) – on the basis of the sources of learning present in the local institutional environment, such as state agencies and business associations. We also identify conditions under which state participation in upgrading processes can lead to increased local institutional capacity. Together, these findings suggest a framework for upgrading that we refer to as an ‘induced search’ model. This model has important implications for future research on the dynamics of industrial upgrading in developing countries, techniques of state intervention, and processes of mutually-supportive learning between actors in the public and private sector.

Keywords: global value chains; industrial upgrading; industrial policy; Global South; agriculture; manufacturing

Highlights:

1. First-ever systematic review of upgrading causes and consequences in global value chains (GVC) case literature in developing countries
2. Finds that buyers are not as prevalent in initiating upgrading as state policies
3. Finds that nearly all upgrades are prompted by “vulnerability shocks” that render firms’ status quo impossible
4. Builds on observations of divergent developmental impacts of industrial upgrading by identifying extreme outcomes (“treadmilling” and “leaps forward”), their main characteristics, and sources in the local environment
5. Proposes an ‘induced search’ framework to evaluate causes and consequences of industrial upgrading among developing-country suppliers

Acknowledgements: The authors would like to acknowledge generous feedback from participants in the panel on “The Politics of The ‘Middle-Income Trap’” at the Annual Meeting of the Society for the Advancement of Socio-Economics in London 2015, as well as from Ben Schneider, two anonymous reviewers and the editors of World Development. We would like to also thank Sifat Reazi for her helpful assistance in assembling and reviewing the materials for this paper.

Introduction

The development objectives of long-term growth and improved work conditions continually encounter new difficulties. Today, countries from the Global South must attain higher productivity, wages, and quality of living for their citizens in an environment where China has become a dominant force in global manufacturing, exceeding the combined manufacturing output of Latin America, Eastern Europe, Southeast Asia, and all of Africa (United Nations 2015).¹ Moreover, many countries must do so while caught in a “middle income” trap that combines high wages and low productivity (Eichengreen et al. 2011, Paus 2012). This must take place under challenging conditions of stagnant global demand (Summers 2015) and internationally dispersed economic activity (Gereffi 1999, 2014, Gereffi and Sturgeon 2013, Antràs 2015). Furthermore, the industrial policy tools of the ‘late developing’ countries of the mid-20th century are less effective or no longer available, blocking the pathway to a classic “developmental state” model and prompting searches for piecemeal, experimental solutions (Ó Riain 2000 Pack and Saggi 2006, Whittaker et al. 2010, Andrews et al. 2013, Rodrik 2016).

The nature of these challenges speaks strongly to the literature known as global value chains (GVCs). This literature has long been focused on possibilities for “high road” development under conditions of globalized, market-driven competition (Gereffi 1999, Humphrey and Schmitz 2002, Gereffi et al. 2005). It is well known for its extensive, in-depth case studies, which span across agricultural, manufacturing and service sectors. These case studies explore the developmental prospects of different industries in all regions of the Global South, focusing on local suppliers enmeshed in international buyer-led networks. Central to their discussions is the concept of upgrading, which, while evolving over time, generally refers to the constellation of ways in which firms can enhance their competitiveness through investments in

productivity, specialization, and knowledge-intensity (Gereffi 1999, Humphrey and Schmitz 2002, Pietrobelli and Rabellotti 2006). Upgrading allows these suppliers to improve both their position in the international division of labor, as well as conditions for their workers.

Yet despite the accumulation of hundreds, if not thousands of GVC case studies over the last twenty or so years, there has been to date, somewhat surprisingly, scant synthesis of the rich body of empirical findings. Such a synthesis would help establish common patterns of greater external validity which could, in turn, contribute to some of the broader and more pressing questions in the international development research agenda. Given this gap, as well as the wealth of empirical information available, in this paper we undertake the first systematic analysis of the sources, forms and consequences of industrial upgrading in agricultural and light manufacturing value chains in the Global South. Our goal is to better understand what the empirical case literature has to tell us about how countries and regions can overcome the new global challenges.

The systematic review centers on three main themes: (1) the triggers of processes of upgrading; (2) the developmental consequences of upgrading for studied industries; and (3) the manner in which local institutions, especially but not exclusively the agencies of the state, factor into processes of upgrading. Findings were induced from the review of 39 separate documents involving 45 agricultural and light-manufacturing industry case studies across the different regions of the Global South.

Our central findings speak to each of these three themes. First, buyers often assume a relatively peripheral role in triggering upgrading, insofar as other factors, such as state policies, more frequently trigger upgrades by creating sources of pressure that render status quo production outputs and/or processes unviable, a phenomenon we refer to as “vulnerability.” These conditions of vulnerability pressure firms to search for alternative processes and/or

outputs, and may, under certain conditions explored in this article, elicit new, innovative solutions. Their analysis can help to calibrate both the extent and the direction of such searches, suggesting that they are central to processes of economic change in developing countries.

Second, in terms of the developmental consequences of upgrading for the studied industries, we find confirming evidence of some of the more skeptical views of the participation in global value chains by observing a wide range of variation in benefits to developing-country firms (Kaplinsky 2000, Schrank 2004, Gibbon and Ponte 2005, Dussel Peters 2008). The data assembled display a great deal of variation in terms of the observed developmental returns to upgrading, at the poles of which are two very different scenarios: “leaps forward,” in which searches led firms and industries to engage in comprehensive reforms to their business models, launching them to the forefront of their value chains; and “treadmilling,” involving upgrades that were followed by backsliding, decay and obsolescence. Leaps forward appeared to be most commonly associated with industries that experienced a high number of shocks, in countries with significant state institutional capacity to respond to that vulnerability. By contrast, treadmilling often arose as a product of high buyer dependence, low local institutional capacity (both of the state and other societal actors such as business associations), outsourcing of knowledge-intensive activities, and adoption of easily imitable upgrades. By leveraging the existing case literature to reveal in greater detail the range of variation involved, as well as the detailed historical data accompanying these observations, this study adds to the literature’s understanding of what factors affect the developmental returns to upgrading, - one of the areas identified as most in need of further examination (Rossi 2013, Yeung and Coe 2015). This also facilitates the introduction of several propositions regarding the local factors determining benefits to suppliers in the Global South that can be tested and expanded upon in future research.

This brings us to the final theme of our analysis: if the state's institutional capacity is central to the triggers and consequences of upgrading, how can it be better integrated into value chain analysis? In particular, in a twenty-first century context in which the pathways to the classic implementation of developmental states seem blocked, what is the relationship between value chains and local institutional capacity? Our analysis suggests that state bureaucracies often learned and enhanced their institutional capacity when their interventions augmented, and offered targeted responses to, existing vulnerability shocks. In addition, however, state learning also hinged on the extent and, especially, the type of previous state experience and inherited capacity. Unsurprisingly, states with a higher degree of experience often proved more adept at shepherding processes of industrial upgrading. But unexpectedly, not all types of inherited capacity were conducive to similar results – in a few cases, past approaches emerged as poor guides for emerging problems, producing rigidities that undermined efforts to adapt to changing environments.

The integration of these empirical findings recommends a framework more centered on what rouses developing country suppliers to take new action and how their efforts are supported by their local institutional environments than what can be currently found in the literature. Based on the evidence assembled for this review, we propose an 'induced search' framework for upgrading from the perspective of supplier firms in developing countries. Rather than focus primarily on the perspective of buyers and the governance structures over which they preside, the proposed approach centers the analysis on supplier firms and their learning contexts. It prioritizes vulnerability and local institutional environments, a level of analysis long observed empirically but less effectively integrated into theory (Bair 2005, Dussel Peters 2008, Dallas 2014). The approach is compatible with existing analyses centered on governance, insofar as part of

developing country suppliers' institutional environment is constituted by value chain governance structures.

Such an approach focused on the learning environments of suppliers has several noteworthy implications for future research as well as policy practice. First, it deepens our understanding of the local determinants of the initiation and pursuit of successful upgrading efforts (i.e. "leapfrogging") in ways that enhance the integration of power asymmetries and local constraints, a signal contribution of the literature (Neilson 2014, Werner et al. 2014). Second, this framework highlights opportunities for developing countries to advance in a post-China, post-crisis global economy, whether by learning to meet challenging international standards, capturing unique sources of demand, and/or learning to customize output efficiently. And finally, an induced search approach helps us to better understand the role of the state in a "post-developmental state" era (Pack and Saggi 2006, Whittaker et al. 2010). It does so by identifying value chain market signals that can be responded to with local means, and by specifying how value chain interventions can be a source of improvement in institutional capacity.

To develop these contributions, this paper is organized in the following manner: first a review of the key issues in the literature regarding the antecedents and consequences of industrial upgrading processes establishes the motivation to undertake a systematic review to integrate the vast array of empirical findings in the literature into theory. This is followed by a methods section explaining the data collection and analysis procedures, as well as possible biases in the research design. Following this, the analysis sections explain the main trends observed with illustrative examples from case studies. Finally, we conclude with a discussion of the implications of the findings, which we draw together into an overall 'induced search' model, for future research on global value chains and industrial policy.

Literature Review

The nature of the challenges developing countries face to compete globally resonate strongly with the literature known as global value chains.ⁱⁱ (Gereffi 1999, Cattaneo et al. 2010, Elms and Low 2013, Neilson et al. 2014). This literature has amassed a sizeable case literature over the last twenty years documenting the conditions affecting pathways to so-called high-road development in the Global South, which in broad terms refers to gaining competitiveness through increasing skills and value-added, as opposed to cost-cutting through wage suppression and deregulation (Harrison 1997, Gereffi 1999, Stiglitz 2000). Much of the GVC literature's attention focuses on the outcome of industrial "upgrading" – itself largely taken to mean an act of engaging in high-road competitiveness – as it is impacted by the "governance" structure, as defined by global buyers, which divides labor across sites of production in a value chain.

The literature's basic take on these concepts and their relationship is exemplified by the archetypal case of East Asian apparel and textile firms of Hong Kong, Taiwan, South Korea and Singapore (Gereffi 1999).ⁱⁱⁱ These industries underwent major industrial upgrades as they shifted from a focus on assembly production (e.g. cutting and sewing), to surrounding traditional production with an array of risk- and knowledge-intensive coordinating and design tasks – a suite often referred to as "full-package" production. Ultimately these firms became capable of designing and marketing their own clothing brands and established a noteworthy model of high-road development in the absence of heavily state-centric strategies of the mid-20th century (ibid:40, 52). This basic definition of upgrading posits that the market value of the function(s) performed by a firm in the value chain are an accurate indicator of its overall adoption of a developmental "high road."

This definition continues to show broad use within the literature (Morrison et al. 2008, Gereffi 2014), even as more scholars are questioning its adequacy. Such a process of upgrading has been of central concern since the advent of the value chain framework, and its importance has only become more accentuated. The presumed value of shifts into higher-skill and or –value activities is frequently undermined because of the rapid pace of competition in global value chain production, in which prices decrease as technologies and competencies diffuse and are replicated or spun off by buyers onto their suppliers (Kaplinsky 2000, Ponte and Ewert 2009, Tokatli 2013). Thus, for example, the “full-package” production that accompanied East Asian apparel firms’ rise does not take long to become a minimum standard for market entry elsewhere, with razor-thin margins and widespread replication (Schrank 2004, Dussel Peters 2008).

Only when firms create unique market niches by mastering innovations in product design, production processes, and marketing are they able to extract rents sufficient to finance sustained high-road development (Dedrick et al. 2010, Pisano and Shih 2009). In keeping with these findings, we set out to differentiate between upgrading outcomes associated with greater versus less developmental impacts. The evidence presented here suggests that it is necessary to build on existing definitions of upgrading by taking the prevalence of the capabilities involved into account. Indeed, the instances of upgrading examined in this study can occur along the axes of the widely-adopted typology proposed by Humphrey and Schmitz (2002), in which firms can increase their capabilities in terms of the value and sophistication of the products they sell (product upgrading), the technology, quality, productivity and/or standards of the methods used to produce them (process upgrading), the functions within a given process that they perform (functional upgrading), or, finally, the mix of different products that they sell (inter-chain upgrading). Yet, in the industry-level case studies collected for this systematic review, what also

frequently came to the fore was that in some cases firms were adopting activities rarely displayed by their competitors, whereas other upgrades comprised functions that were widespread in the industry. In particular, the number of new activities undertaken, taken in conjunction with their prevalence among competitors, as well as the demonstrated ability of these capacities to attract multiple buyers, are all indicators of the developmental value of an upgrade over and above its market price and skill content. By taking these other indicators into account, we are able to scrutinize the antecedents, as well as developmental consequences, along a spectrum of upgrading. This differentiation between instances of upgrading based on the number of new activities undertaken, as well as their prevalence, and the identification of a multiplicity of sources of demand for them tracks closely to the concept of “proprietary knowledge-based assets” – that is, skills not generally held by a firm’s competitor that allow it to extract extra rents through buyers’ recognition of the value of these firm-specific capacities (Teece 1998, Amsden 2001). This concept is helpful insofar as it adds specific consideration to whether and how one or more upgrades positions a firm or industry in more beneficial, and less easily-imitated competitive niches, an issue that has been a source of debate in the literature and which figures importantly in our systematic review of its case studies.

Along with definitions of upgrading, most of the GVC literature’s assumptions about its causes have, at least at the level of theoretical frameworks, remained unchanged since the mid-1990s, assuming that the lion’s share of the motive force determining developing country suppliers’ upgrades originates from powerful buyer firms based in advanced countries (Ponte and Ewert 2009:1638, Tokatli 2013:1001-02, Yeung and Coe 2015).^{iv} However, while the literature has evolved in response to different challenges – for example, the implications of evolving forms of global competition (Sturgeon 2001, Appelbaum 2008, Gereffi 2014), and the theory and

dynamics of local industrial agglomerations or “clusters” (Humphrey and Schmitz 2002, Pietrobelli and Rabellotti 2006) – at least four central problems remain, all of which we address in our systematic review. First, there has been little synthesis across this vast array of case studies. This is a limitation that scholars cite as an impediment to further theoretical development and external validity in general for the literature (Gibbon et al. 2008, Dussel Peters 2008).

Second, disagreements surround the role of global buyers and the mechanisms of learning. For one, a number of scholars note that, though ostensibly addressing upgrading in developing countries, most research on value chains focuses instead on “governance” as a matter of how global buyers organize the division of labor in internationalized production. By privileging buyer-centered accounts, this research marginalizes or leaves out altogether the impacts of developing-country suppliers and their local environments on upgrading processes (Bair 2005, Gibbon et al. 2008, Selwyn 2008, Dallas 2014). Furthermore, deep disagreements persist about whether, and when, global buyers assist versus impede developing-country firms in their efforts to advance toward more sophisticated knowledge and higher value-added (Humphrey and Schmitz 2002, Bair 2005, Ponte and Ewert 2009, Werner 2012). Indeed, some case-based research finds that, in apparent contradiction to the GVC framework’s basic assumptions, supplier firms in certain situations engage in more developmental upgrading when they elide foreign buyers altogether and convene their own value chains in local markets (Pickles et al. 2006, Pickles and Smith 2011, Kaplinsky and Farooki 2011).

Third, scholars have introduced a number of questions regarding the developmental consequences of industrial upgrading, including their distributive impacts and enduring qualities. In general, the basic GVC model assumes a fairly linear, additive, and positive relationship between each individual upgrade and the developmental trajectories of developing-country firms,

their employees and surrounding communities. However, persistent questions remain regarding the relationship between successful value chain upgrading and positive impacts for workers (Barrientos et al. 2011, Milberg and Winkler 2011, Rossi 2013). Similarly, some scholars have called for more careful attention to whether the same functional capacities among firms can be achieved through different learning processes with distinct implications for high- versus low-road outcomes (Dussel Peters 2008, Pipkin 2011). Finally, when it comes to the enduring qualities of upgrades, several authors have observed that the pace of international competition in many global value chains may quickly undermine returns to transformative investments when the specific new function or capacity becomes commodified, i.e. when it diffuses to the point of its loss of any connotation of specialized skills or functions (Dolan and Humphrey 2000, Schrank 2004). Given these concerns, we also focus our systematic review on the consequences of industrial upgrading across the case literature. Case data is leveraged to bring the aforementioned aspects of exclusivity of upgrading know-how and development of proprietary knowledge-based assets to bear on our operationalization of the outcome.

Finally, a fourth issue that cuts across all of the three primary ones is the role of local context. As Gary Gereffi, one of the founders of the literature has noted, despite “potential complementarities,” the GVC literature has established virtually no engagement with other forms of analysis that focus on the role of local institutions in shaping economic change, such as those found in the “varieties of capitalism” literature (Gereffi 2005:169-170). Key institutions of interest in this study include, not only state-based regulatory and industrial policy agencies, but also business associations, universities, and other actors that might support regulation, technical learning and public goods provision. One of the main differentiating features of the overlapping literature on “global production networks” (GPN) has been to bring these institutions that are not

necessarily located within the production network itself into greater focus as they shape and are shaped by it (Henderson et al. 2002, Yeung 2009, Neilson and Pritchard 2009). Yet, this research has also struggled to theorize exactly which institutions, and which of their behaviors, are consequential for patterned effects on developing country firms and their workers (Neilson et al. 2014, Smith 2015). As Neilson et al. note, the state and local institutions are “rarely placed in the foreground, and, even more rarely, given due theoretical consideration” (Neilson et al. 2014).

In responding to calls for greater attention to local conditions, this review explores two avenues. On the one hand, in a developing country environment in which state-centric models are either unavailable or undesirable, it explores alternative possibilities of state learning, institutional capacity building and support for upgrading. On the other hand, it draws upon research from outside the normal focus of the GVC literature to examine the sources and consequences of various environmental pressures that firms often face. Both of these respond directly to Smith’s (2015) call to articulate theories of the role of state institutions in shaping value chain outcomes that move beyond specific policies and into broader models of state strategy as the product of contests among interest groups and coalitions. In particular, the analysis in this paper develops general propositions about the sources of pressure as well as some of the key actors at the local level that instigate shifts in state strategy which in turn shape the future environment for local participants in global value chains.

The examination builds on previous work in which the authors found that firms in institutional environments with oligopolistic markets and state institutions of limited capacity (Schneider 2013, Authors 201X), such as those where GVC suppliers thrive, seldom maximized by seeking constant innovation and new demand niches. Instead, they were more likely to satisfice and seek stable market niches. This “inertial” dynamic, however, was usually broken

when change-averse firms faced shocks, or conditions of vulnerability, that threatened their established practices and approaches. Under such conditions, firms tended to engage in searches for know-how on industrial upgrading. The shocks they faced could be of three types:

- *Process shocks*, which threatened the viability of a firm's production process, and could involve threats from more efficient and capable emerging competitors, new regulations in foreign or domestic markets about the standards used in production methods (e.g. environmental, law, quality), or changes in supply availability or costs
- *Product shocks*, which threatened what firms produced, and could result from a collapse of domestic and/or foreign demand due to macroeconomic shifts, changes in consumer preferences and/or regulatory structures
- *Civil society shocks*, which called into question the "social contract" between capital and labor (Stiglitz 2000) through processes that included domestic political institutions and/or civil society groups, such as social movements, organized labor, or non-governmental organizations (NGOs).

Notably, each of these shocks was associated in a patterned way with a different type of response. Thus, process shocks usually led firms to pursue changes in their production process design and productivity, and/or input costs. Product shocks, in turn, often fostered transitions into new products or product categories. Those shifts, however, were likely to entail investments that could blur the line between process and product, including those related to original product design, marketing and retailing. Finally, civil society shocks sometimes elicited a review of firm labor relations arrangements.^v Crucially, a combination of all three shocks, a condition that we dubbed "systemic vulnerability" following Doner et al. (2005), often led firms to reassess their entire business model.

Given this perspective, this review assesses whether vulnerability may constitute a possible alternative trigger of upgrading in the value chain literature. It evaluates its explanatory power – along with our assessment of the role of buyers and local suppliers, markets and institutions – across the selected cases.

A final objective of this review is to build upon the findings, drawn from an evaluation of the four aforementioned areas, to develop a common analytic framework that can be applied across cases. Such a framework, which is addressed more extensively in the Discussion section, brings the potential complexity of these “bottom up” processes (Gereffi and Fernandez-Stark 2011, Tokatli 2013) to bear on case analysis. But before that, the rules developed for gathering, coding and analyzing data to explore the different themes of this work are detailed in the methods section below.

Methodology

Systematic reviews differ from conventional literature reviews in two key respects: first, they attempt to use previous literature to answer a specific question or set of questions, rather than to establish the motivation for an inquiry (Petticrew and Roberts 2006). Second, because the analyzed data is contained in the literature itself, a systematic review must endeavor to survey the literature consistently and transparently – such that readers can understand where the data came from and why it was interpreted in a certain manner – without introducing distorting biases of selection and/or interpretation (Cooper et al 2009, Petticrew and Roberts 2006). Systematic reviews should not be confused with meta-analyses either, as the latter attempt to combine and standardize data from across different studies (e.g. separate pharmaceutical trials) in order to apply inferential analysis to the larger, combined “meta” data set.

Because we focus on the GVC case study literature, this systematic review mostly entails gathering qualitative data from across studies. The purpose is to survey observed, non-probabilistic relationships between variables (Ragin 1987), and in particular, to identify and understand with greater accuracy the variation in mechanisms leading to industrial upgrading and its developmental results. A systematic review of GVC industry case studies allows us to draw upon observations from different industries and locations to transparently assess mechanisms and processes influencing “bottom-up” industrial upgrading – that is, upgrading from the vantage point of developing country suppliers. To our knowledge, this is the first attempt to employ representative data and systematic analysis of the GVC case study literature to discern emerging patterns.

This study constitutes an analytically justifiable example of selecting on the dependent variable (i.e. cases of upgrading) for two reasons: first, as described above, the GVC literature urgently requires a better understanding of the institutional and “bottom-up” factors that shape contrasting processes and outcomes of upgrading. The fact that upgrading itself is a broad term that indicates a wide array of outcomes only underscores that this category is in need of more thorough scrutiny for its range of internal variation and the sources thereof. Thus, focusing only on cases of industries undergoing upgrading provides the necessary pool of evidence to examine variations in the patterns of upgrading and their antecedents.^{vi}

Second, our case selection and analytic choices represent an attempt to minimize possible biases by 1) stratifying the sample on key independent variables such as industry and region, and 2) deploying methods of process tracing to reveal the causal mechanisms in each case (Collier et al. 2004). On the issue of process, although we will count totals of examples of particular mechanisms and outcomes, we do not claim that these counts carry predictive power in the

statistical sense – rather, they are descriptive indicators complemented by more in-depth discussion of the mechanisms involved. Furthermore, even though some scholars have noted risks in using such “vote-counting” in ways that might flatten important differences in quality between individual studies (Graham 1995), our strict rules for inclusion and high rate of exclusion mitigate this concern.^{vii}

In this vein, our case selection and review strategy involved a number of stages designed to provide a systematic and replicable methodology, as suggested by Pittaway et al. (2004), Leseure et al. (2004) and Tranfield et al. (2003). We took the following specific steps, further outlined in Table 1:

- (1) We identified keywords on the subject based on our knowledge of the literature. These keywords included: “Global Value Chains,” “Global Commodity Chains,” “Global Production Networks,” and “Industrial Upgrading.”
- (2) We undertook an initial search on Google Scholar to assess the keywords selected. After reading abstracts for 566 documents, we concluded that these keywords provided citations that captured the types of case studies of interest.
- (3) The same keywords were employed to conduct searches in three additional search engines pertinent to the GVC case literature: EconPapers (145 articles found), Web of Science (279 articles found), and Globalvaluechains.org (96 articles found).
- (4) To ascertain that we had adequately considered the main sources for GVC case studies, we also conducted complementary searches in specific journals (i.e. World Development, Journal of Development Studies, Review of International Political Economy, and Global Networks) that serve as key outlets for publications in this literature. We only found two more cases that fulfilled our criteria.

(5) We reviewed the titles and abstracts of the 1,088 articles, chapters and books collected.

Relying upon our inclusion and exclusion criteria (see Appendix A), we reduced the number of eligible documents to 188. During this stage, we also tagged documents that, though not fulfilling our eligibility criteria, offered insights we considered relevant for our analysis (35 articles). However, though these articles provide useful illustrations, for our counts reported in tables and results, we drew exclusively from cases that fully met our inclusion criteria.

(6) We categorized the case studies of our eligible 188 documents by geographical region and industry type. We focused only on labor intensive and less technologically advanced industries in agriculture, aquaculture, cattle husbandry, mining, agro-industry and light manufacturing, since they were most relevant for countries with inertial environments. We excluded cases of more capital intensive or technologically sophisticated industries, such as electronics or auto manufacturing.

Notably, some of the documents considered contained two or more case-studies. More commonly, however, certain industries were the focus of more than one case study (e.g. 6 separate case studies focused on the Mexican textile and apparel industry; 6 on the Kenyan vegetable industry; and 7 on the Chinese textile and apparel industry). Such case study overlaps meant that we only found 103 unique industry cases in the 188 documents considered. Table 2 shows their distribution by geographical location and industry.

(7) We drew a stratified sample from our universe of 103 cases that was representative of the overall case distribution by geographical location and industry type. That sample included 39 documents containing case studies of 45 unique industries. Table 2 also compares the geographical and industry type distribution of this sample and the universe of cases.

(8) We coded the selected 39 documents according to the themes of interest: the triggers of industrial upgrading, the consequences of upgrading, and the role of local institutions as both a dependent and independent variable.

(9) We wrote the sections drawing upon the articles pertinent to each theme.

[Insert Table 1 here]

[Insert Table 2 here]

Methodological Challenges

Given the breadth and complexity of the GVC case literature, we encountered a number of methodological challenges. Four in particular deserve mention. First, as other authors observe (e.g. Kaplinsky 2000, Dolan and Humphrey 2000, Schrank 2004, Ponte and Ewert 2009, Tokatli 2013), documents varied significantly in their definitions and measurements of “upgrading.” Instances that for some authors involved remarkable cases of transformation, merely qualified as examples of marginal change for others. To grapple with this variation, we developed a distinction, further discussed in the analysis section below, between cases involving “Leaps Forward,” in which firms engaged in comprehensive reforms to their business models that launched them to the forefront of their value chains; and those limited to “Treadmilling,” entailing upgrades that were followed by backsliding, decay and obsolescence. Where a case falls on this spectrum can be assessed by several criteria – including the number of novel activities, their prevalence among competitors, as well as the identification of multiple sources of demand for these activities – that indicate the degree to which a firm or industry has developed proprietary knowledge-based assets.

Second, the large volume of articles, chapters and books foreclosed the possibility of reading all of them in detail. Instead, in our first round of review (step 5 above), we applied our

inclusion and exclusion criteria only to titles and abstracts. We then drew a stratified sample from the included documents. This procedure runs the risk of Type I and Type II errors – that is, the incorrect exclusion of cases that meet our inclusion criteria, or the incorrect inclusion of cases that fail to meet said criteria. That said, our inclusion and exclusion protocol involved detailed criteria on themes that were commonly discussed in the abstracts. We thus used the authors’ overview as a guide for the documents’ central themes, rigorously applying our inclusion/exclusion criteria. Furthermore, in instances in which review of the abstract did not provide answers regarding all inclusion and exclusion criteria, we carried out a more detailed review of the case material by examining the document’s empirical sections. As Table 1 notes, on the basis of these two steps we excluded 900 of the 1,088 eligible documents.

Third, the extent to which our case selection allows us to generalize our theoretical contributions requires attention. That is because, partly given the GVC literature’s heavy bias in favor of cases undertaking steps to upgrade, our sample includes only this type of case. And to the extent that the characteristics of cases that did not undertake any type of upgrading initiative, or failed to survive the upgrading processes, consistently deviate from those of the cases examined, the former’s exclusion may introduce bias into our conclusions. At the same time, as we have discussed above, the concept of “upgrading” is broad enough to encompass a vast diversity of cases, including instances of treading in which the benefits of upgrading have deteriorated over time, sometimes even leaving firms in a worse competitive position than before. Insofar as such outcomes may also be considered “failures” from a global value chain supplier perspective, their inclusion addresses the generalizability concern to a significant degree. It allows us to draw implications not only for cases of success (i.e. leapfrogging), but also for those that evidently miss out on the promised developmental benefits of upgrading.

Finally, we encountered a prevalent bias in the literature involving the *ex-ante* assumption that buyers are preeminently powerful and knowledgeable, and that supplier upgrading must necessarily follow signals originating from the buyer.^{viii} To address possible alternative explanations – including the proposed account focused on vulnerability – and temper this inherent bias, we fine-tuned our inclusion and exclusion criteria to ensure that only studies with sufficient case context (e.g. information regarding precursors to upgrading, upgrading processes and outcomes) as well as depth and triangulation of data (e.g. diversity of institutional perspectives represented) were included in the systematic analysis (see Appendix A). Through these and related criteria, we sampled studies that offered the evidence necessary to document alternative accounts.

Analysis

The systematic review performed for this study originated in a set of questions about the dynamics of upgrading in global value chains. We focus on middle- and low-income countries and the industries that are considered their base of comparative advantage – agriculture and light manufacturing. Within this scope we identified the following novel patterns:

Causes of upgrading:

- A vulnerability framework, in which buyers play a more peripheral role, offers a compelling account of instances when suppliers search for upgrading opportunities. In that framework, shocks not only trigger searches, but also thematically relate to search responses by suppliers, and accumulate toward systemic vulnerability.

Consequences of upgrading:

- Upgrading efforts may lead to “leapfrogging,” involving comprehensive reforms to firm business models that launch them to the forefront of their global value chains; or to the backsliding, decay and obsolescence captured by the concept of “treadmilling.” The former usually arises when firms experience a high number of shocks in contexts of significant institutional capacity, primarily of the state. That institutional capacity allows firms to pivot from vulnerability toward innovative responses. The latter, in turn, often emerge as a result of high buyer dependence, low local institutional capacity, outsourcing of knowledge-intensive activities, and adoption of easily imitable upgrades.

State institutional capacity:

- Strengthening of the institutional capacity of the state, which proves crucial for successful upgrading (leapfrogging), may occur when state interventions reinforce and address the shocks that spark conditions of vulnerability, particularly those that pertain to how firms produce and what they produce. But the degree of change in institutional capacity also hinges on the extent and, especially, the type, of previous state experience.

We discuss each finding in turn below. Jointly, these findings suggest an “induced search” framework for upgrading that focuses on vulnerability factors and search environments encompasses. This overall approach is further examined in the Discussion section.

Causes of upgrading – buyers and systemic vulnerability

A condition of vulnerability renders untenable a firm or industry’s status quo operations in terms of what they produce, how they produce it, and/or what are the relations between managers and workers. As Table 3 below shows, conditions of vulnerability operate in nearly every case analyzed in the review. Indeed, only one (Rueda and Lambin 2013) of the 45 cases that met all inclusion criteria and did not trigger any exclusion criteria involved firms electing to

upgrade without severe pressures threatening their ability to remain in business. In that case, Colombian smallholder coffee farmers adopted a Rainforest Alliance coffee certification program.

[Insert Table 3 here]

Beyond strong evidence on the prevalence of vulnerability shocks as triggers to upgrading, our review suggests that the relationship between the three types of vulnerability shocks and specific firm responses is thematic. First, “process shocks” that threaten the viability of a firm’s production process – that is, the “how” of what is being produced – appeared alone or in conjunction with other shocks in the vast majority of cases. In isolation, these types of shocks occurred in 11 cases, each time triggering a significant search for a new production process. Process shock-induced searches led to a number of responses, including the adoption of compliance systems to ensure product standards, purchase of new equipment, or finding new sources of supply for production materials. For instance, in industrial beer production in several countries in Africa, after the shock of restrictions by the Nigerian government on imports of barley in the 1980s, major producers were forced to develop local sorghum supply chains as a substitute measure. These supply chains necessitated partnerships between multinational firms, government agencies, NGOs and farmers to improve crop yield, quality, and post-harvest treatment, in some cases resulting in a doubling of average crop yields (Van Wijk and Kwakkenbos 2012).

More commonly, process shocks unfolded in conjunction with product shocks, which challenged what firms produced, and/or civil society shocks, which brought into question prevailing capital-labor relations. Regarding the former, our review identified 27 cases involving both product and process shocks. In no case did product shocks occur in isolation. In all but four

of the 27 instances of process and product upgrading, the presence of each type of shock was, as expected, associated with a thematically relevant search response. For example, in the Mexican apparel sector, product shocks in the form of domestic economic crises forced manufacturers to seek to meet demand elsewhere (product shock and response), while in the process, meeting competitive demands in a newly liberalized environment forced firms to specialize in different portions of the production process to integrate successfully into global supply chains (process shock and response) (Vera Garcia 2001, Bair and Gereffi 2001). As we will later discuss, however, while such cases illustrate initially successful adaptations to changing environments, moves such as these – especially narrower forms of specialization in industries that formerly held broader functional competencies – can be harmful in the long-run to firms’ acquisition and maintenance of knowledge-based assets.

Finally, our sample produced very few examples of civil society shocks. Those that were observed arose in concert with product and/or process shocks – including four industries that encountered “systemic vulnerability,” in which all three factors become active. The fact that civil society shocks were observed so infrequently makes it difficult to make strong conclusions about their prevalence or antecedents. But the cases do suggest that the civil society elements resulted in the search for and adoption of new institutional arrangements for training and caring for workers, including keeping child labor out of the workforce (Nadvi 2008, Lund-Thomsen et al. 2012), financing and empowering new forms of worker-owned firms (Sandoval Cabrera 2012), or complying with new labor law regimes (Zhu and Pickles 2014). These are useful starting points for further exploration of the phenomenon of domestic institutions’ development of models of the capital-labor relationship.

In surveying the landscape of shocks and corresponding searches for upgrades, two more features stand out: the sources of shocks, and exceptions to the trend of thematic relations between shocks and upgrading responses. Table 4 below specifies the types of shocks, by source, identified in case studies. A brief review of the table shows that, contrary to expectations in the GVC literature, buyers rarely prodded suppliers to upgrade: the loss of a buyer was only mentioned in two of sixty-eight named shocks. Demands for greater product value or quality by buyers that did not originate in broadly-felt industry pressures for certification also appeared only twice.

[Insert Table 4 here]

Buyers did emerge as an important carrier of demand for certifications, triggering firms' searches for change in at least eight instances. Yet, even here, similar factors originating from states proved far more prominent: more than twice the number of instances involving searches for upgrades were triggered by either the gain or loss of preferential trade benefits and/or protections, or by shifts in import standards in demand markets (including import bans). Thus, changes in trade regulations displayed a far higher frequency of influencing value chain outcomes than the immediate interactions between buyers and suppliers.

Furthermore, shifting macroeconomic conditions (either in domestic or foreign markets) and domestic regulations each appeared about as frequently as buyer firms as triggers of change in supplier firms. Overall this means that buyer firms were the proximal cause of supplier firms' upgrades in slightly under 20% of all of the observed shocks to upgrade in the sample. Given the literature's strong focus on the centrality of buyers in instigating value chain upgrading, this result comes as a surprise.

In terms of the mismatches in the thematic area of a shock and the subsequent industrial upgrading, observed in only four cases, some relate to the blurry line between shifts in the production process of the same product vs. the production of an entirely new product. Usually this occurs when consumers have high enough demand for a specific production process (e.g. shade-grown coffee, or a fair trade-certified good) that firms respond by marketing a distinct product with different prices from the ‘conventional’ version. This is not a new observation (e.g. Ponte and Ewert 2009), and how these distinctions come to be institutionalized merits further investigation in the literature.

Aside from the impact of production processes defining product categories, search-shock mismatch can also occur if other environmental factors offer a “safety valve” dissipating or easing the pressures felt by the shocked firms. For example, in Kaplinsky et al. 2002, a series of shocks deteriorated the market position of South African furniture firms. However, they failed to upgrade in response to this shock because the country’s depreciating domestic currency kept their prices competitive. In this case, the weakened currency introduced “slack,” which inhibited the shock-triggered search process. This also occurred in a handful of other cases reviewed, including Pakistani and Indian sports equipment manufacturers who resorted to wage-squeezing rather than upgrading to match competition (Lund-Thomsen et al. 2012).

“Leaps forward” in upgrading

A vulnerability perspective helps explain not only the incidence, but also the intensity of upgrading. In particular, we expect a cumulative effect of vulnerability, insofar as increased sources of vulnerability may push firms into more avenues of search for change. Moreover, we predict that the reconsideration of a business model along multiple dimensions will broaden the scope of the timespan and constituencies considered in the upgrading process. That is to say,

engaging in multiple searches due to experiencing shocks along multiple dimensions – “systemic vulnerability” – has the potential to induce changes greater than the sum of their parts among firms that successfully upgrade, conditional on the resources and support that are available in the local environment.

Our systematic analysis largely confirms the relationship between the intensity of shocks and searches for new knowledge-based assets, while also contributing some propositions regarding the relationships between types of shocks and searches. Of the surveyed cases, all of the firms and industries – seven in total – that made dramatic moves ahead by acquiring proprietary knowledge-based assets that extended the frontiers of their product sectors faced a higher number of vulnerability shocks. Some encountered systemic vulnerability, while others endured multiple threats from at least two categories. Consider for example the case of Chinese apparel firms documented in Zhu and Pickles (2014), which shifted into higher-value markets with new production processes, new products, more environmentally-sensitive production processes, own-design and branding, as well as a more highly trained and better-paid workforce. These wide-ranging, costly and risky changes were undertaken in a context of global financial crisis, currency appreciation, increased material costs, and new domestic environmental and labor regulations. Other firms and industries that leapt forward tended to face similarly broad-spectrum threats, including Brazilian footwear firms (Bazan and Navas-Aleman 2003) and Indian apparel and textile firms (Dolan and Tewari 2001, Tewari 1999, 2006, 2008). In these instances, suppliers shifted from contract production to own-brand exports to brand-specific retail outlets in advanced countries, convened their own supply chains, and/or dominated advanced-country export markets with novel product designs.

Such situations of considerable flux across a broad array of market factors are not the norm, however. They stand in stark contrast to much more commonly observed situations of one or two total vulnerability shocks. The changes resulting from these more modal scenarios may be substantial, but are unlikely to invoke the breadth of issues and attempts at reform observed in firms faced with four, five or six shocks across two or three categories who then take leaps into entirely different business models.

That said, not every industry that was visited upon by systemic vulnerability transformed themselves successfully. Their failure to revolutionize their practices appeared to largely result from environmental factors. For example, the Indian and Pakistani soccer ball manufacturers documented by Lund-Thomsen et al. (2012) faced pressures to both stem child labor, as well as severe challenges to maintain the institutions that arose for the sake of its prevention. Beyond these issues, they also encountered the advent of new competition from Chinese firms that had integrated new, labor-saving equipment. Faced with these multiple pressures, there was no evidence to suggest that the Pakistani producers were attempting significant changes to their business models. Rather, observers report these firms trying to compete by cutting wages, seemingly eroding what little slack remained, with no evidence of efforts toward a high-road response to building pressures.

Based on this evidence, two conditions appear to affect the likelihood of industrial “leaps forward” associated with high degrees of vulnerability. First, the lack of local state institutional capacity in cases such as Pakistani soccer ball producers is mirrored by the apparent abundance of it in cases where systemic vulnerability leads to leaps forward. All instances of radical progress took place in China, Brazil, Vietnam, Mexico, Turkey, or India - developing countries of large size and/or high income, all of which display well-known legacies of strong industrial

policy. State-centric import substitution regimes, workforce training and or investment in technology, and multiple levels of industry-supporting institutions (local, state and national) are frequently reported in case studies involving leaps forward. Moreover, as the following section on upgrades that fail to produce an enhanced market position (“treadmilling”) illustrates, these institutions are often absent or of low capacity when weak and/or ephemeral results to upgrading obtain.

Second, all of these cases of leaps forward took place in light manufacturing – none were in any agriculture-related industry. Although it is beyond the scope of our systematic analysis, which is intended to trace mechanisms and processes that operate across industries and countries, to attempt to fully explain this disparity, future research may be able to use a more appropriate sample to test whether the observations here hold. Focusing on the potential for leaps forward in primary products industries, it might look into whether the average scale of producers in agriculture vs. manufacturing, due to the prevalence of smallholding farmers in developing countries, might be one reason for the differences observed here. Another possible issue to investigate would be inter-industry differences in structures of intermediaries. If agricultural firms tend to have to work through more intermediaries to bring their products to market than manufacturing firms, then they may have less ability to be proactive in articulating unique demand niches that would allow them to engage in the kind of process and product innovations that are associated with leaps forward.

“Treadmilling”: Upgrading without benefits

One implicit assumption in most theory on global value chains is that instances of upgrading inherently spark virtuous cycles of high-road development. By contrast, our systematic review confirms and builds on empirical observations elsewhere which note that in

many cases, upgrading either fails to enhance firms' competitive positions or produces short-lived benefits (Kaplinsky 2000, Schrank 2004, Gibbon and Ponte 2005, Dussel Peters 2008). Furthermore, when the market advantages of upgrading are of insignificant or fleeting impact, whether other positive outcomes, such as greater learning from new buyers, necessarily follow, remains unclear. The cases analyzed in this study build on these observations with evidence suggesting that the ongoing developmental learning effects of industrial upgrading are strongly mediated by several contextual and processual factors.

Among the 45 industry cases reviewed, eighteen of those described upgrades whose benefits deteriorated over time, sometimes leaving firms in as compromised or a worse competitive position after having upgraded. Here a return to the case of Mexican apparel is illustrative. Although firms upgraded to effectively participate in more competitive global markets, following the demands of large foreign buyers led to such narrow specialization that the acquisition (and sometimes re-acquisition) of high value-added functions became much more challenging (Vera Garcia 2001), calling into question the long-term value of the initial value chain upgrades. The prevalence of agricultural versus manufacturing industries in these eighteen cases was broadly in keeping with their prevalence in the overall review – 66% in primary product sectors (versus 60% in the overall review) and 33% in manufacturing (versus 40%). They were also geographically balanced, taking place in Asia, Eastern Europe, and several Latin American and Sub-Saharan African countries.^{ix}

More generally, four main patterns emerged across cases of treadmilling. First, in many cases, a limited number of buyers narrowed avenues to upgrading and dampened the impacts from completed upgrades. High dependence on a few powerful buyers could also amplify other weaknesses of local industries. That was the case in the tomato-growing industry of Sinaloa,

Mexico, where a lack of local financing mechanisms to improve infrastructure reduced firms' ability to explore new options. Lacking finance, the smallholding tomato growers' pleas for collective action fell on the deaf ears of large growers who were ensconced in their relations with a few large American buyers (Sandoval-Cabrera 2012:248). Likewise, in Pakistani soccer ball firms, the complex structure of a multi-sector agreement to prevent child labor collapsed when Nike, a dominant buyer, decided to shift its sourcing to East Asia and handle its labor compliance on its own (Nadvi 2008).^x

Second, firms' upgrades can also be handicapped when they forego important aspects of the learning process and/or outsource high value-added functions to other firms. The latter took place in the Brazilian ceramic tile industry (Garcia and Scur 2010), which responded to increased competition by investing in practically every component of the value chain *except* the most innovation-intensive function, glazing. Rather, Brazilian firms opted to outsource these research-intensive functions to Spanish contractors. This constrained the effects of their otherwise considerable investments, which extended to new production facilities, equipment, products and production methods, and partnerships with local universities and state training agencies. Despite such intensive efforts, their market share stagnated, largely due to their failure to innovate in tile glazing (ibid:276). Such ceding of the most knowledge- and innovation-intensive aspects of production can also result from state liberalization policies. That was the case of the Mexican textile and apparel sector (Vera Garcia 2001), as well as the previously-mentioned Sinaloa tomato sector, whose previously innovative smallholding farmers lost their capacity to self-finance infrastructure after banking reform and market liberalization (Sandoval Cabrera 2012).

Third, focusing on gaining capacities that are already or will soon be widespread can similarly undermine the benefits to upgrading. For example, the Pakistani surgical instruments

industry (Nadvi and Halder 2005) overcame an initial challenge of an import ban from the United States related to product quality and production documentation issues by collectively working with their industry association to “buy in” ISO 9000 certification capacities from consultants. Subsequently, however, the widespread adoption of one key capacity only worsened competition. Ties with buyers became more tenuous and firms attempted to undercut each other on price (ibid:350).

The final pattern associated with cases of treadmilling involves the absence of institutional capacities, primarily but not exclusively of the state, to support, maintain, regulate and legitimize new firm capabilities. For instance, agro-foods industries are rife with certification systems related to health, product quality, and environmental and labor standards, which often demand exacting logistical capacity (Gibbon and Ponte 2005, Neilson and Pritchard 2009). Because the coordination required to maintain these processes is often well beyond the capacity of most firms in developing countries, local institutional support becomes critical. For example, state institutions attempting to support industries such as South African canned fruit and Malawian rice failed to establish even tenuous versions of public goods necessary for their upgrading, resulting in negative results after upgrading attempts (Kaplan and Kaplinsky 1999, Smith 2013).

In sum, between the most successful value chain upgraders and those who saw little to no market advantage after initiating change there is a great deal of difference. Much of it lies in the locally available resources and alliances encountered in the search to respond to threats to a business’s viability. Firms that took leaps forward were searching in more directions in environments with significant state institutional capacity. Firms that fared middling to worse operated in environments involving some combination of few buyers and/or low state capacity.

They tended to engage in limited aspects of the learning required to complete their desired upgrades, or they selected common upgrades that failed to set them apart from their competitors.

Moving up the causal chain: the institutional capacity of the state

The above findings show that, as part of the institutional environment, the capacity of the state, including its ability to craft supportive industrial policy, intervenes decisively in upgrading processes. Yet paradoxically, and despite the wealth of empirical case studies documenting its important role, this institutional capacity has remained under-theorized in the GVC framework (Neilson et al. 2014, Smith 2015). In this section, we draw from thirteen of the reviewed cases where authors observed increases in state capacity over the course of upgrading processes to help to address this gap. We identify some factors that influence the growing capacity of states in the Global South.

Our focus is on two prominent dimensions of state learning and capacity building: the ability to introduce and enforce regulations, and the provision of public goods. Both of these require a great deal of knowledge and ability on state agents' part to gather relevant information on both domestic capacity and foreign demand, prevent rent-seeking, and mediate effectively across complex, often conflicting interest groups. Based on the evidence from the cases reviewed, three main issues stood out as patterns.

The first key finding is that, in responding to collective firm overtures, states can improve their capacity to enact industrial policy when they offer targeted responses to existing vulnerability shocks in the value chain. Consider the example of the Ugandan fish export industry (Ponte 2002), where the Uganda's Department of Fisheries Resources (DFR) was prompted to act due to foreign bans on exports on health and safety grounds. To work with the fishing industry, DFR had to employ nearly 40 inspectors, upgrade landing sites, and help

develop two EU-approved labs for product testing. Only certified producers were allowed to export. To support these efforts, DFR focused on market-complementing sanctions and rewards that reinforced demands from the consumer markets. As Table 5 shows, similar experiences of states learning to regulate firms arose in aquaculture industries in Thailand, China, and Vietnam (Ponte et al. 2014).

[Insert Table 5 here]

If the Ugandan fish export industry case illustrates regulatory capacity-building, the Moroccan apparel industry (Cammett 2007) offers a parallel case involving capacity-enhancing efforts at public goods provision. In that instance, a state that had very limited experience with industrial policy established a large training institute in collaboration with a business association. This institute trains specialized engineers and carries out applied research in the textile and apparel industries, among other activities. Notably, as Table 5 shows, similar instances of states enhancing their industrial policy repertoires by collaboratively crafting novel contextualized goods, suited to the particular needs of industries and firms, were observed in eight other cases.

The Ugandan and Moroccan cases also illustrate how capacity-enhancing state assistance is motivated by an immediate crisis in the form of some combination of process and/or product shocks on a local industry. A focus on what the vulnerability shock is, and what are some key functional capacities that states can contribute, adds greater precision to the literature's more general recognition that states should attend to coordination challenges and market entry costs for local industries.

The second finding emerging from this subset of cases suggests that the types of successful capacity-building interventions respond to the themes of emergent market shocks in

patterned ways. The cases of regulatory responses observed were triggered by product shocks involving a failure to comply with export market standards. In these cases, firms suffered market closures, bans, increased scrutiny from importing countries, safety incidents and negative publicity, which elicited a desperate search for ways to raise standards. Those searches fostered collaboration with state bureaucrats to improve inspection and monitoring arrangements (Ponte et al 2014).

In parallel, in cases where states provided public goods, such as customized training, those industries were usually facing threats both in the form of changes in the structure of the sources of demand (product change) as well as the conditions of competition in the industry (process change). In the previously mentioned Moroccan apparel case, for instance, growing competition in the 1990s, changing consumer tastes, and the end of the Multi-Fiber agreement in 2005 increased pressures on producers, encouraging them to collaborate with the state (Cammett 2007). A comparable process occurred in the South African wine industry, where deregulation coupled with increasing quality demands sparked widespread vulnerability, leading firms and the state to collaborate in the introduction of institutional reforms modeled after the Australian experience (Cusmano et al 2010).

Yet, if the vulnerabilities reveal opportunities for targeted interventions, whether the state's response ultimately builds capacity appears to be contingent on the extent and type of previous state experience and inherited capacity. Furthermore, the available evidence suggests that while a lack of experience is surmountable with sufficient urgency and public-private engagement, prior state experience inappropriate to the problem at-hand can jeopardize the potential of the effort to build state capacity. This constitutes our third key finding.

It is logical that, all other things being equal, state actors with greater prior experience on a particular policy problem will show a greater ability to work through it successfully. This is borne out by the contrasting examples of the Bangladeshi and Thai fishing industries (Ponte et al. 2014), which, when confronted by rejection from consumer markets due to poor compliance with food and safety standards, responded differentially based on the differing experiences of local state agents. Experienced agents of the Thai state produced a much more robust response to a very similar problem to that of their less-experienced counterparts in Bangladesh. Likewise, as Tewari (1999, 2006, 2008) notes across several studies, the Indian state's legacy of intervention through import substitution industrialization (ISI) policies supplied it with sufficient expertise to selectively adapt its policies to a liberalized economy.

At the same time, a relative "blank slate" can be overcome with sufficient dedication of time and resources. This is clear from both the Moroccan textile and apparel and the Ugandan fish cases (Cammett 2007, Ponte 2007). The two show how relatively inexperienced states successfully learned to provide local industries with necessary goods to survive crises.

In contrast, Cammett (2007) and Ponte (2002) identify other industries – Tunisian textiles and Tanzanian coffee – where the *type* of previous experience mattered: though extensive, it produced rigidities that were counterproductive to developing successful adaptations to emerging problems. In Tanzania, these rigidities had to do with market-replacing tools, such as state ownership (Ponte 2002:259). In Tunisia, they were related to the state's traditional arm's length policies which, devoid of industry input, were pitched at an inappropriate scale to the problems at-hand (e.g. creating national-level institutions rather than engaging directly with industry-level problems), or slow to foster innovation, skill upgrading and firm collaboration (Cammett 2007).

In sum, the review of thirteen cases offers some preliminary insights on the process of institutional capacity building necessary for successful upgrading. Different sets of shocks may drive firms to engage with states in distinct ways in pursuit of novel industrial policies, sparking state-level problem-solving activities. But how states respond to firm overtures may also be partly conditioned by previous legacies of intervention, and by the types of inherited institutional capacities.

Discussion and Conclusion

The foregoing analysis suggests several contributions to the global value chains literature. The first addresses a need, already identified in the literature, to correct for an analytic imbalance toward the influence of advanced-nation buyers as the decisive arena in industrial upgrading outcomes (Bair 2005, Gibbon et al. 2008, Tokatli 2013, Dallas 2014). Much more common as triggers to upgrading were vulnerabilities originating from various public policies, domestic or foreign. These vulnerabilities set into motion search processes that frequently took place without a central role for buyers.

In addition, these findings on the triggers to upgrading indicate two further insights. First, they suggest that the type of vulnerability thematically relates to the search responses, with systemic vulnerability often triggering searches for entirely new business models. Thus vulnerability – in terms of what kinds of threats motivate firms to shift from a status quo into new searches for learning – merits greater attention in the literature. Indeed, the mechanism of vulnerability can complement other mechanisms, such as buyer succession (Gereffi 1999), coordination costs (Gereffi et al. 2005), and normative pressures (Gibbon et al. 2008) by focusing analytic attention on how these as well as other issues arise with the intensity necessary

to interrupt status quo firm behavior. This study's identification, based on the empirical cases, of the types of shocks and their relations to responses, complements and extends recent work by other scholars (e.g. Yeung and Coe 2015) which attempts to better theorize the activities of developing country suppliers, whose fates, along with their workers drive much of the concern for this type of analysis. Such research attempts to locate the agency exercise by developing country firms within broader processes of change in GVCs and prioritizes how these firms respond to pressures and risks. The factors discussed here, such as the characteristics of leapfrogging and treadmilling, their antecedents, and the features of more versus less successful collaborations with local institutions, form specific propositions that can be tested and elaborated upon in future research.

The second insight pertains to the central role that local institutions, especially though not exclusively the state, often play in guiding search processes. The insight departs from the finding that once vulnerability forces firms to pursue new problems, the solutions they find may diverge quite dramatically – a finding consistent with previous scholarship pointing to the need for a better understanding of the broader developmental impacts of industrial upgrading (Ponte and Ewert 2009, Barrientos et al. 2011, Pipkin 2011, Selwyn 2013). This is illustrated by the extreme variation in upgrading outcomes between 'leaps forward,' where local industries become global leaders, and 'treadmilling,' where firms remain in low-road competition despite having upgraded.

Our systematic review suggests that there are identifiable characteristics, all highly associated with the local landscape, which largely define each extreme upgrading scenario. Treadmilling commonly arose in conjunction with high buyer dependence, commonplace upgrades, outsourcing of functional learning, and low state institutional capacity. In overcoming

the constraints imposed by the first three factors, firms may benefit from high local institutional capacity. But they may also pursue other avenues, such as buyer diversification or – as our last studied theme suggests – closer engagement with the state in order to build up problem-solving capacity.

Some patterns are also apparent in the less-commonly observed cases of leaps forward. First, industries tend to leap to the forefront of competition after being bombarded by a large number of diverse vulnerability threats – often as many as four to seven as opposed to the more common scenario of one or two. This broad array of problems forces firms to re-think their business models more comprehensively than they might otherwise, underscoring the importance of *systemic* vulnerability – the synergy between multiple threats that push actors to seek change – as an analytically important class of vulnerability in global value chains.

However, and just as important, the breadth of search alone does not guarantee success, leading us back into the local institutional context. Nearly every instance of an industry leaping to the forefront of its global value chain took place in a context with well-established, high-capacity institutions – especially public institutions, but also developmental business associations, universities, and other actors that might support regulation, technical learning and public goods provision. Not only did they tend to be present in instances of productivity- and knowledge-enhancing ‘high road’ industrial upgrades, but they were also absent when upgrades failed to break firms out of a ‘low road’ dynamic.

Does this mean that industries in countries bereft of high state institutional capacity are doomed to treadmill? To this question, our findings offer some reason for optimism. The preliminary evidence suggests that, even if national states lack significant prior experience or institutional strength, increased state capacity may arise when at least two factors coincide: first,

when state interventions reinforce and address the shocks that spark conditions of vulnerability, largely because they are usually responding to the collective demands of firms. Under those conditions, the type of public-private collaborative engagement envisioned in the so-called new industrial policy literature, wherein firms and state authorities work together to solve pressing problems (Hausmann and Rodrik 2003, Cimoli et al. 2009, Sabel et al. 2012, Mazzucato 2013), is most likely to occur, as vulnerabilities push firms to overcome their distrust of the state, abandon their commitment to the status quo, and engage in effective partnerships (Evans 1997, Tandler 1998, Chibber 2003, Authors 201X).

State capacity may be further enhanced when state agents' previous work on similar problems significantly impacts their ability to help with the next one.^{xi} That finding emerged most clearly from the contrast between the Thai and Bangladeshi state actions, as they faced concerns about the safety of their respective fish products. The former, experienced in this arena, produced a much more robust response than its inexperienced counterpart (Ponte et al 2014). Furthermore, the review of cases suggests that even more important for state learning and capacity-enhancement than the extent of past experience are the characteristics of inherited institutional approaches. Indeed, the drawbacks of excessive rigidity introduced by past experiences whose lessons did not speak to the specific dynamics of GVCs was clearly evident in both the Tunisian textile and Tanzanian coffee cases (Cammett 2007, Ponte 2002).

The aforementioned findings provide the building blocks for a logical framework for assessing the causes and consequences of industrial upgrading from the perspective of developing country suppliers. This "induced search" framework of value chain analysis focuses on two main consecutive stages: vulnerability factors spurring search and local institutional contexts supporting it. Each stage involves several dynamics that impact the extent of industrial

upgrading initiatives, as well as their effectiveness in spawning developmental outcomes, most notably increased workforce productivity, skills, and the local acquisition of proprietary knowledge-based assets. To enhance future analysis, such a framework can stand alone or be considered in conjunction with existing models of value chain governance. Its main stages, factors and propositions are depicted in Figure 1 below.

[Insert Figure 1 here]

The four main findings of this study – vulnerability, treadmilling, leaps forward, and state institutional capacity – can be traced through the features of this framework. First, contingent on the level of slack of an industry, a shock often renders established aspirations unmet, eliciting searches for new models. The greater the number and intensity of shocks, the broader the search pursued by firms. And second, the search environment, encompassing the institutional capacity of the state, firm relationships with buyers, and the opportunities available for outsourcing and practice changes will influence not only the type of upgrading – whether firms achieve leaps forward or treadmill – but also the learning possibilities for the state. At a most general level, the framework is thus intended to offer a systematizing ‘roadmap’ to bring greater analytical leverage to the consideration of local institutional environments in value chain research (Bair 2005, Dussel Peters 2008, Dallas 2014, Neilson et al. 2014, Yeung and Coe 2015). Moreover, by offering an approach to responses to common value chain pressures that recognizes repeating alternations of teaching and learning between public and private actors, the framework suggests that the discrete outcome of the upgrade can be understood as part of more sustained and encompassing processes of forming state-level projects that condition local entry into GVCs (Smith 2015).

While the framework sheds light on the paths upgrades might take, and the conditions impinging upon them, its limitations should also be considered. For one, as discussed in the Methods section, the findings that inform it are drawn solely from cases of upgrading. Due to the bias inherent in the literature, case selection precludes suppliers that either failed to pursue upgrading initiatives or did not survive the process. Thus, to the extent that firms or industries operate in contexts with insufficient resources, institutions or know-how for an initial successful push to upgrade, our findings may only offer room for speculation and the possibility of future research. This limitation, however, in no way suggests that our framework is silent on the factors contributing to upgrading failure. That is because, by building on the comparison between different types of upgrading examples, it provides substantial insight into the conditions that might lead to treading, with its deteriorating benefits for suppliers and for local development. Ultimately, the empirical results and analysis introduced here should represent a fairly broad “middle” portion of the entire global value chain terrain – primary and light manufacturing industries in low- to medium-income countries of sufficient size and dynamism to attract outside scholarly attention. While there could be other biases in the cases covered by the research community, the basic geographic and industry coverage represented in the literature covers a substantial range.

Similarly, the sequential nature of the shock-and-response characteristics of this induced search framework recommends future research to test the necessity and sufficiency of different combinations of characteristics in particular upgrading scenarios. Our framework is thus simply a step in a broader agenda. Beyond contributing to research from a ‘bottom up’ perspective on industrial upgrading, this approach has the potential to help operationalize critical power dynamics in relations with foreign buyers and other possible tutors and/or public goods

providers. These are all concerns that are often lost in the translation between value chain research and policy proposals (Neilson 2014, Werner et al. 2014).

This roadmap points out future research questions as well as more immediate policy implications. In discussions of the policy implications of the GVC literature, a common tendency is to catalogue the spectrum of interventions that have shown some potential to increase the likelihood of upgrading for value chain actors (Pietrobelli and Rabellotti 2006, Humphrey and Navas-Aleman 2010, Cattaneo et al. 2010, Bamber et al. 2014, Taglioni and Winkler 2016). An induced search approach can complement these proposals by 1) sharpening the focus on how to best match policy options with local environments based on an evaluation of local shocks and their relations not just to upgrading writ large but developing proprietary knowledge-based assets, as well as 2) offering suggestions for how to work through institutional capacity bottlenecks that may be encountered along the way. These contributions are also applicable to research on industrial policy, whose integration with the GVC approach is ongoing (Gereffi and Sturgeon 2013, Taglioni and Winkler 2016). In particular, an induced search approach can help to address critiques of industrial policy as resting on obsolete models of the state based on the mid-twentieth century “East Asian tigers” (Pack and Saggi 2006, Whittaker et al. 2010) by identifying context-appropriate interventions both for firm upgrading and state capacity-building.

In closing, we should note that such a perspective offers a more positive outlook on the dire mood that has taken hold across the Global South. That is because where others see growing competition (IMF 2015) and stagnant demand (Summers 2015) as largely fixed constraints, the induced search framework suggests triggers to shocks that may spawn creativity and public-private collaboration. And where others see middle-income traps (Eichengreen et al. 2011), obsolete state policies (Pack and Saggi 2006, Whittaker et al. 2010), and increasingly dispersed

resources (Gereffi 1999, 2014, Gereffi and Sturgeon 2013, Antràs 2015), the framework casts a light on ways to more precisely discern the learning opportunities that, if addressed strategically, these novel global conditions may offer emerging economies and industries.

References

- Amsden, A. (2003). *The Rise of “The Rest”: Challenges to the West from Late-Industrializing Economies*. Oxford University Press.
- Andrews, M., Pritchett, L., & Woolcock, M. (2013). Escaping Capability Traps Through Problem Driven Iterative Adaptation (PDIA). *World Development*, 51, 234–244.
<http://doi.org/10.1016/j.worlddev.2013.05.011>
- Antràs, P. (2015). *Global Production: Firms, Contracts, and Trade Structure*. Princeton University Press.
- Appelbaum, R. P. (2008). Giant transnational contractors in East Asia: emergent trends in global supply chains. *Competition & Change*, 12(1), 69–87.
- Bair, J. (2005). Global Capitalism and Commodity Chains: Looking Back, Going Forward. *Competition & Change*, 9(2), 153–180. <http://doi.org/10.1179/102452905X45382>
- Bair, J. (2008). Analysing global economic organization: embedded networks and global chains compared. *Economy and Society*, 37(3), 339–364.
- Bair, J., & Gereffi, G. (2001). Local Clusters in Global Chains: The Causes and Consequences of Export Dynamism in Torreon’s Blue Jeans Industry. *World Development*, 29(11), 1885–1903.
[http://doi.org/10.1016/S0305-750X\(01\)00075-4](http://doi.org/10.1016/S0305-750X(01)00075-4)
- Bair, J., & Werner, M. (2011). The Place of Disarticulations: Global Commodity Production in La Laguna, Mexico. *Environment and Planning A*, 43(5), 998–1015. <http://doi.org/10.1068/a43404>

- Bamber, P., Fernandez-Stark, K., Gereffi, G., & Guinn, A. (2014). *Connecting Local Producers in Developing Countries to Regional and Global Value Chains* (OECD Trade Policy Papers). Paris: Organisation for Economic Co-operation and Development.
- Barin-Cruz, L., & Boehe, D. M. (2009). *CSR in the Global Marketplace: Towards Sustainable Global Value Chains* (SSRN Scholarly Paper No. ID 1490006). Rochester, NY: Social Science Research Network. Retrieved from <http://papers.ssrn.com/abstract=1490006>
- Barrientos, S., Gereffi, G., & Rossi, A. (2011). Economic and social upgrading in global production networks: A new paradigm for a changing world. *International Labour Review*, 150(3-4), 319–340. <http://doi.org/10.1111/j.1564-913X.2011.00119.x>
- Bazan, L., & Navas-Alemán, L. (2003). Upgrading in Global and National Value Chains: recent challenges and opportunities for the Sinos Valley footwear cluster, Brazil. Presented at the EADI Workshop “Clusters and Global Value Chains in the North and the Third World,” Novara, October 30-31, 2003. Retrieved from <http://ecoxs02.eco.unipmn.it/eventi/eadi/papers/bazannavasaleman.pdf>
- Belussi, F., & Sammarra, A. (2009). *Business Networks in Clusters and Industrial Districts: The Governance of the Global Value Chain*. Routledge.
- Biggart, N. W., & Guillén, M. F. (1999). Developing Difference: Social Organization and the Rise of the Auto Industries of South Korea, Taiwan, Spain, and Argentina. *American Sociological Review*, 64(5), 722–747. <http://doi.org/10.2307/2657373>
- Brady, H., & Collier, D. (2010). *Rethinking Social Inquiry: Diverse Tools, Shared Standards* (Second Edition edition). Lanham, MD: Rowman & Littlefield Publishers.
- Cammett, M. (2007). Business–government relations and industrial change: The politics of upgrading in Morocco and Tunisia. *World Development*, 35(11), 1889–1903.

- Chibber, V. (2003). *Locked in Place: State-Building and Late Industrialization in India*. Princeton University Press.
- Cimoli, M., Dosi, G., & Stiglitz, J. E. (2009). *Industrial policy and development: the political economy of capabilities accumulation*. Oxford; Toronto: Oxford University Press.
- Collier, D., & Mahoney, J. (1996). Insights and Pitfalls: Selection Bias in Qualitative Research. *World Politics*, 49(01), 56–91. <http://doi.org/10.1353/wp.1996.0023>
- Collier, D., Mahoney, J. L., & Seawright, J. (2004). Claiming Too Much: Warnings about Selection Bias. In H. E. Brady & D. Collier (Eds.), *Rethinking Social Inquiry: Diverse Tools, Shared Standards* (pp. 85–102). Rowman & Littlefield. Retrieved from <https://www.scholars.northwestern.edu/en/publications/claiming-too-much-warnings-about-selection-bias>
- Cooper, H., Hedges, L. V., & Valentine, J. C. (Eds.). (2009). *The Handbook of Research Synthesis and Meta-Analysis* (2nd ed. edition). New York: Russell Sage Foundation.
- Cusmano, L., Morrison, A., & Rabelotti, R. (2010). Catching up trajectories in the wine sector: A comparative study of Chile, Italy, and South Africa. *World Development*, 38(11), 1588–1602.
- Dallas, M. P. (2014). Cloth without a weaver: power, emergence and institutions across global value chains. *Economy and Society*, 43(3), 315–345. <http://doi.org/10.1080/03085147.2014.881595>
- Dedrick, J., Kraemer, K. L., & Linden, G. (2010). Who profits from innovation in global value chains?: a study of the iPod and notebook PCs. *Industrial and Corporate Change*, 19(1), 81–116. <http://doi.org/10.1093/icc/dtp032>
- Dolan, C., & Humphrey, J. (2000). Governance and Trade in Fresh Vegetables: The Impact of UK Supermarkets on the African Horticulture Industry. *The Journal of Development Studies*, 37(2), 147–176. <http://doi.org/10.1080/713600072>

- Dolan, C. S., & Tewari, M. (2001). From What We Wear to What We Eat Upgrading in Global Value Chains. *IDS Bulletin*, 32(3), 94–104. <http://doi.org/10.1111/j.1759-5436.2001.mp32003010.x>
- Doner, R. F., Ritchie, B. K., & Slater, D. (2005). Systemic Vulnerability and the Origins of Developmental States: Northeast and Southeast Asia in Comparative Perspective. *International Organization*, 59(02), 327–361. <http://doi.org/10.1017/S0020818305050113>
- Dussel Peters, E. (2008). GCCs and Development: A Conceptual and Empirical Review. *Competition & Change*, 12(1), 11–27. <http://doi.org/10.1179/102452907X264502>
- Edwards, T., & Kuruvilla, S. (2005). International HRM: national business systems, organizational politics and the international division of labour in MNCs. *The International Journal of Human Resource Management*, 16(1), 1–21.
- Eichengreen, B., Park, D., & Shin, K. (2011). *When Fast Growing Economies Slow Down: International Evidence and Implications for China* (Working Paper No. 16919). National Bureau of Economic Research.
- Elms, D. K., & Low, P. (Eds.). (2013). *Global Value Chains in a Changing World*. Geneva, Switzerland: WTO Publications.
- Esbenshade, J. L. (2009). *Monitoring Sweatshops: Workers, Consumers, and the Global Apparel Industry*. Philadelphia, PA: Temple University Press.
- Evans, P. (1995). *Embedded Autonomy*. Princeton, N.J: Princeton University Press.
- Evans, P. (1997). The Eclipse of the State? Reflections on Stateness in an Era of Globalization. *World Politics*, 50(1), 62–87. <https://doi.org/10.1017/S0043887100014726>
- Garcia, R., & Scur, G. (2009). Industrial Clusters in The Brazilian Ceramic Tile Industry and The New Challenges of The Competition in The Global Value Chain. In F. Belussi & A. Sammarra

(Eds.), *Business Networks in Clusters and Industrial Districts: The Governance of the Global Value Chain* (pp. 266–287). Routledge.

Gereffi, G. (1999). International trade and industrial upgrading in the apparel commodity chain.

Journal of International Economics, 48(1), 37–70. [http://doi.org/10.1016/S0022-1996\(98\)00075-0](http://doi.org/10.1016/S0022-1996(98)00075-0)

Gereffi, G. (2005). The Global Economy: Organization, Governance, and Development. In N. J.

Smelser & R. Swedberg (Eds.), *The Handbook of Economic Sociology* (pp. 160–82). Princeton University Press.

Gereffi, G. (2014). Global value chains in a post-Washington Consensus world. *Review of*

International Political Economy, 21(1), 9–37. <http://doi.org/10.1080/09692290.2012.756414>

Gereffi, G., & Fernandez-Stark, K. (2011). *Global Value Chain Analysis: A Primer* (Center on

Globalization, Governance and Competitiveness). Durham, NC: Duke University.

Gereffi, G., Humphrey, J., & Sturgeon, T. (2005). The governance of global value chains. *Review of*

International Political Economy, 12(1), 78–104. <http://doi.org/10.1080/09692290500049805>

Gereffi, G., & Sturgeon, T. (2013). Global Value Chains and Industrial Policy: The Role of Emerging

Economies. In D. K. Elms & P. Low (Eds.), *Global Value Chains in a Changing World* (pp.

329–360). Geneva: World Trade Organization with the Temasek Foundation and the Fung

Global Institute.

Gibbon, P., Bair, J., & Ponte, S. (2008). Governing global value chains: an introduction. *Economy*

and Society, 37(3), 315–338. <http://doi.org/10.1080/03085140802172656>

Gomes, R. (2006). Upgrading without exclusion: lessons from SMEs in fresh fruit producing clusters

in Brazil. *Upgrading to Compete: Global Value Chains, Clusters, and SMEs in Latin America*,

71–107.

- Graham, S. (1995). Narrative Versus Meta-Analytic Reviews of Race Differences in Motivation: A Comment on Cooper and Dorr. *Review of Educational Research*, 65(4), 509–514.
<http://doi.org/10.3102/00346543065004509>
- Harrison, B. (1997). *Lean and Mean: The Changing Landscape of Corporate Power in the Age of Flexibility*. Guilford Press.
- Hausmann, R., & Rodrik, D. (2003). Economic development as self-discovery. *Journal of Development Economics*, 72(2), 603–633. [https://doi.org/10.1016/S0304-3878\(03\)00124-X](https://doi.org/10.1016/S0304-3878(03)00124-X)
- Henderson, J., Dicken, P., Hess, M., Coe, N., & Yeung, H. W.-C. (2002). Global production networks and the analysis of economic development. *Review of International Political Economy*, 9(3), 436–464. <http://doi.org/10.1080/09692290210150842>
- Hirschman, A. O. (1968). The Political Economy of Import-Substituting Industrialization in Latin America. *The Quarterly Journal of Economics*, 82(1), 1–32. <http://doi.org/10.2307/1882243>
- Humphrey, J., & Schmitz, H. (2002). How does insertion in global value chains affect upgrading in industrial clusters? *Regional Studies*, 36(9), 1017–1027.
<http://doi.org/10.1080/0034340022000022198>
- Humphrey, J., & Navas-Alemán, L. (2010). Value chains, donor interventions and poverty reduction: A review of donor practice. *IDS Research Reports*, 2010(63), 1–106.
- International Monetary Fund (IMF). (2015). *World Economic Outlook: Adjusting to Lower Commodity Prices* (World Economic Outlook). Washington, D.C.: International Monetary Fund.
Retrieved from <https://www.imf.org/external/pubs/ft/weo/2015/02/pdf/text.pdf>
- Kaplan, D., & Kaplinsky, R. (1999). Trade and Industrial Policy on an Uneven Playing Field: The Case of the Deciduous Fruit Canning Industry in South Africa. *World Development*, 27(10), 1787–1801. [http://doi.org/10.1016/S0305-750X\(99\)00085-6](http://doi.org/10.1016/S0305-750X(99)00085-6)

- Kaplinsky, R., & Farooki, M. (2011). What are the implications for global value chains when the market shifts from the north to the south? *International Journal of Technological Learning, Innovation and Development*, 4(1-3), 13–38. <http://doi.org/10.1504/IJTLID.2011.041898>
- Kaplinsky, R., Morris, M., & Readman, J. (2002). The Globalization of Product Markets and Immiserizing Growth: Lessons From the South African Furniture Industry. *World Development*, 30(7), 1159–1177.
- Kaplinsky, R., Terheggen, A., & Tijaja, J. (2011). China as a final market: The Gabon timber and Thai cassava value chains. *World Development*, 39(7), 1177–1190.
- Kenta, G. (2007). *Industrial Upgrading of the Vietnamese Garment Industry: An Analysis from the Global Value Chains Perspective*. RCAPS Working Paper.
- Leseure, M. J., Bauer, J., Birdi, K., Neely, A., & Denyer, D. (2004). Adoption of promising practices: a systematic review of the evidence. *International Journal of Management Reviews*, 5-6(3-4), 169–190. <http://doi.org/10.1111/j.1460-8545.2004.00102.x>
- Locke, R. M. (2013). *The Promise and Limits of Private Power: Promoting Labor Standards in a Global Economy*. New York, NY: Cambridge University Press.
- Lund-Thomsen, P., Nadvi, K., Chan, A., Khara, N., & Xue, H. (2012). Labour in global value chains: Work conditions in football manufacturing in China, India and Pakistan. *Development and Change*, 43(6), 1211–1237.
- Mazzucato, M. (2013). *The Entrepreneurial State: Debunking Public vs. Private Sector Myths*. London: Anthem Press.
- McDermott, G. A. (2007). The politics of institutional renovation and economic upgrading: Recombining the vines that bind in Argentina. *Politics & Society*, 35(1), 103–144.

- Milberg, W., & Winkler, D. (2011). Economic and social upgrading in global production networks: Problems of theory and measurement. *International Labour Review*, 150(3-4), 341–365.
<http://doi.org/10.1111/j.1564-913X.2011.00120.x>
- Morris, M., & Staritz, C. (2014). Industrialization Trajectories in Madagascar's Export Apparel Industry: Ownership, Embeddedness, Markets, and Upgrading. *World Development*, 56(C), 243–257.
- Moyer-Lee, J., & Prowse, M. (2012). *How traceability is restructuring Malawi's tobacco industry* (IOB Working Paper No. 2012.05). Universiteit Antwerpen, Institute of Development Policy and Management (IOB).
- Nadvi, K. (2008). Global standards, global governance and the organization of global value chains. *Journal of Economic Geography*, 8(3), 323–343. <http://doi.org/10.1093/jeg/lbn003>
- Nadvi, K., & Halder, G. (2005). Local clusters in global value chains: exploring dynamic linkages between Germany and Pakistan. *Entrepreneurship & Regional Development*, 17(5), 339–363.
<http://doi.org/10.1080/08985620500247785>
- Nadvi, K., Thoburn, J., Thang, B. T., Ha, N. T. T., Hoa, N. T., & Le, D. H. (2004). Challenges to Vietnamese firms in the world garment and textile value chain, and the implications for alleviating poverty. *Journal of the Asia Pacific Economy*, 9(2), 249–267.
- Navas-Alemán, L. (2011). The Impact of Operating in Multiple Value Chains for Upgrading: The Case of the Brazilian Furniture and Footwear Industries. *World Development*, 39(8), 1386–1397.
<http://doi.org/10.1016/j.worlddev.2010.12.016>
- Neilson, J., & Pritchard, B. (2009). *Value Chain Struggles: Institutions and Governance in the Plantation Districts of South India*. John Wiley & Sons.

- Neilson, J. (2014). Value chains, neoliberalism and development practice: The Indonesian experience. *Review of International Political Economy*, 21(1), 38–69.
<http://doi.org/10.1080/09692290.2013.809782>
- Ó Riain, S. (2000). The flexible developmental state: globalization, information technology and the “Celtic Tiger.” *Politics and Society*, 28(2), 157–193.
- Pack, H., & Saggi, K. (2006). Is There a Case for Industrial Policy? A Critical Survey. *The World Bank Research Observer*, 21(2), 267–297. <http://doi.org/10.1093/wbro/lkl001>
- Paus, E. (2012). Confronting the Middle Income Trap: Insights from Small Latecomers. *Studies in Comparative International Development*, 47(2), 115–138. <http://doi.org/10.1007/s12116-012-9110-y>
- Perez-Aleman, P. (2013). Regulation in the Process of Building Capabilities: Strengthening Competitiveness While Improving Food Safety and Environmental Sustainability in Nicaragua. *Politics & Society*, 41(4), 589–620. <http://doi.org/10.1177/0032329213507553>
- Petticrew, M., & Roberts, H. (2006). *Systematic Reviews in the Social Sciences: A Practical Guide*. Malden, MA: Blackwell Publishing. Retrieved from
<http://www.wiley.com/WileyCDA/WileyTitle/productCd-1405121106.html>
- Pickles, J., & Smith, A. (2011). Delocalization and Persistence in the European Clothing Industry: The Reconfiguration of Trade and Production Networks. *Regional Studies*, 45(2), 167–185.
- Pickles, J., Smith, A., Bucěk, M., Roukova, P., & Begg, R. (2006). Upgrading, changing competitive pressures, and diverse practices in the East and Central European apparel industry. *Environment and Planning A*, 38(12), 2305 – 2324. <http://doi.org/10.1068/a38259>

- Pietrobelli, C., & Rabellotti, R. (2006). Clusters and value chains in Latin America: In search of an integrated approach. *Upgrading to Compete: Global Value Chains, Clusters, and SMEs in Latin America*, 1–40.
- Pipkin, S. (2011). Local means in value chain ends: dynamics of product and social upgrading in apparel manufacturing in Guatemala and Colombia. *World Development*, 39(12), 2119–2131.
- Pisano, G. P., & Shih, W. C. (2009, August). Restoring American Competitiveness. *Harvard Business Review*.
- Pittaway, L., Robertson, M., Munir, K., Denyer, D., & Neely, A. (2004). Networking and innovation: a systematic review of the evidence. *International Journal of Management Reviews*, 5-6(3-4), 137–168. <http://doi.org/10.1111/j.1460-8545.2004.00101.x>
- Ponte, S. (2002). Brewing a Bitter Cup? Deregulation, Quality and the Re-organization of Coffee Marketing in East Africa. *Journal of Agrarian Change*, 2(2), 248–272.
- Ponte, S. (2007). Bans, tests, and alchemy: Food safety regulation and the Uganda fish export industry. *Agriculture and Human Values*, 24(2), 179–193.
- Ponte, S., & Ewert, J. (2009). Which Way is “Up” in Upgrading? Trajectories of Change in the Value Chain for South African Wine. *World Development*, 37(10), 1637–1650.
- Ponte, S., & Gibbon, P. (2005). Quality standards, conventions and the governance of global value chains. *Economy and Society*, 34(1), 1–31. <http://doi.org/10.1080/0308514042000329315>
- Ponte, S., Kelling, I., Jespersen, K. S., & Kruijssen, F. (2014). The Blue Revolution in Asia: Upgrading and Governance in Aquaculture Value Chains. *World Development*, 64, 52–64. <http://doi.org/10.1016/j.worlddev.2014.05.022>
- Rainbird, H., & Ramirez, P. (2012). Bringing social institutions into global value chain analysis: the case of salmon farming in Chile. *Work, Employment & Society*, 26(5), 789–805.

- Riisgaard, L. (2009). Global Value Chains, Labor Organization and Private Social Standards: Lessons from East African Cut Flower Industries. *World Development*, 37(2), 326–340.
<http://doi.org/10.1016/j.worlddev.2008.03.003>
- Rodrik, D. (2015). Premature deindustrialization. *Journal of Economic Growth*, 21(1), 1–33.
<http://doi.org/10.1007/s10887-015-9122-3>
- Rossi, A. (2013). Does Economic Upgrading Lead to Social Upgrading in Global Production Networks? Evidence from Morocco. *World Development*, 46, 223–233.
<http://doi.org/10.1016/j.worlddev.2013.02.002>
- Rueda, X., & Lambin, E. F. (2013). Responding to Globalization: Impacts of Certification on Colombian Small-Scale Coffee Growers. *Ecology and Society*, 18(3). <http://doi.org/10.5751/ES-05595-180321>
- Sabel, C., Fernandez-Arias, E., Hausmann, R., Rodriguez-Clare, A., & Stein, E. (2012). *Export Pioneers in Latin America* (SSRN Scholarly Paper No. ID 2080388). Rochester, NY: Social Science Research Network. Retrieved from <http://papers.ssrn.com/abstract=2080388>
- Sandoval Cabrera, S. V. (2012). Condiciones histórico-estructurales de los productores de hortalizas sinaloenses en la cadena de valor, 1900-2010. *Región Y Sociedad*, 24(54), 231–259.
- Schneider, B. R. (1998). Elusive Synergy: Business-Government Relations and Development. *Comparative Politics*, 31(1), 101–122. <http://doi.org/10.2307/422108>
- Schneider, B. R. (2013). *Hierarchical Capitalism in Latin America: Business, Labor, and the Challenges of Equitable Development*. Cambridge University Press.
- Schrank, A. (2004). Ready-to-Wear Development? Foreign Investment, Technology Transfer, and Learning by Watching in the Apparel Trade. *Social Forces*, 83(1), 123–156.
<http://doi.org/10.1353/sof.2004.0126>

- Schuster, M., & Maertens, M. (2015). The Impact of Private Food Standards on Developing Countries' Export Performance: An Analysis of Asparagus Firms in Peru. *World Development*, 66(C), 208–221.
- Selwyn, B. (2008). Institutions, Upgrading and Development: Evidence From North East Brazilian Export Horticulture. *Competition & Change*, 12(4), 377–396.
<http://doi.org/10.1179/102452908X357310>
- Singh, S. (2013). *Governance and upgrading in export grape global production networks in India* (Brooks World Poverty Institute Working Paper Series). BWPI, The University of Manchester.
- Smith, A. (2015). The state, institutional frameworks and the dynamics of capital in global production networks. *Progress in Human Geography*, 39(3), 290–315.
<https://doi.org/10.1177/0309132513518292>
- Smith, A. M. (2013). Fair trade governance and diversification: The experience of the National Smallholder Farmers' Association of Malawi. *Geoforum*, 48, 114–125.
<http://doi.org/10.1016/j.geoforum.2013.04.020>
- Staritz, C., & Morris, M. (2013). *Local Embeddedness, Upgrading and Skill Development: Global Value Chains and Foreign Direct Investment in Lesotho's Apparel Industry* (SSRN Scholarly Paper No. ID 2237488). Rochester, NY: Social Science Research Network.
- Stiglitz, J. E. (2000). Democratic Development as the Fruits of Labor. *Perspectives on Work*, 4(1), 31–37.
- Sturgeon, T. J. (2001). How Do We Define Value Chains and Production Networks?. *IDS Bulletin*, 32(3), 9–18. <http://doi.org/10.1111/j.1759-5436.2001.mp32003002.x>
- Summers, L. (2015). Demand Side Secular Stagnation. *American Economic Review*, 105(5), 60–65.

- Taglioni, D., & Winkler, D. (2016). *Making global value chains work for development* (No. 88053) (pp. 1–10). The World Bank.
- Teece, D. J. (1998). Capturing Value from Knowledge Assets: The New Economy, Markets for Know-How, and Intangible Assets. *California Management Review*, 40(3), 55–79.
<http://doi.org/10.2307/41165943>
- Tendler, J. (1998). *Good Government in the Tropics*. The Johns Hopkins University Press.
- Tewari, M. (1999). Successful Adjustment in Indian Industry: the Case of Ludhiana's Woolen Knitwear Cluster. *World Development*, 27(9), 1651–1671. [http://doi.org/10.1016/S0305-750X\(99\)00079-0](http://doi.org/10.1016/S0305-750X(99)00079-0)
- Tewari, M. (2006). Adjustment in India's textile and apparel industry: reworking historical legacies in a post-MFA world. *Environment and Planning A*, 38(12), 2325 – 2344.
<http://doi.org/10.1068/a38279>
- Tewari, M. (2008). Varieties of global integration: navigating institutional legacies and global networks in India's garment industry. *Competition & Change*, 12(1), 49–67.
- Tijaja, J., & Faisal, M. (2014). *Industrial Policy in Indonesia: A Global Value Chain Perspective* (ADB Economics Working Paper Series No. 411). Asian Development Bank.
- Tokatli, N. (2013). Toward a better understanding of the apparel industry: a critique of the upgrading literature. *Journal of Economic Geography*, 13(6), 993–1011. <http://doi.org/10.1093/jeg/lbs043>
- Tranfield, D., Denyer, D., & Smart, P. (2003). Towards a Methodology for Developing Evidence-Informed Management Knowledge by Means of Systematic Review. *British Journal of Management*, 14(3), 207–222. <http://doi.org/10.1111/1467-8551.00375>

- T. Song Hanh, P. (2009). *An Explorative Study on Functional Upgrading and Export Development of Vietnam Wood Furniture Producers* (Working Paper No. 07). Development and Policies Research Center (DEPOCEN), Vietnam.
- United Nations Statistics Division. (2015). *National Accounts Main Aggregates Database*. Retrieved from <http://unstats.un.org/unsd/snaama/resQuery.asp>
- van Wijk, J., & Kwakkenbos, H. (2012). Beer multinationals supporting Africa's development? In M. Van Dijk & J. Trienekens (Eds.), *Promoting Sustainable Global Value Chains: The Role of Governance* (pp. 71–88). Amsterdam: Amsterdam University Press.
- Vera Garcia, J. (2001). *From globalisation to upgrading value in the productive chain in specialised agglomerations: Is local space still important? Evidence From Mexico* (ERSA conference paper). European Regional Science Association.
- Vogel, D. (2006). *The Market for Virtue: The Potential and Limits of Corporate Social Responsibility* (2nd ed.). Princeton, NJ: Brookings Institution Press.
- Werner, M. (2012). Beyond Upgrading: Gendered Labor and the Restructuring of Firms in the Dominican Republic. *Economic Geography*, 88(4), 403–422. <http://doi.org/10.1111/j.1944-8287.2012.01163.x>
- Werner, M., Bair, J., & Fernández, V. R. (2014). Linking Up to Development? Global Value Chains and the Making of a Post-Washington Consensus. *Development and Change*, 45(6), 1219–1247.
- Whittaker, D. H., Zhu, T., Sturgeon, T., Tsai, M. H., & Okita, T. (2010). Compressed development. *Studies in Comparative International Development*, 45(4), 439–467.
- Yeung, H. W. (2009). Regional Development and the Competitive Dynamics of Global Production Networks: An East Asian Perspective. *Regional Studies*, 43(3), 325–351. <https://doi.org/10.1080/00343400902777059>

Yeung, H. W., & Coe, N. M. (2015). Toward a Dynamic Theory of Global Production Networks. *Economic Geography*, 91(1), 29–58. <https://doi.org/10.1111/ecge.12063>

Zhu, S., & Pickles, J. (2014). Bring in, go up, go west, go out: Upgrading, regionalisation and delocalisation in China's apparel production networks. *Journal of Contemporary Asia*, 44(1), 36–63.

Zylberberg, E. (2013). Bloom or bust? A global value chain approach to smallholder flower production in Kenya. *Journal of Agribusiness in Developing and Emerging Economies*, 3(1), 4–26.

ⁱ 2014 manufacturing output in nominal US dollars was over \$2.9 trillion in China, and just under \$2.1 trillion for Latin America, Eastern Europe, Southeast Asia, and Africa combined (United Nations 2015).

ⁱⁱ For the purposes of this study we will use this term interchangeably with “global commodity chains” and “global production networks.” Although there are principled reasons to maintain distinctions of terminology (for example see Henderson et al. 2002, Bair 2005, 2008), the scope of our investigation encompasses studies that embrace each of the three perspectives.

ⁱⁱⁱ In Gereffi's original model (1999), there are two ideal types of value chain: buyer- and producer-driven. Both have lead firms that do the “driving,” or shape the governance and division of labor of the value chain. In this paper, the value chains we study are almost entirely “buyer-driven,” which tends to be the most prevalent in the industries considered in this review.

^{iv} Although it is possible for developing-country firms to participate in less buyer-driven value chains, these are widely observed to be by far the most prevalent form of participation for companies in developing countries (Humphrey and Sturgeon 2002, Gereffi et al. 2005). Because our empirical focus draws from this observation to focus on buyer-driven value chains, we focus our inquiry and discussion on the role of buyers in these governance structures. That said, considering these types of value chains involve some of the highest levels of buyer power, the observations resulting from this study could be said to raise broader questions about the role of buyers in general, even though the scope of the immediate empirical claims made possible by our sample remain squarely within buyer-driven value chain governance structures.

^v While it is possible that some process shocks, especially labor certifications, will pertain as well to capital-labor relations, we assign civil society shocks their own category given that the literature specifically identifies them as critical in determining the structure of domestic practices and institutions (Biggart and Guillen 1999, Edwards and Kuruvilla 2005, Locke 2013). Therefore, if buyers or demand-market actors require a certification of labor standards, this remains a process shock until local actors and institutions display their own capacity to shape firms' decisions in the process.

^{vi} Following Collier and Mahoney (1996), we are arguing that there is causal homogeneity between cases of upgrading, but causal heterogeneity when the sample is expanded to include cases of no upgrading.

^{vii} A third reason for our selection on the dependent variable is more practical: we encountered a pre-existing file drawer problem, insofar as the published and unpublished literature is already biased toward the most impressive, positive outcomes of upgrading.

^{viii} This shows an interesting contrast to research focused on the private regulation of labor and work safety standards by advanced-country buyers over developing-country suppliers, which finds significant limitations in buyers' abilities to exert control over their suppliers (Esbenshade 2004, Vogel 2006, Locke 2013).

^{ix} Of these eighteen cases, at least five, though reported as successes by their authors, merely involved upgrades that ensured non-elimination from market competition (see e.g. Gomes 2010:74). All five of these cases of "coder-designated" treadmilling arose in primary products industries, corroborating, albeit weakly, the previous observation that leaps forward appear more likely to occur in manufacturing.

^x Whereas the reliance on just one or a small number of similar buyers may constrain the scope and breadth innovations, active cultivation of multiple buyers – including in multiple consumer markets, as well as potentially multiple product sectors – may enhance firms' room to maneuver and their ability to usefully cross-pollinate innovative ideas (Navas-Alemán 2011, Kaplinsky and Farooki 2011).

^{xi} Both of these are suggestive of a third condition which may also impact state intervention: the degree to which the wellbeing of the industry seeking to upgrade is salient to the state, largely in terms of its importance to national exports and employment. That is because states will probably pay greater attention to collective demands from influential firms, and state bureaucrats are likely to have been involved in solving previous problems for such an industry.

Tables and Figures

Table 1. Number of included and excluded documents in each stage of the review

Stage	Name	Included	Excluded
2	Preliminary Search	566	-
3	Database Search	520	-
4	Journal Search	2	-
5	Title and Abstract Analysis	188	900
6-8	Stratified selection and coding	39	149

Table 2. Case distribution and stratification strategy

	Total industry cases (188 eligible documents)	Percentage of total industry cases	Read industry cases (39 documents)	Percentage of read industry cases
LATIN AMERICA	29 (/103)	28%	13 (/45)	29%
Agriculture	11	11%	5	11%
Aquaculture	1	1%	1	2%
Mining	0	0%	0	0%
Agro-industry	7	7%	3	7%
Manufacturing	10	10%	4	9%
AFRICA	34	33%	15	33%
Agriculture	15	15%	5	11%
Aquaculture	3	3%	1	2%
Mining	1	1%	0	0%
Agro-industry	5	5%	5	11%
Manufacturing	10	10%	4	9%
ASIA	32	31%	15	33%
Agriculture	3	3%	2	4%
Aquaculture	7	7%	4	9%
Mining	1	1%	1	2%
Agro-industry	2	2%	0	0%
Manufacturing	19	18%	8	18%
EUROPE	7	7%	2	4%
Agriculture	0	0%	0	0%
Aquaculture	0	0%	0	0%
Mining	0	0%	0	0%
Agro-industry	0	0%	0	0%
Manufacturing	7	7%	2	4%
OCEANIA	1	1%	0	0%
Agriculture	0	0%	0	0%
Aquaculture	0	0%	0	0%
Mining	0	0%	0	0%
Agro-industry	0	0%	0	0%
Manufacturing	1	1%	0	0%
TOTAL	103¹	100%	45	100%

¹ 103 unique industry/country combinations after removing all non-inertial (e.g. automotive, services) industries from the pool.

Table 3: Incidences of shocks and responses by category (product, process, civil society) and possible combinations

Shock Type(s)	Search Observed		No Search Observed	
	Cases	Authors	Cases	Authors
None	1 case		0 cases	
	Colombia Coffee (T)	Rueda and Lambin 2013		
Process	11 cases			
	Brazil Furniture	Barin Cruz and Boehe 2009		
	Morocco Apparel	Cammett 2007		
	Tunisia Apparel	Cammett 2007		
	Malawi Tobacco (T)	Moyer Lee and Prowse 2012		
	Chile Salmon (T)	Rainbird and Ramirez 2012		
	Vietnam Wood	Song Hahn 2009		
	Zambia Beer	Van Wijk and Kwakembos 2012		
	Ghana Beer	Van Wijk and Kwakembos 2012		
	Uganda Beer	Van Wijk and Kwakembos 2012		
	Sierra Leone Beer	Van Wijk and Kwakembos 2012		
	Mexico Horticulture (T)	Sandoval Cabrera 2012		
Product	0 cases		0 cases	
Civil Society	0 cases		0 cases	
Product and Process	25 cases		2 cases	
	Mexico Apparel (T)	Bair and Gereffi 2001, Vera Garcia 2001	Madagascar Apparel	Morris and Staritz 2014
	Brazil Ceramics (T)	Garcia and Scur 2010		
	Brazil Footwear (L)	Bazan and Navas-Aleman 2003	South Africa Furniture	Kaplinsky et al 2002
	Chile Wine	Cusmano et al 2010		
	South Africa Wine	Cusmano et al 2010		
	Brazil Fresh Fruit (T)	Gomes 2004		

	South Africa Canned Fruit (T)	Kaplan and Kaplinsky 1999		
	Argentina Wine	McDermott 2007		
	Pakistan Surgical Instruments (T)	Nadvi and Haller 2005		
	Nicaragua Dairy (T)	Perez Aleman 2013		
	Bulgaria Apparel (T)	Pickles et al 2006		
	Slovakia Apparel	Pickles et al 2006		
	Uganda Nile Perch (T)	Ponte 2007		
	Bangladesh Shrimp and Prawns (T)	Ponte et al 2014		
	China Tilapia	Ponte et al 2014		
	Vietnam Pangasius	Ponte et al 2014		
	Peru Vegetables (T)	Schuster and Maertens 2015		
	Brazil Vegetables	Selwyn 2008		
	Malawi Fruit (T)	Smith 2013		
	India Apparel (L)	Tewari 1999, 2006, 2008; Dolan and Tewari 2001		
	Indonesia Mining	Tijaja and Faisal 2014		
	Turkey Apparel (L)	Tokatli 2007		
	Kenya Vegetables	Dolan and Tewari 2001		
	Kenya Flowers (T)	Zylberberg 2013, Riisgard 2009		
	India Fruit (T)	Singh 2013		
Process and Civil Society	2 cases		2 cases	
	Pakistan Sporting Goods (T)	Nadvi 2008	Pakistan Sporting Goods	Lund Thompsen et al 2012
	China Sporting Goods (L)	Lund Thompsen et al 2012	India Sporting Goods	Lund Thompsen et al 2012

Product and Civil Society	0 cases	0 cases
Systemic Vulnerability	4 cases	0 cases
	Vietnam Apparel (L)	Nadvi et al 2004
	Mexico Horticulture (L)	Sandoval Cabrera 2012 ²
	China Apparel (L)	Zhu and Pickles 2014
	Thai shrimp and Tilapia	Ponte et al 2014

(L): Leapfrogging

(T): Treadmilling

² This article was a long-term (1900-2010) historical analysis that covered the same industry during very distinct eras. The mid-20th century was a time of systemic vulnerability and a major leap forward for the industry; the 1980s forward were a time where process shocks led to upgrade attempts that resulted in treadmilling. Due to the more complex periodization of this article than most in the literature, it is listed twice in the tables, once for each of these key time periods.

Table 4. Shocks by category, subcategory and source

Category of shock	Sub-category	# of industry cases mentioning this shock	Sources
Change in trade regulations	Gain or loss of preferential trade benefits, protections	7	Nadvi et al. 2004, Cammett 2007, Vera-Garcia 2001, Pickles et al. 2006, Tewari 2006, 2008 (counted as 1), Van Wijk and Kwakkembos 2012, Cusmano 2010
	Shifts in import standards and/or import ban from destination country	13	Ponte 2007, Song Hahn 2009, Dolan and Tewari 2001 (2 cases), Barin-Cruz and Boeche 2009, Nadvi and Haller 2005, Moyer-Less and Prowse 2012, Nadvi 2008, Morris and Staritz 2014, Singh 2013, Smith 2013, Perez-Aleman 2013, Selwyn 2008
Heightened intra-industry competition	Loss of key buyer firm	2	Tokatli 2007, Nadvi 2008
	Demand for greater value/service by buyers (not certifications)	2	Cammett 2007, Bazan and Navas-Aleman 2003
	Demand for certifications by buyers (eg ISO 9000, labor codes of conduct, ...)	8	Nadvi et al. 2004, Rainbird and Ramirez 2012, Riisgard 2009, Moyer-Lee and Prowse 2012, Lund-Thomsen et al. 2012, Schuster and Maertens 2015, Gomes 2004, Selwyn 2008
	General pressure from increasingly productive/efficient competitors	14	Nadvi et al. 2004, Vera-Garcia 2001, Dolan and Tewari 2001 (2), Rainbird and Ramirez 2012, Garcia and Scur 2010, Bazan and Navas-Aleman 2003, Pickles et al. 2006, Barin-Cruz and Boeche 2009, Nadvi and Haller 2005, Cusmano 2010, Lund-Thomsen et al. 2012, Singh 2013, Smith 2013
Macro-economic conditions	Global economic crisis – general or industry-specific (eg commodity prices)	2	Zhu and Pickles 2014, Perez-Aleman 2013
	Domestic economy shift in terms-of-trade (e.g. currency appreciation, economic collapse)	5	Zhu and Pickles 2014, Bazan and Navas-Aleman 2003, Pickles et al. 2006, Bair and Gereffi 2001, Morris and Staritz 2014
	Appearance of new demand markets or collapse of former ones, domestic and/or foreign	7	Garcia and Scur 2010, Bair and Gereffi 2001, Sandoval Cabrera 2012, Pickles et al. 2006, Cusmano 2010, Tewari 1999, McDermott 2007
Domestic regulation	Increased standards (eg labor, environmental)	1	Zhu and Pickles 2014
	Gain or loss of domestic industry subsidies	6	Kaplan and Kaplinsky 1999, Sandoval Cabrera 2012, Zylberberg 2013, Gomes 2004, Perez-Aleman 2013, McDermott 2007
	Shift in domestic regulations over foreign investment	1	Tijaja and Faisal 2014
	TOTAL	68	

Table 5. Cases of state learning

Type of state learning/capacity	#of cases	Sources
---------------------------------	-----------	---------

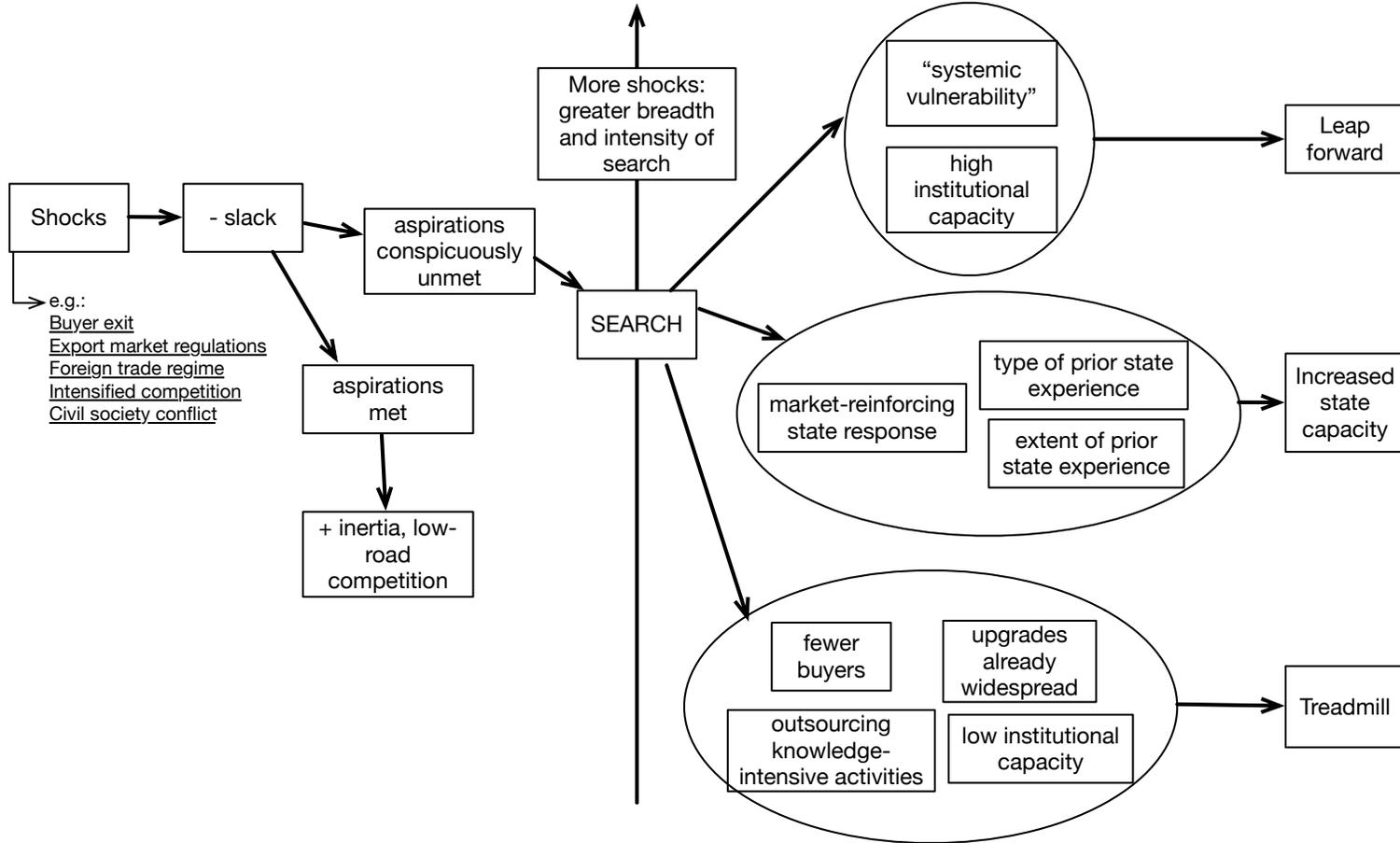
enhancement

Regulation, monitoring and evaluation of firm performance	4	Ponte (2002), Ponte et al (2014)
Customized provision of goods for firms and industries	9	Tewari (1999), Tewari and Dolan (2001), Ponte (2002), Cammett (2007), Tewari (2006), Tewari (2008), Garcia and Scur (2010), Cusman et al (2010), Rainbird and Ramirez (2012), Zhu and Pickles (2014)

Figure 1: Induced Search Framework

Stage 1: Vulnerability

Stage 2: Search environment



Appendix A: Inclusion and Exclusion Criteria for GVC Industry Case Studies

Inclusion criteria:

1. A case of firms in an inertial context, in terms of:
 - a. Features of oligopolistic competition in the national market (e.g. concentration of large firm ownership, large informal sector);
 - b. Low workforce investment;
 - c. Low R&D as share of GDP;
 - d. Higher-technology sectors dominated by foreign direct investment (FDI).
2. A documented outcome of upgrading that involves changes in products made, demand market, production method, and/or industrial relations.
3. A documented impetus for the initiation of industrial upgrading – in terms of the individual, organizational, and/or institutional carriers of the impetus, whether internal or external to the firm, as well as the nature of the impetus in terms of how it was made and how actors in the firm understood their imperatives.

Exclusion criteria:

1. No primary case data – e.g., the paper only introduces secondary analysis of data from other published studies, or is a theoretical study that does not refer to specific empirical cases of industries in a given place or set of places.
2. Too many cases to treat any individual case with enough depth to explain sources of data, sources of change, and results of change.
3. Inadequate data if author(s) do not:
 - a. Explain clearly how firm-level practices after upgrading were different from those that preceded it;
 - b. Provide a clear account of changes in local competition and development outcomes after upgrading;
 - c. Employ triangulated data sources – from multiple firms and different stakeholders (e.g. state employees, workers, labor unions, overseas buyers, NGOs), as well as more than different quantitative indicators to show change in outcomes – to reconstruct the upgrading process from causes, to upgrading efforts, to subsequent outcomes.