Benchmarking Global Production Sourcing Decisions: Where and Why Firms Off- and Reshore

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May 2, 2016

Abstract

This paper reports on the results of a global field study conducted in 2014 and 2015 amongst leading manufacturers from a wide range of industries. It provides insights about managerial practice surrounding production sourcing as well as the factors driving these decisions. Exploratory factor analysis and multiple logistic regression models using the response data generate the following seven key findings: (1) Companies are currently restructuring their global production footprints. (2) The majority of firms engage in offshoring. Reshoring is indeed occurring but not largely for corrective reasons. (3) North America may be at the cusp of a manufacturing renaissance, but not because of reshoring. (4) China is still the most attractive source for production, followed by developing economies in Eastern Europe and Southern Asia. (5) The decline of manufacturing in developed economies, i.e., Western Europe and Japan, continues. (6) Labor cost, is no longer the driving force in manufacturing location decisions. Instead, firms make complex trade-offs among a variety of factors. (7) Firms localize production in developed economies and use developing economies as production hubs.

Key words: manufacturing location decisions, offshoring, reshoring

1 Introduction

This paper reports current trends in global production sourcing decisions and their drivers, based on the analysis of a benchmark survey of leading global manufacturing firms.[1] We observe a wave of restructuring of global supply chains primarily through offshoring. Yet, reshoring is a considerable phenomenon in our sample. China remains the most attractive region for production sourcing followed by Eastern European and Southern Asian countries. While Western Europe and Japan suffer from a net

[1] The study and its descriptive results are presented and discussed in the companion report (Cohen et al. 2016)

outflow of production volume, manufacturing in North America is growing, but not due to reshoring by American companies. When evaluating these decisions firms increasingly make complex trade-offs among a wide range of factors beyond labor cost.

We are currently in a period of restructuring of global supply chains, spurred by a changing global competitive landscape as well as changing centers of demand. For instance, in 2012 General Electric moved back to the U.S. its production of household appliances which had previously been offshored to China and Mexico (Crooks 2012). Two years later General Motors announced a USD 12bn investment in new plants in China (Cook 2014).

Global cost competitiveness has changed drastically in recent years. While the gap in total manufacturing cost between China and the U.S. was still substantial 10 years ago, it has almost marginalized and is expected to be fully closed by 2018 (Sirkin et al. 2014). Traditional perceptions of low-cost countries no longer hold true. At the same time globalization has not only opened the gates to cheap labor for Western manufacturers but also redistributed wealth globally, leading to changing centers of global demand.

The current restructuring of global supply chains reflects manufacturers' adaptation to this new environment. Decisions to reshore to Western nations, especially the U.S., receive special attention in business and popular press as well as politics (The Economist 2013) since this alleged *Manufacturing Renaissance* (Sirkin et al. 2012) holds the promise of returning the manufacturing jobs many believed to be lost. Over the past 25 years manufacturing has continuously shifted away from developed countries, taking jobs with it. For example in Germany, Japan and the U.S. manufacturing employment decreased by around 25% from 1991 to 2013 (Levinson 2015).

Despite the public attention paid to recent manufacturing location decisions, little is known in the academic community (Fratocchi et al. 2014, Arlbjørn and Mikkelsen 2014). Many theories and frameworks propose how location decisions – mostly from a company perspective – should be made but very little research has documented empirically what is actually happening inside an organization and what drives specific decisions. Prior empirical research focuses either on a narrow geography or on each company's decisions in the aggregate, neglecting the driving forces of individual decisions. This paper provides a global perspective on current production sourcing decisions and their individual drivers by reporting the results of a survey of supply chain executives.

Our research contributes to the theory of international manufacturing location decisions and differs from existing research in three ways: (1) It is not a typical consulting study as it allows for heterogeneity in the results and presents multiple perspectives that do not oversimplify. (2) Our research is no classical empirical study, either. The nature of the sample data sets this study apart from others due to the depth of the information our conclusions are based on. We gathered data from a global sample of the leading firms across the relevant manufacturing sectors. The respondents shared detailed and comprehensive insights concerning individual production sourcing decisions, i.e., information at the product (group) level. This dataset allows us to take an exploratory perspective similar to grounded theory research, understanding how executives think about location decisions and their driving forces unbiased by preconceived opinions or hypotheses. Hereby, our sampling method is closer to theoretical sampling as used in case study research compared to statistical sampling (Eisenhardt 1989). While the sample size and selection makes the generalizability of our results debatable we believe the in-depth information allows us to draw conclusion valid for our sample, which we believe is exemplary of the global manufacturing landscape. We thus see our research as a field study into recent production sourcing decisions by leading[2] global manufacturing firms. (3) The problem studied is highly relevant for the manufacturing competitiveness of companies as well as nations. Yet, as we will outline in the next section very little is known about the nature of current decisions and even more so the decision making processes from existing literature. Both of which are addressed in this research.

In particular, we aim to address the following research questions in this paper:

1. To what extent have global production sourcing networks changed over the last three years?
2. Has the offshoring activity of firms increased or decreased over this time frame? What are the major drivers behind the observed change?
3. Has the reshoring activity of firms increased or decreased over this time frame? What are the major drivers behind the observed change?
4. What is the role of the three main manufacturing regions (North America, Western Europe, and China) in the global production sourcing networks? Which regions have attracted manufacturing investments and which regions have seen divestment? What are the drivers behind such changes?
5. What is the role of developing economies (Southern Asia and Eastern Europe) in the global production sourcing networks? What are the observed changes the last three years, and what factors can explain these changes?

The remainder of the paper is structured as follows. We first review the existing literature focusing on prior empirical work before we outline our methodological approach. We then present which production sourcing decisions are made by our respondents, contrasting offshoring, i.e., locating manufacturing operations – volume or entire sites – outside the region of the business unit's headquarter, and reshoring decisions, i.e., relocating manufacturing operations to the region of a business unit's headquarter. The decisions are further explored in greater detail identifying the driving forces of decisions to in- and divest in China, North America, and Western Europe, as well as of investment decisions for Eastern Europe and Southern Asia. We conclude by discussing the key trends observed in our sample in comparison to other empirical research and in light of theoretical models, and outline implications for managers and policy makers.

[2] Our sample includes for example, 4 of the 10 largest automotive OEMs, 2 of the 10 largest electronics companies, and 2 of the 10 largest engineering firms.

2 Literature Review

The general body of literature on how and why companies (should) make manufacturing location decisions is well established. Theoretical concepts in different streams of literature try to explain and predict manufacturing location decisions. The theory of the business/economic/industry/competitive cluster (Porter 1990, 1998) highlights the benefits of proximity to peers performing similar activities, around which will arise a lively ecosystem of enabling resources. Further theories applied in this context include transaction cost economics (McIvor 2013), internalization theory (Buckley and Casson 2009), and eclectic theory (Dunning 1980, 1998).

OM/OR literature provides conceptual and mathematical models explaining manufacturing location decisions in international manufacturing networks (for reviews see Melo et al. 2009, Cheng et al. 2015, Cohen and Cui 2015). Mathematical models tend to focus on optimal production network configurations under specific circumstances while the conceptual models provide an overview over the factors to consider in global production sourcing decisions.

Cohen and Lee (1989) present a mathematical model which identifies the optimal resource allocation in a global manufacturing network to optimize profits. Lu and van Mieghem (2009) model offshoring decisions from a network capacity investment perspective. They study the optimal facility design for a common component of different products produced for and in different markets. Wu and Zhang (2014) model the production sourcing decisions between local and offshore sourcing deriving implications under which circumstances companies should be reshoring. Huchzermeier and Cohen (1996) apply real options theory to model the manufacturing locations under exchange rate uncertainty. Dong et al. (2009) build on this research investigating facility network design in the presence of exchange rate uncertainty and competition. It offers insights when firms localize supply chains for regional markets versus when they use a global network to supply all markets. Kouvelis et al. (2013) provide a conceptual framework and formulate a structural equations model to explain which factors drive changes in international facility networks over time, and which factors determine the differences in structures of facility networks of global firms.

On the side of the conceptual models Kouvelis and Niederhoff (2007) present a framework on the many factors potentially driving global production sourcing decisions. Tsay (2014) reviews various theories about how geographic distance influences coordination of a supply chain, and groups the main motives for placement of manufacturing as follows: (1) access to resources (human, natural, and man-made), (2) proximity to customers, (3) proximity to suppliers, and (4) governmental restrictions (e.g., local content requirements) and incentives (e.g., preferential tax/duty rates). The first three factors emerge organically from economic fundamentals, while the last reflects societal intervention. Kouvelis and Su (2005) discuss the design and location of sourcing, production and distribution facility networks for global markets summarizing both, conceptual frameworks on global supply chain design issues and some of the decision support models, thus bridging both streams of research.

While the underpinning theories of manufacturing location decisions are well established there is a growing interest in current decisions that result from the application of these theories. Anecdotal evidence from business press articles as well as preliminary empirical evidence from academics suggests that companies are indeed reconfiguring their supply chains and global manufacturing footprints. Reshoring has received special attention (Tate 2014).

Some sources interpret reshoring as a corrective action, meaning that it attempts to reverse an earlier location decision that turned out badly (Kinkel and Maloca 2009, Gray et al. 2013, Fratocchi et al. 2014). Others acknowledge that a shift in production may be the legitimate response to a changing business environment (Tate et al. 2014b). The Boston Consulting Group compares total manufacturing costs across the globe. It has concluded that the once substantial cost gap between developed, i.e., the U.S., and developing countries, i.e., China, has diminished to an extent that some products may be even cheaper to produce in the U.S. (Sirkin et al. 2014). The same trend is emerging in other regions (Treville and Trigeorgis 2010).

Sirkin et al. (2014) explain this development by changes to the differentials in productivity-adjusted labor cost, the appreciation of the currencies of many developing economies, rising oil prices and consequently transportation costs, as well as changes in energy costs. Consequently, the very reason that for the past 25 years made companies offshore – labor cost – may now lead to reshoring of production volume. Indeed, various sources report that companies nowadays include more factors than just labor cost when making manufacturing location decisions. Proximity and access to markets, risk resilience, and flexibility seem to be growing in importance (Kinkel and Maloca 2009, Simchi-Levi et al. 2012, Ellram et al. 2013, Chen et al. 2015).

A number of empirical studies provide preliminary evidence on the scope of current production sourcing decisions. The publications by Kinkel and Maloca (2009), Ellram et al. (2013) and Chen et al. (2015) are closest to our research due to commonalities in survey methodology.

Kinkel and Maloca (2009) surveyed German companies on offshoring practices. Analyzing the 1663 responses using a probit regression model and descriptive statistics revealed that production offshoring has lost momentum. Reshoring is a quantifiable but small phenomenon among these firms. Between 16 and 25 percent of all offshoring decisions are countered by a reshoring activity within four years. While the remaining offshoring activities, predominantly to Eastern Europe and China, are driven by labor cost, reshoring activities seem to be driven mainly by flexibility and quality concerns. In a follow-up study with European firms, Dachs et al. (2012) essentially confirm these findings.

Ellram et al. (2013) surveyed a U.S. sample. They applied the location aspect of internationalization theory to understand how the perception of a region's attractiveness for manufacturing evolves and which factors affect these decisions on a firm level. They performed exploratory factor analysis to condense the pool of potential decision drivers to a set of eight factors, then used multiple OLS regression to associate these factors with decisions to change production volume in any given geographic region. They find that the drivers for manufacturing location decisions change over time and vary by region. Further, they see a growing importance for supply chain related factors. They conclude that companies in their sample move beyond mere labor cost comparisons and place more emphasis on total factor cost, profitability, and customer value. In the extended report of their study Tate et al. (2014a) outline the descriptive results and further document a moderate trend of reshoring to the U.S. which varies in strength by industry.

Chen et al. (2015) is the predecessor to our study. They survey 49 multinational companies with operations in China. Using descriptive statistics and correlation analyses the authors find no significant trend to reshore production to developed economies. Further, they elaborate that prevailing decision processes make trade-offs among a multitude of factors. In contrast to studies that investigate decisions on a firm level, Chen et al. (2015) is the first survey-based, academic research to choose individual decisions as the unit of analysis. This enables the linking of decision drivers directly to the outcome.

Da Silveira (2014) explains offshoring activities by manufacturing strategy, i.e., the factor costs, flexibility, and delivery. He finds that offshoring decisions are primarily driven by cost and flexibility but not delivery.

Complementing the survey-based literature are two case-based studies that investigate reshoring decisions in greater depth. In a series of 10 case studies with Spanish footwear manufacturers, Martínez-Mora and Merino (2014) found that companies that offshored production during the 1990s later increased production volume at home while also keeping production offshore. In contrast to Kinkel and Maloca (2009) and Gray et al. (2013), they find that reshoring is not necessarily a corrective action but rather a reaction to a changing business environment and factors that were not present or critical at the time of the initial offshoring decisions. Therefore, changes in cost competitiveness and currency exchange rates are reported to have driven the reshoring decisions.

Gylling et al. (2015) partially supports both views in a single case study of a Finnish manufacturing company's offshoring and subsequent reshoring. They found that the reshoring decision was of corrective nature, as quality issues and a wave of rationalization in the home plant made domestic production more attractive. Both factors could have been foreseen or at least explored prior to the decision. However, reshoring also became the preferred option due to changes in the business environment, especially in currency exchange rates and customer demand. Case-based research affirms that optimum production location decisions are not static. Reshoring may best be interpreted as an adaptation to changes in the business environment.

Professional associations and management consulting firms also research trends in manufacturing location decisions. The supply chain management professional association SCM World, for example, surveyed 330 supply chain executives. Its study concluded that China has become less attractive as a site for fewer offshore production due to increased total manufacturing cost, less favorable government policies, and obstacles caused by cost and availability of labor. Instead companies are moving to ASEAN countries for cheaper labor or the U.S. and Mexico for market access. The authors confirm that

Reference	Sample size	Geography	Unit of analysis	Methodology	Decisions	Drivers
Kinkel and Maloca 2009	1663	Germany	Firm	Survey, descriptive statistics, probit regression	Off-/reshoring decisions	Yes
Dachs et al. 2012	1452	Europe	Firm	Survey, descriptive statistics, probit regression	Off-/reshoring decisions	Yes
Ellram et al. 2013 & Tate et al. 2014a	319	U.S.	Firm	Survey, exploratory factor analysis, OLS regression	Production volume investments	Yes
Accenture 2014	250	China, U.S.	Firm	Survey, descriptive statistics	Relocation of manufacturing	No
van den Bossche et al. 2014 & 2015	700	U.S.	Firm	Secondary data, descriptive statistics	Reshoring decisions	No
O'Marah and Lee 2013	330	Global	Firm	Survey, descriptive statistics	Degree of offshoring and reshoring	No
da Silveira 2014	725	Global	Firm	Survey, descriptive statistics, regression	Offshoring decisions	Yes
Martínez-Mora and Merino 2014	10	Spain	Decision	Case studies	Off- and subsequent reshoring decisions	Yes
Gylling et al. 2015	1	Finland	Decision	Case study	Off- and subsequent reshoring decision	Yes
Chen et al. 2015	49	China	Decision	Survey, descriptive statistics, correlations	Production volume sourcing decisions	Yes
This paper	74	Global	Decision	Survey, descriptive statistics, exploratory factor analysis, logit regression	Production volume sourcing decisions	Yes

Table 1: Comparison of empirical studies

company strategies increasingly move beyond labor cost comparisons to a wider pool of considerations, especially agility (O'Marah and Lee 2013).

The management consulting firm Accenture (2014) surveyed U.S. and Chinese manufacturing executives. They find evidence for the current reconfiguration of supply chains and report a trend towards nearshore production for American companies. However, A.T. Kearney argues that reshoring to the U.S. is over-hyped, as the scope of the phenomenon is much smaller than the media attention would suggest. This conclusion results from analysis of macroeconomic data and 700 cases of companies reshoring production (van den Bossche et al. 2014). The latest version of the study finds even further growth in offshoring over reshoring activities (van den Bossche et al. 2015).

Table 1 shows that the majority of empirical studies choose a rather narrow geographic focus and therefore are limited in their ability to track shifts of production volume. Further, many of the studies investigate decision making at the level of the entire firm. Thus, drivers of individual decisions cannot be identified (Ellram et al. 2013). To the best of our knowledge, ours is the first study to map current production sourcing decisions on a global scale and to tie them to decision drivers.

3 Methodology

3.1 Data Gathering

To answer the research questions outlined in the introduction we collected data using both online and paper-based versions of a questionnaire. This instrument greatly enhanced the questionnaire developed for the predecessor study in China (see Chen et al. 2015), with new lines of inquiry and edits to better capture meaning. Respondents provided information about a specific production sourcing decision instance, and explained how the decision resulted in changes in production volumes in the different regional facilities the company has in its network. Our unit of analysis is the aforementioned decision instance. We also asked about the firm or business unit, the product, the importance of various decision drivers, and the current sales and production footprint. Providing this data entailed a considerable effort for the participating companies. Given the scope and depth of the questions, respondents had to not only gather data from multiple sources but also obtain clearance to share highly confidential data with an external party. The dataset is described descriptively in detail in the companion report (Cohen et al. 2016) illustrating the depth of the information obtained.

The information provided by each firm is on a single product category, and most firms source their products from multiple regions. In the reported decision instance, our respondents indicated how their production sourcing changed across regions over the last three years, and identified the important drivers behind these changes from a set of 24 potential drivers. That is, the unit of analysis in this study is the decision at the product level. If the unit of analysis were to be the firm, then the responses would reveal only volume changes aggregated across multiple product categories. This might, for example, obscure the reasons why in a given region a firm simultaneously increases one product's production there but decreases the volume of another. Note that the drivers related to quality, cost and delivery are generally ranked high in the descriptive results in Table 15. However, the drivers that actually tip the scales in volume change decisions in each region are different from those with high rankings.

The questionnaire was distributed through the professional networks of the involved faculty members, to selected customers of our industrial partner Avnet, and to a list of the largest manufacturing firms in Europe and Japan. We promised strict confidentiality. Invitees were incentivized with early access to the results of the study and an invitation to a roundtable conference with the research team and representatives of fellow responding companies. We sent regular follow-up messages to increase the response rate. The employed sampling method can be classified as theoretical sampling as used in case study research, i.e., cases are chosen for theoretical reasons, compared to random sampling for statistical reasons (Eisenhardt 1989). In particular we selected cases that reported changes in production sourcing over the past three years. Similar sampling strategies have been widely adopted, e.g., recently by Chandrasekaran et al. (2016).

3.2 Sample Profile and Biases

85 respondents completed the questionnaire, of which 74 became the final sample. The 11 discarded responses did not report any changes. While this reveals something about the degree of restructuring in supply chains, we excluded these responses as they could not enhance understanding of the decision-making. Respondents were supply chain executives (68% VP or higher) from a wide range of industries (see Table 2), based primarily in North America (37%), Europe (31%), and Asia (28%).

Industry	Absolute	Relative
Automotive	11	15%
Capital Goods	10	14%
Consumer Goods	13	17%
Information Technology	12	16%
Machinery	14	19%
Other	14	19%

Table 2: Respondents by industry (n=74)

Our data collection spanned multiple months in 2014 and 2015 and the number of invitations was much larger than the final sample size. We tested nonresponse bias using Chi-squared tests and t-tests comparing early and late responses, which proved insignificant. Common method variance is a risk since both our dependent and independent variables come from the same source. However, Harman's single factor test finds that more than one factor accounts for the majority of the variance in our data.

3.3 Variables

Our research seeks to understand what production sourcing decisions are currently made in industrial practice and what is driving these decisions. The first is addressed by survey responses documenting where firms are in- or decreasing production volume. To address the second we analyze the responses using logit regression models. The individual decision to invest in or divest of production serves as our binary dependent variable. We select the eight in- and divestment decisions with the highest share of responses. We further analyze on a global scale what drives firms to off- or reshore manufacturing. For these decisions we create two binary dependent variables indicating whether or not a firm has offshored or reshored production.

We define reshoring in this context as an increase in production volume in the region where the business unit’s headquarter is located following the definition of domestic manufacturing outlined by Brush et al. (1999). While focusing on the location of the headquarter may generally be misleading due to issues such as tax inversion as Tsay (2014) points out, in our sample it appears appropriate as for the majority of our respondents the headquarter location corresponds with the firm’s historic origin and/or the operational focus region. We define reshoring in a wider sense to include all investments in one's

Factor	Driver Variable	Factor Loading	Uniqueness
Policy & Risk	Political Stability	0.833	0.175
	Government Regulations	0.767	0.215
	Natural Disasters	0.764	0.204
	Exchange Rate Volatility	0.755	0.305
	Government Incentives	0.687	0.315
	Public Infrastructure	0.669	0.314
Innovation	Time to Launch a New Product	0.856	0.211
	Innovation & Design Capability	0.812	0.235
	Environmental Sustainability	0.721	0.167
	IP Protection	0.695	0.309
	Management Complexity	0.669	0.338
	Automation & Techn. Advancem.	0.665	0.370
	Product Quality	0.568	0.401
Energy & Fixed Cost	Energy Costs	0.776	0.191
	Fixed Costs	0.589	0.608
Agility	Delivery Lead Time	0.851	0.116
	Supply Chain Flexibility	0.731	0.220
Supply	Raw Material Costs	0.700	0.277
	Supply Availability	0.644	0.247
	Logistics Costs	0.563	0.495
Proximity	Market Changes	0.646	0.393
	After Sales Services Quality	0.609	0.381
	Labor Costs	-0.564	0.375

Only factor loadings greater than 0.55 are reported

Table 3: Rotated factor loadings of driver variables

home region, as an investment at home without a reduction of production volume offshore still changes the balance between on- and offshore manufacturing.

To understand the driving forces behind the ten focal decisions, which serve as our binary dependent variables, we first reduce the number of independent variables as the full format has potentially 53 explanatory variables per decision. We conduct principal factor exploratory factor analyses on the 24 driver variables, our main focus, as well as the 18 product characteristics variables which serve as control variables. Bartlett's tests of sphericity prove significant for both analyses (Drivers: $\chi^2 = 939.740, df = 276, p = 0.000, n = 74$; Product Characteristics: $\chi^2 = 290.638, df = 153, p = 0.000, n = 74$) and Kaiser-Meyer-Olkin measures of sampling adequacy are above 0.50 (Drivers: $KMO = 0.765$; Product Characteristics: $KMO = 0.536$) suggesting that our two groups of variables are generally suitable for factor analysis (Hair et al. 2014). Both analyses are based on polychoric correlation matrices as the variables are coded on non-symmetrical Likert scales in the questionnaire and are thus considered ordinal.

For the decision driver variables six factors are retained based on Kaiser criteria and comparative model fit statistics. Their Eigenvalues are greater than 0.90, they cumulatively explain more than 75% of the variance, and the scree plot flattens out only after the 6th factor (Hair et al. 2014). Six factors also provide a good trade-off between minimizing AIC and BIC (Akaike and Bayesian information criteria) when comparing with solutions retaining different numbers of factors. The retained factors are rotated

Factor	Product Characteristic Variable	Factor Loading	Uniqueness
Unstable Demand	Demand Sensitive to Product Quality	0.781	0.373
	Demand Sensitive to Service Quality	0.609	0.491
	Demand Volatility	0.515	0.633
	Modular Product	0.412	0.809
R&D Intensive Components	Input for Other Products	0.742	0.326
	Proximity to R&D important for Innovation	0.528	0.611
	Value Chain Position	-0.736	0.382
Automated Production	Capital-Intensive Production	0.809	0.278
	Energy-Intensive Production	0.720	0.447
	Knowledge-Intensive Production	0.569	0.292
Craftsmanship Products	Unit Cost	0.614	0.605
	Labor-Intensive Production	0.473	0.744
	Demand Sensitive to Price	-0.427	0.553
	Standard Product/Function	-0.562	0.636
High Value Products	Profit Margin	0.705	0.468
	Value Per Weight	0.447	0.645
	Product Lifecycle Stage	-0.461	0.620

Only factor loadings greater than 0.40 are reported

Table 4: Rotated factor loading of product characteristics variables

using orthogonal Varimax rotation. One variable, labor quality & availability, loads on multiple factors but highly on none and is thus not presented in the table. For the product characteristics we retain 5 factors with Eigenvalues greater than 1.0 which cumulatively explain more than 0.85 of the variance. Also in this case we traded off minimizing AIC versus BIC by selecting the five factor solution. The resulting factors are rotated using normalized orthogonal Quartimax rotation to improve interpretability of the results.

The resulting factors are calculated using factor scores with the factor loadings as presented in Table 3 and Table 4. To test the robustness of our results we also computed the factors as the averages of the variables constituting a factor and repeated all subsequent analyses, which yielded very similar results.

For each selected production sourcing decision we include firm size, industry affiliation, origin as well as current sales and production activities in the respective region as additional control variables, as these have proven to be differentiators in other studies analyzing manufacturing location decisions (Kinkel and Maloca 2009, Lampel and Giachetti 2013). Our sample includes firms from the industries automotive, capital goods, consumer goods, machinery, IT and other industries as well as firms from Europe, Asia, North America and other regions. For both, industry affiliation and origin, the category other serves as the reference category in the regression models outlined in the next section.

Descriptive analyses of the location decisions provide the basis for the second part of the study. For the regions with the highest reported increase and decrease of production volume as well as off- and reshoring decisions we estimate multiple logit regression models in different specifications to understand what drives these decisions. The models are presented in section 4 in which we discuss the decisions to in- or decrease production volume in a region or to off-/reshore manufacturing which serve as dependent variables.

4 Results

4.1 Global flows of production sourcing

The firms in our sample report a wide variety of decisions made in recent years. To answer our research question regarding current manufacturing location decisions we provide descriptive statistics for responses about whether or not a firm has in- and/or decreased production volume in a region. As discussed in the introduction the results presented in this section pertain primarily to our sample. While we believe that our sample is representative of the global manufacturing landscape one should not generalize these findings without thorough reflection.

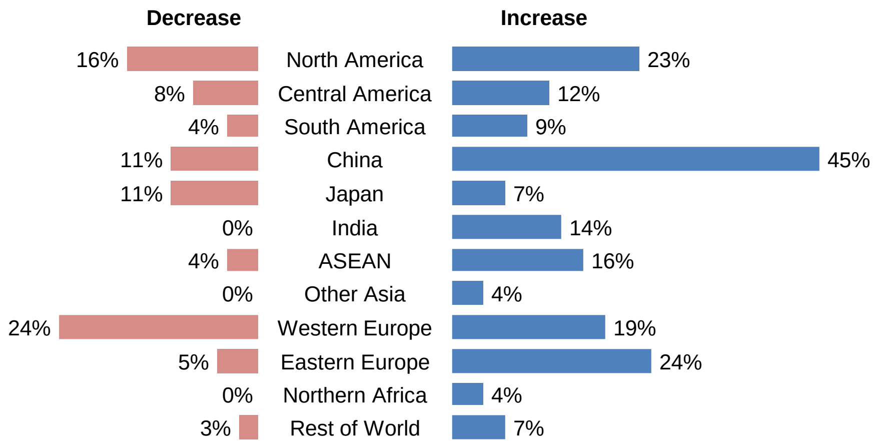

Figure 1: Share of respondents in- or decreasing production volume by region

Figure 1 shows that China remains the most attractive region for production sourcing. Almost half the sample (45%) reports investments in manufacturing in China, while only 11% of the sample divested.

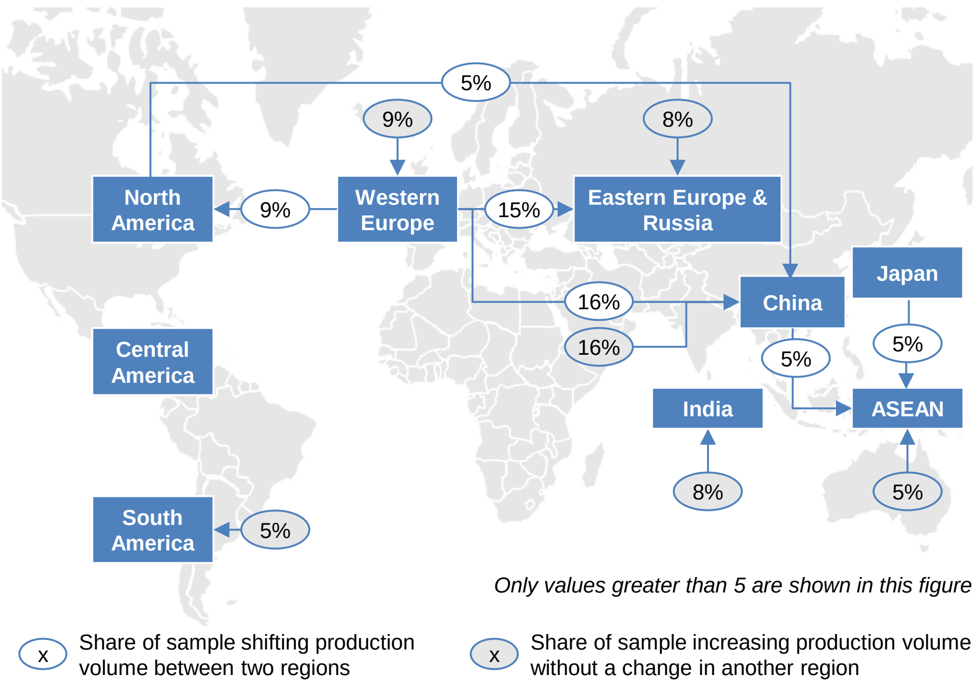

Figure 2: Flows of production volume between regions

Across the sample we can distinguish two groups of regions: developed and emerging economies. Emerging economies including China, India, the ASEAN and Eastern European countries show a distinct surplus of investments over divestments. For example, almost five times as many respondents increase production volume in Eastern Europe (24%) rather than decrease (5%). The situation is different for the developed economies (North America, Japan, and Western Europe). The number of firms investing is comparable to the number decreasing production volume. Only North America shows a surplus of investments over divestments, a moderate indication of the alleged *Manufacturing Renaissance* (Sirkin et al. 2012). We further analyze the flows of production volume among the regions of the world as shown in Figure 2. The following sections discuss the forces driving these flows.

4.2 Offshoring and Reshoring

76% of our sample engages in offshoring of production, i.e., investing in production outside one's home country. At the same time 32% are reshoring production. Reshoring is thus strongly evident in our sample, applying to almost a third of respondents. However, the incidence rate differs by region. In our sample the share of reshoring firms is highest among Western European companies with 36% compared to 28% for Japanese and 26% for North American firms respectively. While this difference is not statistically significant in a Chi-squared test ($\chi^2 = 0.681, df = 2, p = 0.711, n = 67$) it shows that reshoring is not only an American phenomenon even though the media attention is certainly the greatest in the U.S..

Using multiple logit regression in different model specifications we analyze the drivers of these decisions to offshore and reshore as presented in Table 5 and Table 6. The six factors selected from the original 24 driver variables serve as independent variables in our base model (Model I) as we are trying to understand what companies regard as important when deciding to source production from a certain region. Different model specifications complement this base model with the five factors derived from the product characteristics (Model II), the share of global sales and production volume represented by each region (Model III), the industry affiliation (Model IV), the region of the business unit's headquarters (Model V), and firm size expressed as the log of employee headcount (Model VI). We estimate a full model including all confounders (Model VII). Due to the heterogeneity of the data and the resulting challenges in fitting these models we show individual model configurations per group of covariates. Yet, not all models could be fitted. We omitted these configurations from the reported regression tables.

The models show that when controlling for other variables there is a statistically significant relationship between a firm's origin and its likelihood to reshore production. *European* firms are significantly more likely to offshore (Table 5-VII: $\beta = 7.749, p = 0.035$), while *Asian* firms are less likely to reshore production (Table 6-VII: $\beta = -8.521, p = 0.043$). We can explain the latter observation understanding that over the last decades European firms engaged less in offshoring than did North American companies, but now might see a need to establish local presences in emerging markets.

	I	II	III	IV	V	VI	VII
Policy & Risk	-0.344	-0.352	-0.407	-0.262	-0.300	-0.342	0.944
	(0.259)	(0.264)	(0.343)	(0.263)	(0.270)	(0.270)	(0.798)
Innovation	0.056	-0.044	0.157	0.050	0.017	0.083	-0.570
	(0.260)	(0.282)	(0.309)	(0.290)	(0.269)	(0.261)	(0.774)
Energy & Fixed Cost	-0.033	-0.067	-0.019	-0.011	-0.022	-0.036	0.197
	(0.109)	(0.115)	(0.121)	(0.113)	(0.114)	(0.110)	(0.381)
Agility	0.171	0.194	-0.007	0.137	0.127	0.247	0.634
	(0.276)	(0.294)	(0.355)	(0.291)	(0.300)	(0.293)	(0.854)
Supply	-0.222	-0.281	-0.440	-0.299	-0.199	-0.235	-0.717
	(0.267)	(0.303)	(0.321)	(0.286)	(0.271)	(0.274)	(0.657)
Proximity	0.086	0.042	0.429	0.450	0.170	0.060	2.399
	(0.277)	(0.306)	(0.353)	(0.329)	(0.297)	(0.287)	(1.547)
Unstable Demand		-0.143					-0.847
		(0.356)					(1.277)
R&D Intensive Components		0.080					-1.409
		(0.316)					(1.241)
Automated Production		0.026					1.424
		(0.284)					(0.885)
Craftsmanship Products		-0.271					-1.262
		(0.294)					(1.027)
High Value Products		0.302					0.087
		(0.318)					(0.847)
Sales in Home Region			0.020				0.091^{*}
			(0.013)				(0.052)
Production in Home Region			-0.030^{***}				-0.071^{***}
			(0.011)				(0.026)
Automotive				0.489			6.226^{*}
				(1.067)			(3.716)
Capital Goods				-1.282			-2.550
				(0.987)			(2.400)
Consumer Goods				-0.008			-2.824
				(0.957)			(2.629)
Machinery				0.124			3.383
				(0.983)			(2.943)
IT				1.902			5.883
				(1.381)			(4.065)
European					0.792		7.749^{**}
					(1.441)		(3.669)
Asian					0.300		0.827
					(1.412)		(2.258)
North American					0.803		1.511
					(1.496)		(2.692)
Employees (log)						-0.056	-0.932^{*}
						(0.142)	(0.493)
Constant	1.821	3.005	2.881	1.315	1.146	2.029	-3.707
	(1.669)	(2.933)	(2.107)	(1.756)	(2.195)	(1.942)	(11.939)
Observations	74	74	60	74	74	73	60
Pseudo R^2	0.055	0.081	0.196	0.137	0.063	0.064	0.542

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

Table 5: Logit regression models for offshoring

Firms with more *employees* are more likely to reshore (Table 6-VII: $\beta = 0.789, p = 0.082$), while smaller companies are more likely to offshore (Table 5-VII: $\beta = -0.932, p = 0.059$). This observation

	I	II	III	IV	V	VI	VII
Policy & Risk	-0.319	-0.324	-0.426	-0.339	-0.332	-0.457	-1.376
	(0.266)	(0.283)	(0.326)	(0.275)	(0.279)	(0.289)	(0.992)
Innovation	0.355	0.343	0.645*	0.495	0.357	0.394	0.660
	(0.273)	(0.307)	(0.351)	(0.307)	(0.283)	(0.282)	(0.538)
Energy & Fixed Cost	0.002	0.030	0.015	-0.020	-0.019	-0.034	-0.438
	(0.100)	(0.110)	(0.119)	(0.105)	(0.104)	(0.107)	(0.307)
Agility	-0.295	-0.347	-0.115	-0.217	-0.244	-0.137	-0.269
	(0.262)	(0.283)	(0.310)	(0.287)	(0.286)	(0.283)	(0.715)
Supply	-0.586**	-0.467	-0.762**	-0.686**	-0.600**	-0.781**	-2.552**
	(0.292)	(0.340)	(0.352)	(0.322)	(0.295)	(0.334)	(1.136)
Proximity	0.607**	0.591**	0.416	0.539*	0.572**	0.599**	-0.569
	(0.268)	(0.298)	(0.314)	(0.286)	(0.277)	(0.274)	(0.790)
Unstable Demand		-0.092					-1.533
		(0.366)					(1.176)
R&D Intensive Components		0.070					2.464*
		(0.307)					(1.473)
Automated Production		0.355					0.880
		(0.307)					(0.815)
Craftsmanship Products		0.585*					0.893
		(0.299)					(0.978)
High Value Products		-0.068					0.451
		(0.347)					(0.784)
Sales in Home Region			0.014				-0.007
			(0.012)				(0.024)
Production in Home Region			0.010				0.043*
			(0.009)				(0.024)
Automotive				0.816			2.465
				(0.971)			(2.128)
Capital Goods				0.373			-0.740
				(0.956)			(1.927)
Consumer Goods				1.371			7.109*
				(0.929)			(3.978)
Machinery				1.534*			1.800
				(0.873)			(2.401)
IT *(not evident in sample)*							
European					-1.062		-3.690
					(1.530)		(2.876)
Asian					-1.183		-8.521**
					(1.527)		(4.220)
North American					-1.301		-2.474
					(1.586)		(2.624)
Employees (log)						0.230	0.789*
						(0.146)	(0.454)
Constant	0.642	-0.554	-0.957	-0.225	1.778	-1.067	9.956
	(1.515)	(2.825)	(1.975)	(1.666)	(2.165)	(1.885)	(10.208)
Observations	74	74	60	74	74	73	60
Pseudo R^2	0.166	0.226	0.225	0.211	0.173	0.205	0.531

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

Table 6: Logit regression models for reshoring

fits a pattern observed in the recent past, with primarily larger corporations offshoring to China and other countries to exploit labor cost advantages. Smaller firms were more hesitant, waiting to achieve a critical local market size before investing in offshore manufacturing. While the larger firms now bring production back home in light of changing manufacturing cost competitiveness, smaller firms in some cases now start production offshore as the markets in emerging economies grow.

Automotive companies are more likely to offshore production (Table 5-VII: $\beta = 6.226\,, p = 0.094$) while *consumer goods* (Table 6-VII: $\beta = 7.109\,, p = 0.074$) and *machinery* (Table 6-IV: $\beta = 1.534\,, p = 0.079$) firms are more likely to reshore. Also, the current share of production in the home region determines a firm's likelihood to off- or reshore. While firms with more *production in the home region* tend to further reshore (Table 6-VII: $\beta = 0.043\,, p = 0.067$), firms with less production at home are more inclined to offshore (Table 5-III, VII: $-0.072 \leq \beta \leq -0.030\,, 0.008 \geq p \geq 0.007$). Firms thus seem to prefer to invest further in their existing footprint.

The regression analyses for decisions to offshore remain inconclusive with respect to the decision drivers and the types of products offshored. The descriptive analysis of the driver variables presented in Table 15 in the appendix, however, suggests that *product quality* (Table 15: $\mu = 3.93$) and *market changes* (Table 15: $\mu = 3.86$) are most important followed by supply chain related drivers and logistics, labor cost, and fixed cost. The following sections provide more detailed analysis of the drivers of offshoring decisions.

Supply has negative coefficients (Table 6-I, III-VII: $-2.552 \leq \beta \leq -0.586\,, 0.044 \geq p \geq 0.020$) while it is regarded as relatively high in importance (Table 15: $\mu = 3.38$ #6). That is, reshoring firms think *supply* affects them less negatively than it does the rest of firms. This may be because the reshoring firms already have an efficient supply base at home and/or because the characteristics of their products lead to such decisions. Production of *R&D intensive components* (Table 6-VII: $\beta = 2.464\,, p = 0.585$) as well as *craftsmanship products* (Table 6-II: $\beta = 0.789\,, p = 0.082$) are more likely to be reshored. Given that reshoring occurs in developed regions this is comprehensible as R&D has been offshored to a lesser degree than has manufacturing. Firms would reshore production to achieve proximity to R&D or if they are faced with a higher degree of complexity and require a specific skill set.

Reshoring seems very much driven by *proximity* to markets (Table 6-I, II, IV-VII: $0.539 \leq \beta \leq 0.607\,, 0.060 \geq p \geq 0.023$), with this factor ranked as most important (Table 15: $\mu = 3.92$). This means firms invest in their home regions so as to manufacture close to where demand occurs. Whether or not they offshored before, proximity to demand begins to dominate the advantages of producing offshore.

Comparing decisions to off- and reshore production it becomes evident that offshoring decisions appear to be more diverse as we will outline in the subsequent sections. A wide range of offshoring decisions is made for a diverse set of reasons. Decisions to reshore, in contrast, share a common theme of seeking proximity to demand as outlined in the discussion of the regression models in Table 6.

4.3 Production In- and Divestments in China

45% of our sample increased production volume in China, mostly shifting production from Western Europe or investing in China without reallocating production elsewhere. These decisions are to a large degree market driven and not cost driven as in the past. The descriptive results in Cohen et al. 2016 suggest that market considerations are responsible for production volume increases in China. Table 15 shows that respondents that increased production volume in China rank *market changes* as the most important decision driver (Table 15: $\mu = 4.03$). Also in the regression models, presented in Table 7, the factor *proximity* to markets proves significant in two of the model specifications (Table 7-III, IV: $0.607 \leq \beta \leq 1.526, 0.041 \geq p \geq 0.007$). The likelihood of investing in China increases with the share of *local sales* (Table 7-III: $\beta = 0.098, p = 0.003$) which further supports the hypothesis of demand-driven investments. Consistent with this pattern, production of *R&D intensive components* is significantly more likely to be shifted to China (Table 7-II: $\beta = 0.507, p = 0.090$). As China's importance as a consumer market grows, local R&D for local products will become more of a necessity.

Certain costs are still a meaningful concern for some firms when investing in China. *Energy & fixed cost*, i.e., the cost to set up and maintain facilities and equipment, turns out significant in one of the model specifications (Table 7-III: $\beta = 0.304, p = 0.047$). This does not necessarily mean labor cost, as that is ranked only 8th (Table 15: $\mu = 3.48$) whereas logistics costs, key to the proximity-seeking rationale, seem more important, ranked as 3rd most important driver (Table 15: $\mu = 3.76$).

Current production volume in China significantly increases the likelihood of investing in China (Table 7-III: $\beta = 0.059, p = 0.002$). Firms seem to choose China if they prefer to invest in existing plants or regions that are already familiar as a production location.

Among the companies investing in China only IT firms are more likely (Table 7-IV: $\beta = 1.699, p = 0.086$) to invest than others. This matches their current sourcing pattern, predominantly from Asian countries, i.e., China. Neither location nor firm size correlate with a firm's predisposition to invest in China.

While 45% of the sample increased production volume in China, a relatively small share of 11% decided to divest, of which half is shifting the production to ASEAN countries. Government *policies & risk* lead firms to divest as the factor turns out significant in 5 out of 6 model specifications (Table 8-I-IV, VI: $0.717 \leq \beta \leq 2.936, 0.085 \geq p \geq 0.042$) presented in Table 8. This may well be a response to the Chinese government's initiative to upgrade the type of manufacturing operations in the country (Qi 2015). Correspondingly, *R&D intensive components* (Table 8-II: $\beta = -3.838, p = 0.026$) and *high-value products* (Table 8-II: $\beta = -1.806, p = 0.071$) are more likely to remain in China.

Products with *unstable demand*, which benefit from shorter supply chains, are more likely to be moved out of China (Table 8-II: $\beta = 1.768, p = 0.078$). This is in line with the significance of *proximity* to markets in one of the model specifications (Table 8-II: $\beta = 2.659, p = 0.086$) as manufacturing of this kind of product tends to locate closer to where demand occurs.

	I	II	III	IV	V	VI
Policy & Risk	-0.163	-0.189	-0.396	-0.149	-0.129	-0.220
	(0.221)	(0.242)	(0.349)	(0.235)	(0.230)	(0.231)
Innovation	-0.103	-0.278	0.034	-0.181	-0.139	-0.072
	(0.229)	(0.266)	(0.280)	(0.240)	(0.235)	(0.230)
Energy & Fixed Cost	0.113	0.047	0.304**	0.127	0.106	0.101
	(0.092)	(0.103)	(0.153)	(0.097)	(0.094)	(0.093)
Agility	0.183	0.210	-0.475	0.112	0.180	0.284
	(0.241)	(0.255)	(0.425)	(0.264)	(0.261)	(0.257)
Supply	0.271	0.226	0.445	0.297	0.279	0.222
	(0.235)	(0.279)	(0.419)	(0.252)	(0.236)	(0.238)
Proximity	0.277	0.175	1.526***	0.607**	0.296	0.256
	(0.232)	(0.256)	(0.564)	(0.297)	(0.245)	(0.231)
Unstable Demand		-0.227				
		(0.323)				
R&D Intensive Components		0.507*				
		(0.299)				
Automated Production		0.041				
		(0.266)				
Craftsmanship Products		-0.396				
		(0.276)				
High Value Products		0.218				
		(0.297)				
Local Sales			0.098***			
			(0.034)			
Local Production			0.059***			
			(0.019)			
Automotive				0.552		
				(0.919)		
Capital Goods				-0.495		
				(0.969)		
Consumer Goods				-0.432		
				(0.899)		
Machinery				0.163		
				(0.884)		
IT				1.699*		
				(0.991)		
European					-0.389	
					(1.352)	
Asian					-0.829	
					(1.357)	
North American					-0.513	
					(1.392)	
Employees (log)						0.069
						(0.118)
Constant	-1.661	0.671	-4.340*	-2.120	-1.129	-2.373
	(1.449)	(2.549)	(2.510)	(1.686)	(1.950)	(1.715)
Observations	74	74	60	74	74	73
Pseudo R^2	0.083	0.148	0.416	0.144	0.089	0.090

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

Table 7: Logit regression models for production volume increase in China

The higher its current share of *local production* in China, the more likely a firm is to divest (Table 8-III: $\beta = 0.147$, $p = 0.071$). Firms that previously had offshored now again shift production. Given

	I	II	III	IV	V	VI
Policy & Risk	0.717*	2.405*	2.936**	1.179*	0.840	0.781*
	(0.416)	(1.301)	(1.444)	(0.608)	(0.516)	(0.417)
Innovation	0.076	1.574*	1.813	0.198	0.080	0.036
	(0.388)	(0.946)	(1.240)	(0.519)	(0.440)	(0.406)
Energy & Fixed Cost	0.130	0.769*	0.794	0.197	0.371	0.128
	(0.180)	(0.433)	(0.497)	(0.206)	(0.250)	(0.178)
Agility	0.050	-0.114	-3.061	-0.055	-0.466	-0.006
	(0.434)	(0.780)	(2.177)	(0.526)	(0.546)	(0.444)
Supply	0.484	0.132	-0.460	0.377	0.884	0.505
	(0.415)	(0.639)	(0.767)	(0.514)	(0.565)	(0.400)
Proximity	-0.080	2.659*	3.794	0.899	0.495	-0.110
	(0.467)	(1.550)	(2.334)	(0.732)	(0.642)	(0.459)
Unstable Demand		1.768*				
		(1.003)				
R&D Intensive Components		-3.838**				
		(1.719)				
Automated Production		-1.389				
		(0.952)				
Craftsmanship Products		-0.539				
		(0.656)				
High Value Products		-1.806*				
		(1.001)				
Local Sales			-0.281			
			(0.288)			
Local Production			0.147*			
			(0.082)			
Automotive *(not evident in sample)*						
Capital Goods				16.557		
				(6749.921)		
Consumer Goods				18.154		
				(6749.921)		
Machinery				15.728		
				(6749.921)		
IT				19.534		
				(6749.921)		
European *(not evident in sample)*						
Asian					16.331	
					(3239.261)	
North American					18.545	
					(3239.261)	
Employees (log)						-0.162
						(0.196)
Constant	-5.944*	-28.062**	-14.845**	-25.874	-24.322	-4.467
	(3.108)	(13.183)	(7.414)	(6749.923)	(3239.265)	(3.286)
Observations	74	74	60	74	74	73
Pseudo R^2	0.142	0.444	0.566	0.350	0.325	0.158

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

Table 8: Logit regression models for production volume decrease in China

that almost half the decisions to divest in China are shifts to ASEAN countries we can conclude that at least a part of the divestments are shifts to the next low-labor-cost location offshore. We find further support for this interpretation as selected costs seem to be of importance for decisions to divest in China. Not only is *labor cost* rated the most important driver (Table 15: $\mu = 4.13$) but also *energy & fixed cost* proves significant in one of the model specifications (Table 8-II: $\beta = 0.769$, $p = 0.076$). This finding is in line with the recent reporting or erosion of China's total manufacturing cost advantage over developed economies (Sirkin et al. 2014).

4.4 Production In- and Divestments in North America

Our sample does not find evidence for large-scale reshoring by North American firms. Yet, Figure 1 shows North America to have a surplus of investments over divestments, which is unique among the developed economies. This phenomenon seems to be largely driven by market considerations. Table 15 shows that *market changes* is the most important driver for these decisions (Table 15: $\mu = 4.29$). At the same time *proximity* proves significant in all regression model specifications (Table 9-I-VI: $0.852 \leq \beta \leq 1.051$, $0.034 \geq p \geq 0.013$) outlined in Table 9. The likelihood to invest in North America increases with the share of local sales volume (Table 9-III: $\beta = 0.030$, $p = 0.073$), which corroborates the notion of market-driven investments.

As a second important driver we identify *innovation*, the ability to develop products that meet market demand. It is significant in all but one regression model (Table 9-I, II, IV-VI: $0.659 \leq \beta \leq 0.742$, $0.058 \geq p \geq 0.038$). Firms likely seek proximity of manufacturing to customers and/or R&D facilities in North America to leverage their full innovation potential. This aligns with the thesis of Pisano and Shih (2012) that separating manufacturing and R&D impairs the innovation capabilities of a firm.

Unlike *proximity* and *innovation*, *supply* does not seem to be important for decisions to invest in North America. In the regression models *supply* is significant with a negative effect in five model specifications (Table 9-I, II, IV-VI: $-0.665 \leq \beta \leq -0.635$, $0.096 \geq p \geq 0.081$). We can assume that the firms that increase production volume already have a supply base in North America so that *supply* is not critical for the reported decisions.

Despite recent reports about North America's resurgence in manufacturing cost competitiveness, especially vis-a-vis China, we find that certain costs do not play a crucial role in investment decisions in North America. *Energy & fixed cost* is not significant in any of the model specifications nor are any of the cost types mentioned among the important decision drivers. *Energy cost* is even rated as the least important driver (Table 15: $\mu = 2.18$) despite the cheap gasoline made available by fracking.

Unlike the study by Ellram et al. (2013) we do not find that government *policies & risk* encourage firms to move production to North America (Table 9-I-VI: $\beta \leq -0.090$). Not only is there no significant relationship in any of the regression model specifications but the observed effect is also negative. If anything, our sample reports that government policies and risk discourage investment in North America. We also do not find that firms of any specific industry, region, or size are more or less likely to invest in production in North America. North American firms are thus not more likely to reshore.

	I	II	III	IV	V	VI
Policy & Risk	-0.200	-0.206	-0.090	-0.096	-0.096	-0.183
	(0.318)	(0.318)	(0.347)	(0.346)	(0.351)	(0.323)
Innovation	0.705**	0.742**	0.508	0.659*	0.695*	0.665*
	(0.345)	(0.359)	(0.360)	(0.348)	(0.356)	(0.344)
Energy & Fixed Cost	0.031	0.046	0.006	0.069	0.096	0.034
	(0.119)	(0.130)	(0.130)	(0.127)	(0.130)	(0.121)
Agility	-0.192	-0.169	-0.140	-0.164	-0.321	-0.191
	(0.307)	(0.331)	(0.357)	(0.331)	(0.346)	(0.325)
Supply	-0.636*	-0.652*	-0.602	-0.635*	-0.665*	-0.655*
	(0.364)	(0.391)	(0.390)	(0.373)	(0.388)	(0.381)
Proximity	0.852**	0.980**	0.975**	1.051**	1.043**	0.904**
	(0.359)	(0.426)	(0.460)	(0.434)	(0.422)	(0.383)
Unstable Demand		0.012				
		(0.424)				
R&D Intensive Components		-0.155				
		(0.365)				
Automated Production		-0.145				
		(0.346)				
Craftsmanship Products		-0.150				
		(0.350)				
High Value Products		0.282				
		(0.433)				
Local Sales			0.030*			
			(0.017)			
Local Production			0.000			
			(0.013)			
Automotive				0.528		
				(0.968)		
Capital Goods				-0.354		
				(0.965)		
Consumer Goods				-0.743		
				(1.088)		
Machinery				-1.331		
				(1.160)		
IT						
(not evident in sample)						
European					16.178	
					(1854.156)	
Asian					16.028	
					(1854.156)	
North American					16.628	
					(1854.156)	
Employees (log)						0.107
						(0.150)
Constant	-1.742	-1.728	-2.488	-2.096	-18.123	-2.612
	(1.982)	(3.353)	(2.232)	(2.199)	(1854.157)	(2.462)
Observations	74	74	60	74	74	73
Pseudo R^2	0.210	0.226	0.254	0.246	0.258	0.215

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

Table 9: Logit regression models for production volume increase in North America

While 23% of our sample reports investment in North America, another 16% chose to divest. These firms seem to be motivated by supply chain related factors. *Agility* is the only factor that turns out

	I	II	IV	V	VI
Policy & Risk	-0.140	-0.399	-0.266	-0.128	-0.452
	(0.273)	(0.391)	(0.326)	(0.331)	(0.364)
Innovation	-0.385	-0.460	-0.498	-0.519	-0.334
	(0.311)	(0.405)	(0.340)	(0.338)	(0.299)
Energy & Fixed Cost	-0.181	-0.247	-0.161	-0.105	-0.230
	(0.130)	(0.162)	(0.135)	(0.148)	(0.149)
Agility	0.467	1.096*	0.545	0.123	0.542
	(0.345)	(0.592)	(0.413)	(0.411)	(0.393)
Supply	0.321	0.215	0.423	0.511	0.318
	(0.303)	(0.434)	(0.343)	(0.351)	(0.329)
Proximity	0.039	-0.006	-0.139	0.296	-0.008
	(0.320)	(0.414)	(0.420)	(0.370)	(0.370)
Unstable Demand		-1.369**			
		(0.582)			
R&D Intensive Components		-0.698			
		(0.464)			
Automated Production		0.747			
		(0.476)			
Craftsmanship Products		-0.043			
		(0.413)			
High Value Products		0.680			
		(0.518)			
Automotive			0.667		
			(1.423)		
Capital Goods			2.828**		
			(1.280)		
Consumer Goods			1.678		
			(1.211)		
Machinery *(not evident in sample)*					
IT			0.868		
			(1.297)		
European				14.645	
				(2689.371)	
Asian				13.543	
				(2689.371)	
North American				16.375	
				(2689.371)	
Employees (log)					0.387*
					(0.224)
Constant	-2.719	-1.225	-3.712	-17.588	-5.613*
	(2.129)	(3.614)	(2.572)	(2689.372)	(3.003)
Observations	74	74	74	74	73
Pseudo R^2	0.106	0.327	0.206	0.245	0.161

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

Table 10: Logit regression models for production volume decrease in North America

significant in at least one of the model specifications shown in Table 10 (Table 10-II: $\beta = 1.096$, $p = 0.064$). At the same time supply chain related factors such as *logistic costs* (Table 15: $\mu = 4.17$), *delivery lead-time* (Table 15: $\mu = 4.00$), and *supply chain flexibility* (Table 15: $\mu = 3.92$) are ranked as most important in the descriptive analysis shown in Table 15. However, production of goods that would arguably benefit the most from agility, i.e., products with *unstable demand*, is significantly less likely to be moved out of North America (Table 10-II: $\beta = -1.369$, $p = 0.019$).

While not highly significant, *policy & risk* (Table 10-I-VI: $\beta \leq -0.128$), *innovation* (Table 10-I-VI: $\beta \leq -0.334$) as well as *energy & fixed cost* (Table 10-I-VI: $\beta \leq -0.105$) have negative effects in the regression model specifications. Hence these factors are more likely to keep firms in North America than to drive them away. Government policies and risk might not attract manufacturing to North America, but they at least may keep firms from offshoring. Similarly, *energy & fixed cost* is not a driving force for investment decisions, but also not the reason why firms leave.

With respect to the type of firms decreasing production in North America, *capital goods* companies show a significantly higher likelihood (Table 10-IV: $\beta = 2.828$, $p = 0.027$) as do larger firms with more *employees* (Table 10-VI: $\beta = 2.828$, $p = 0.027$). A firm's origin, however, does not significantly impact the decisions reported by our sample.

4.5 Production In- and Divestments in Western Europe

Western Europe is one of only two regions in our study with a net decrease of production volume. While 24% of the firms report of divestment, only 19% report an increase in production volume. For the latter decisions the results of the regression models remain inconclusive regarding the drivers. Yet, as for investment decisions in North America, this is not due to *supply*. *Supply* is negatively significant in all model specifications outlined in Table 11 (Table 11-I-VI: $-0.990 \leq \beta \leq -0.735$, $0.080 \geq p \geq 0.026$) suggesting that firms which invest in Western Europe do not see a sufficient supply base as a constraint.

While not significant, the effect of *energy & fixed cost* is negative in most of our model specifications and relatively small in all of them (Table 11-I, II, IV-VI: $-0.109 \leq \beta \leq 0.054$). Thus, while *energy & fixed cost* is certainly not a driver for investments in Western Europe it is also not a deal breaker. At the same time the effects of *proximity* are relatively large and positive (Table 11-I-VI: $\beta \leq 0.178$). Proximity-seeking firms are more inclined to invest in Western Europe than not, which is in line with the still large demand many firms in our sample see in Europe.

While the concrete drivers remain unclear, products for which the production process is highly *automated* are more likely to be shifted to Western Europe (Table 11-II: $\beta = 0.667, p = 0.082$). Also, the higher the share of *local production* the higher the likelihood of increasing production in Western Europe (Table 11-III: $\beta = 0.020, p = 0.077$). Firms must thus invest in Western Europe either in familiar regions or even in existing facilities. The latter interpretation is more plausible as we see that firms mostly invest in automated production, a type of operation usually associated with high fixed costs. This might consequently justify investments in a region with otherwise weak manufacturing cost competitiveness.

For the 24% of firms that decided to decrease production volume in Western Europe two flows dominate: 67% of these firms shifted production to China and 61% from Western to Eastern Europe.

	I	II	III	IV	V	VI
Policy & Risk	-0.271	-0.395	0.082	-0.265	-0.113	-0.286
	(0.295)	(0.353)	(0.414)	(0.304)	(0.315)	(0.302)
Innovation	-0.152	-0.321	0.084	-0.095	-0.209	-0.173
	(0.297)	(0.341)	(0.373)	(0.324)	(0.318)	(0.296)
Energy & Fixed Cost	-0.048	-0.109	0.054	-0.064	-0.032	-0.058
	(0.112)	(0.131)	(0.154)	(0.122)	(0.116)	(0.114)
Agility	0.074	0.071	-0.059	0.058	0.082	0.075
	(0.306)	(0.330)	(0.359)	(0.333)	(0.330)	(0.318)
Supply	-0.753**	-0.990**	-0.745*	-0.776**	-0.767**	-0.805**
	(0.354)	(0.443)	(0.426)	(0.389)	(0.370)	(0.382)
Proximity	0.343	0.394	0.178	0.360	0.507	0.358
	(0.283)	(0.313)	(0.431)	(0.308)	(0.331)	(0.287)
Unstable Demand		-0.023				
		(0.452)				
R&D Intensive Components		0.316				
		(0.343)				
Automated Production		0.667*				
		(0.384)				
Craftsmanship Products		-0.265				
		(0.386)				
High Value Products		0.683				
		(0.506)				
Local Sales			0.021			
			(0.022)			
Local Production			0.020*			
			(0.012)			
Automotive				-0.699		
				(1.316)		
Capital Goods				-0.760		
				(1.271)		
Consumer Goods				0.392		
				(1.067)		
Machinery				1.082		
				(0.913)		
IT *(not evident in sample)*						
European					16.410	
					(1784.962)	
Asian					15.019	
					(1784.962)	
North American					15.467	
					(1784.962)	
Employees (log)						0.080
						(0.148)
Constant	0.538	-1.211	-1.331	0.384	-15.587	0.085
	(1.818)	(3.333)	(2.458)	(2.006)	(1784.963)	(2.045)
Observations	74	74	60	74	74	73
Pseudo R^2	0.161	0.246	0.296	0.213	0.232	0.163

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

Table 11: Logit regression models for production volume increase in Western Europe

Some firms decided to do both. Our regression models are inconclusive about what drives these decisions, but what might have held these firms back? In the various model specifications *innovation*

	I	II	III	IV	V	VI
Policy & Risk	-0.461*	-0.468*	-0.279	-0.484*	-0.260	-0.392
	(0.258)	(0.265)	(0.318)	(0.264)	(0.273)	(0.264)
Innovation	-0.554*	-0.613**	-0.566*	-0.564*	-0.688**	-0.576**
	(0.287)	(0.310)	(0.319)	(0.292)	(0.305)	(0.293)
Energy & Fixed Cost	-0.121	-0.112	-0.117	-0.124	-0.112	-0.106
	(0.105)	(0.116)	(0.119)	(0.108)	(0.111)	(0.105)
Agility	0.070	0.015	-0.089	0.061	0.027	-0.003
	(0.273)	(0.283)	(0.331)	(0.287)	(0.297)	(0.284)
Supply	0.155	0.255	0.218	0.190	0.194	0.201
	(0.267)	(0.298)	(0.285)	(0.273)	(0.269)	(0.269)
Proximity	0.290	0.288	0.304	0.265	0.473	0.310
	(0.270)	(0.320)	(0.320)	(0.302)	(0.309)	(0.270)
Unstable Demand		0.199				
		(0.381)				
R&D Intensive Components		0.065				
		(0.318)				
Automated Production		0.203				
		(0.312)				
Craftsmanship Products		0.213				
		(0.307)				
High Value Products		0.033				
		(0.326)				
Local Sales			0.016			
			(0.015)			
Local Production			0.015			
			(0.011)			
Automotive				0.386		
				(0.865)		
Capital Goods				0.820		
				(0.978)		
Consumer Goods *(not evident in sample)*						
Machinery				0.354		
				(0.850)		
IT				0.271		
				(1.043)		
European					15.755	
					(1635.364)	
Asian					13.981	
					(1635.364)	
North American					15.070	
					(1635.364)	
Employees (log)						-0.095
						(0.131)
Constant	0.211	-1.672	-0.584	-0.018	-15.129	0.964
	(1.606)	(2.896)	(1.774)	(1.681)	(1635.365)	(1.817)
Observations	74	74	60	74	74	73
Pseudo R^2	0.111	0.130	0.187	0.121	0.183	0.120

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

Table 12: Logit regression models for production volume decrease in Western Europe

(Table 12-I-VI: $-0.688 \leq \beta \leq -0.544$, $0.076 \geq p \geq 0.024$) and *policy & risk* (Table 12-I, II, IV: $-0.484 \leq \beta \leq -0.461$, $0.077 \geq p \geq 0.066$) turn out significant with a negative effect in six and three of the models, respectively. Compared to manufacturing operations, R&D was offshored less over the past years. R&D thus very much occurs close to headquarters, often in developed economies, and not necessarily near the demand. It is therefore understandable that firms that are driven by innovation seek proximity to these R&D facilities and therefore keep manufacturing in Western Europe. Similarly, firms that seek a stable, low-risk manufacturing location with a large domestic market without tariffs within the EU seem to be more inclined to stay in Western Europe than to leave.

As with divestment decisions in North America, *energy & fixed cost* is not necessarily the driving force. While not significant in any model specifications we see that the effect is negative (Table 12-I-VI: $\beta \leq -0.106$) making it even less likely for a firm driven by manufacturing cost to divest in Western Europe.

As with decisions to increase production volume, decisions to divest in Western Europe do not differ by industry, origin, or firm size. Firms are not more inclined to move offshore the production of goods with certain traits.

4.6 Production Investments in Eastern Europe

Eastern Europe has a distinct surplus of decisions to increase production volume (24% of the sample reports an increase, vs. 5% reporting a decrease). The majority of the inflows of production volume comes as shifts from Western Europe. As for in- and divestment decisions in Western Europe, our data analysis is inconclusive regarding the forces driving these investments. In five of the regression model specifications we only find significant coefficients for *policy & risk* (Table 13-I, II, IV-VI: $-0.655 \leq \beta \leq -0.480$, $0.087 \geq p \geq 0.019$). Either firms investing in Eastern Europe are not attracted by the government policies and the risk perception in this region, or they are even deterred from investing due to them.

Contrary to common perception, firms in our sample do not seem to invest in Eastern Europe for particular cost reasons. In fact, the effect of *energy & fixed cost* is – while not significant – even negative in our regression models (Table 13-I-VI: $\beta \leq -0.072$). That is, firms would be even less likely to invest if they are sensitive to these types of cost.

Table 13 shows that firms with a higher current share of their production volume in Eastern Europe are more likely to invest there (Table 13-III: $\beta = 0.215, p = 0.001$). These companies seem to prefer locations in known regions or to increase production in existing plants. Also, smaller firms are more inclined to invest in Eastern Europe (Table 13-VI: $\beta = -0.245, p = 0.076$).

The descriptive results in Table 15 show labor to be an important factor for investment decisions in Eastern Europe. *Labor cost* (Table 15: $\mu = 3.56$) as well as *labor quality and availability* (Table 15: $\mu = 3.56$) are among the most important drivers.

We do not find firms from any specific industry to be more likely to invest in Eastern Europe. Even though the largest inflow of production volume comes from Western Europe the origin of the firm does not significantly impact investment in Eastern Europe.

	I	II	III	IV	V	VI
Policy & Risk	-0.607**	-0.655**	-0.649	-0.587**	-0.480*	-0.499*
	(0.265)	(0.278)	(0.478)	(0.273)	(0.280)	(0.267)
Innovation	0.169	0.065	-0.238	0.177	0.112	0.220
	(0.256)	(0.279)	(0.522)	(0.265)	(0.274)	(0.271)
Energy & Fixed Cost	-0.112	-0.121	-0.154	-0.122	-0.106	-0.072
	(0.101)	(0.113)	(0.176)	(0.107)	(0.106)	(0.105)
Agility	-0.312	-0.459	-0.867	-0.211	-0.375	-0.432
	(0.278)	(0.294)	(0.613)	(0.300)	(0.316)	(0.300)
Supply	-0.183	-0.147	-0.461	-0.198	-0.167	-0.095
	(0.264)	(0.297)	(0.445)	(0.277)	(0.273)	(0.265)
Proximity	0.035	0.042	0.083	-0.042	0.144	0.060
	(0.239)	(0.284)	(0.437)	(0.291)	(0.251)	(0.241)
Unstable Demand		0.661				
		(0.425)				
R&D Intensive Components		0.329				
		(0.334)				
Automated Production		0.006				
		(0.304)				
Craftsmanship Products		0.053				
		(0.312)				
High Value Products		0.310				
		(0.340)				
Local Sales			0.039			
			(0.029)			
Local Production			0.215***			
			(0.066)			
Automotive				0.891		
				(0.945)		
Capital Goods				-0.042		
				(1.074)		
Consumer Goods				-0.463		
				(1.041)		
Machinery				-0.147		
				(0.995)		
IT				-0.510		
				(1.159)		
European					16.905	
					(3294.444)	
Asian					15.140	
					(3294.444)	
North American					16.330	
					(3294.444)	
Employees (log)						-0.245*
						(0.138)
Constant	1.365	-1.258	2.963	1.179	-14.980	3.018*
	(1.518)	(3.080)	(2.480)	(1.656)	(3294.445)	(1.829)
Observations	74	74	60	74	74	73
Pseudo R^2	0.098	0.166	0.538	0.128	0.173	0.137

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

Table 13: Logit regression models for production volume increase in Eastern Europe

	I	II	III	IV	V	VI
Policy & Risk	0.163	0.282	-0.076	0.200	0.018	0.141
	(0.256)	(0.309)	(0.349)	(0.279)	(0.286)	(0.269)
Innovation	0.244	0.157	0.093	0.260	0.380	0.192
	(0.255)	(0.284)	(0.340)	(0.275)	(0.284)	(0.256)
Energy & Fixed Cost	0.196*	0.219*	0.231	0.210*	0.268**	0.181
	(0.112)	(0.128)	(0.150)	(0.118)	(0.125)	(0.113)
Agility	-0.226	-0.305	-0.860**	-0.155	-0.400	-0.272
	(0.271)	(0.313)	(0.430)	(0.301)	(0.345)	(0.291)
Supply	0.097	-0.202	0.452	-0.000	0.086	0.061
	(0.264)	(0.323)	(0.370)	(0.283)	(0.293)	(0.280)
Proximity	0.056	0.148	0.316	0.117	0.055	0.096
	(0.261)	(0.312)	(0.430)	(0.318)	(0.295)	(0.277)
Unstable Demand		0.127				
		(0.373)				
R&D Intensive Components		-0.505*				
		(0.304)				
Automated Production		0.596*				
		(0.313)				
Craftsmanship Products		-0.612*				
		(0.340)				
High Value Products		-0.085				
		(0.339)				
Local Sales			-0.016			
			(0.044)			
Local Production			0.065***			
			(0.024)			
Automotive				1.003		
				(0.906)		
Capital Goods *(not evident in sample)*						
Consumer Goods				1.271		
				(0.852)		
Machinery				0.055		
				(0.904)		
IT				0.684		
				(1.033)		
European					14.258	
					(1219.437)	
Asian					16.157	
					(1219.437)	
North American					15.741	
					(1219.437)	
Employees (log)						0.146
						(0.138)
Constant	-2.152	-5.746*	-1.620	-2.916	-17.154	-2.955
	(1.667)	(3.117)	(2.077)	(1.888)	(1219.438)	(1.970)
Observations	74	74	60	74	74	73
Pseudo R^2	0.054	0.161	0.250	0.091	0.155	0.072

Standard errors in parentheses
** p<0.10, ** p<0.05, *** p<0.01*

Table 14: Logit regression models for production volume increase in Southern Asia

4.7 Production Investments in Southern Asia

Southern Asia, i.e., India and the ASEAN countries, experiences mainly investments but not divestments from the firms in our sample. The investments – about half of which are shifts from China – are to a large degree driven by cost as e*nergy & fixed cost* turns out significant in four of the regression model specifications (Table 14-I, II, IV-VI: $0.196 \leq \beta \leq 0.268$, $0.087 \geq p \geq 0.032$). Also, in the descriptive analysis different cost types are among the drivers ranked as most important in Table 15: *labor costs* (Table 15: $\mu = 3.57$), *logistic costs* (Table 15: $\mu = 3.86$), *raw material costs* (Table 15: $\mu = 4.00$), and *fixed costs* (Table 15: $\mu = 3.71$). Firms apparently leave China for low-labor-cost offshore locations in Southern Asia. Such shifts deemphasize supply chain performance as one model specification shows that agility is less of a concern for decisions to invest in Southern Asia (Table 14-III: $\beta = -0.860$, $p = 0.045$).

Several findings further support the thesis of low-cost offshoring to Southern Asia. These shifts are not primarily for *R&D intensive components* (Table 14-II: $\beta = -0.505, p = 0.097$) or *craftsmanship products* (Table 14-II: $\beta = -0.612, p = 0.072$). *Automated production* is significantly more likely to be shifted to Southern Asia (Table 14-II: $\beta = 0.596, p = 0.057$). This is counterintuitive since China, previously the primary destination for low-cost offshoring, is only starting to automate manufacturing operations (Qi 2015).

The movement to Southern Asia appears to be amplified by existing local production, as firms with higher shares of *local production* are more likely to further increase production in their Southern Asian plants or to set up new facilities there (Table 14-III: $\beta = 0.648$, $p = 0.007$). A firm's origin, industry affiliation, or size does not significantly impact the investment decisions made for Southern Asia.

5 Discussion

Our field study has led to the following seven key insights about the current restructuring of global supply chains:

(1) Companies are currently restructuring their global production footprints. Our research provides evidence that firms from all industries and origins are indeed currently reconfiguring their supply chains on a global scale. This aligns with other research (Chen et al. 2015) and updates the findings from Kinkel (2012) who argues that the production relocation activities of German firms declined over the course of the global economic crisis. From a theoretical perspective this phenomenon can be well described with the eclectic paradigm. Dunning (2000) argues that location decisions are highly contextual and depend upon, among other factors, the comparative advantages offered by the current location and alternative locations. Relocation of production seems natural given the recent changes in the competitive landscape outlined by Sirkin et al. (2014).

(2) The majority of firms engage in offshoring. Reshoring is indeed occurring but not largely for corrective reasons. 76% of our sample offshores production. 32% also reports of reshoring production

to North America and even more to Western Europe and Japan. We confirm that reshoring is indeed a quantifiable phenomenon, as suggested by Kinkel and Maloca (2009), Tate et al. (2014a), and more than a few mainstream press articles. However, contrary to other research (Kinkel and Maloca 2009, Gray et al. 2013, Fratocchi et al. 2014) we cannot support the notion of corrective reshoring as our sample does not cite quality issues or management complexity as primary motives for reshoring. With the most important drivers being proximity to markets and innovation, the reshoring decisions in our sample are better viewed as reactions to changes in the business environment (Martínez-Mora and Merino 2014, Sirkin et al. 2014, Tate et al. 2014b). Even if the paradigms for choosing a location (e.g., pursuit of efficiency) have not changed since the initial offshoring, they may lead to now altogether different decisions.

(3) North America may be at the cusp of a manufacturing renaissance, but not because of reshoring. We find evidence for a return of manufacturing to North America, with more firms investing than divesting. Yet, American firms are not necessarily driving this trend as 60% of the investments in North America come from international companies versus 40% from North American firms. With changes in the competitive landscape and the resurgence of its economy and local demand, North America apparently has become an attractive offshore location for firms from other regions. So while the media's reporting of a North American manufacturing renaissance may be valid, reshoring does not seem to be the most appropriate label. Van den Bossche et al. (2014) also find that the scale of reshoring to North America does not live up to the scale of media attention.

(4) China is still the most attractive region for production sourcing, followed by developing economies in Eastern Europe and Southern Asia. Almost half of our sample invested in production in China while only a few firms divested. Similarly, far more firms are increasing rather than decreasing their production volume in Eastern Europe and Southern Asia, which aligns with the findings of Kinkel and Maloca (2009) and O'Marah and Lee (2013). The latter study also found a decline of China’s attractiveness, however we cannot make such a conclusion since our data is a snapshot of one point in time. In light of its declining manufacturing cost advantage (Sirkin et al. 2014), China's appeal as a production location may now be less about labor costs and more about proximity to an important consumer market. In Ferdows's (1997) classification the China plants are in the midst of a transition from being offshore or source factories with focus only on low production cost, to being server or contributor if not even lead factories focusing on serving the local market. In the language of the eclectic paradigm China appears to be attracting more market-seeking investments while Eastern Europe and Southern Asia attract more efficiency-seeking investments

(5) The decline of manufacturing in developed economies, i.e., Western Europe and Japan, continues. Our sample reports further reductions in manufacturing in Western Europe and Japan. While a substantial share still invests in these regions even more firms are divesting. This mirrors the findings of Chen et al. (2015) and is not surprising since the manufacturing cost differentials between those regions and classical offshore regions in developing economies have not changed dramatically. Firms

prefer to invest in offshore locations if "[…] offshoring is seen chiefly as a cost-saving strategy […]" (Davis and Naghavi 2011).

(6) Labor cost, is no longer the driving force in manufacturing location decisions. Instead, firms make complex trade-offs among a variety of factors. In line with other research (Kinkel and Maloca 2009, Simchi-Levi et al. 2012, Ellram et al. 2013, O'Marah and Lee 2013, Berry and Kaul 2015, Chen et al. 2015, Gray et al. 2015) our sample confirms that firms increasingly move beyond mere labor cost comparisons in manufacturing location decisions. China serves as a prime illustration. While in the past many companies were drawn by the labor cost benefits of offshore production in China, our sample shows that investments in China are now largely market driven.

Production cost is traded off more carefully against factors such as proximity to markets, supply availability, innovation, government policies and risk, which confirms findings by Chen et al. (2015). Consequently, for some trends, e.g., investments in Western Europe, we cannot clearly identify a dominant driver. The eclectic paradigm helps to explain: as the contextual parameter of nations' manufacturing cost competitiveness changes, other location-specific comparative advantages determine if a firm will invest in a given location (Dunning 2000).

(7) Firms localize production in developed economies and use developing economies as production hubs. While our sample does not allow a clear identification of dominant drivers in all cases, we have found a tendency to localize or nearshore production close to demand for investments in developed regions, including China. Developing economies serve mainly as manufacturing hubs that produce for offshore demand. Firms thus invest in higher factor-cost countries that have a local market to serve, but lower-cost countries do not have this prerequisite. O'Marah and Lee (2013) discuss the trade-off between scale and agility. While investments in developing economies add scale, investments in developed regions close to local demand add flexibility. In light of the theory of transactions cost economics, Buckley and Casson (2009) state that flexibility increases transaction costs which in turn discourages offshoring and encourages nearshoring. They further argue that the link to the R&D and marketing functions, which are still largely located at the headquarters in developed economies, further encourages colocation per internalization theory.

Our regression models did not detect any major differences across firms based on industry, origin, or size. The decisions seem to generally depend most strongly on the product.

This research provides a detailed benchmark of decisions made by our sample where to invest for which products, what factors to consider, and which markets to serve. This should be valuable to management teams contemplating changes to their current production footprints. But these insights should be beneficial to others besides supply chain managers. Our study captures the current attractiveness of different regions of the world for manufacturing investments. This can inform the discourse among makers of governmental policies regarding how best to attract manufacturing and, in turn, jobs to their home regions.

Our research documents current production sourcing decisions and their drivers at a level of granularity not available in existing research. However, some caveats are in order. The number of responses (74) creates three limitations. First, our unit of analysis is the individual decision, which enables deep investigation of the driving forces but might not be representative of what these firms do across the board. Discussion with our participants reassured us that these are not outlier decisions, but additional responses from the same organizations would enhance the robustness of our results. Second, as the decisions are diverse and reflect complex trade-offs among numerous factors, our sample size pushes our statistical tests to their limits. Increasing the sample size would allow us to add more granularity to the results. Thirdly, beyond the methodological challenges the sample size makes the generalizability of our results debatable. We believe the conclusions drawn pertain to our sample, which we believe to mirror the global manufacturers' landscape. Yet, we cannot assure that they hold true beyond our sample even though the results are in line with the results of other existing research as outlined in this discussion section.

Beyond the extension of the sample we believe a different perspective on the decisions analyzed in this paper could provide valuable insights. In this paper we analyzed production sourcing decisions region by region. We thereby understand what makes firms invest in one region and divest of another. Yet, this type of analysis makes it hard to identify commonalities among those decisions such as is there general propensity to invest in regions with specific characteristics, e.g. sales growth. In Steuber and Huchzermeier (2016) we take such a perspective and analyze production sourcing decisions in general as well as their impact on firm performance and risk exposure.

Acknowledgements

We acknowledge our industrial partner Avnet for assistance in disseminating the questionnaire. We thank the respondents for their non-trivial efforts ingathering and sharing the data that enabled our detailed analyses. We especially acknowledge the company representatives who participated in our roundtable meetings in San Francisco, CA, and Washington, DC. The discussions during those occasions were provided us invaluable context and direction.

Appendix

Factor	Driver Variable	Offshoring			Reshoring			Increase in CN			Decrease in CN			Increase in NAM			Decrease in NAM			Increase in WEU			Decrease in WEU			Increase in EEU			Increase in SA		
		μ	SD	RM	μ	SD	RM	μ	SD	RM	μ	SD	RM	μ	SD	RM	μ	SD	RM	μ	SD	RM	μ	SD	RM	μ	SD	RM	μ	SD	RM
Policy & Risk	Political Stability	3.00	0.16	13	3.13	0.21	12	2.94	0.20	16	3.63	0.38	10	3.14	0.27	8	2.50	0.32	16	3.06	0.30	16	2.92	0.42	11	2.61	0.29	19	3.14	0.26	14
	Government Regulations	2.88	0.16	16	2.79	0.21	19	2.94	0.20	16	3.75	0.37	8	2.71	0.29	18	2.56	0.27	15	2.76	0.24	21	2.75	0.37	15	2.28	0.27	23	2.86	0.34	17
	Natural Disasters	2.61	0.14	23	2.58	0.19	22	2.61	0.17	21	2.88	0.30	20	2.64	0.31	21	2.44	0.30	18	2.71	0.28	22	2.67	0.36	16	2.33	0.28	22	2.86	0.34	17
	Exchange Rate Volatility	2.88	0.15	16	2.92	0.18	17	2.88	0.20	18	3.50	0.33	12	2.86	0.21	15	2.83	0.31	12	3.06	0.23	16	2.83	0.27	13	2.67	0.26	17	3.14	0.34	14
	Government Incentives	2.84	0.17	19	2.58	0.23	22	3.00	0.22	13	3.38	0.42	13	2.57	0.34	22	2.39	0.26	19	2.65	0.26	23	2.33	0.36	22	2.17	0.27	24	3.29	0.47	13
	Public Infrastructure	3.07	0.13	11	2.75	0.17	21	3.30	0.15	9	3.38	0.38	13	2.93	0.22	13	2.61	0.28	14	2.82	0.25	19	2.92	0.36	11	2.67	0.27	17	3.43	0.30	11
Innovation	Time to Launch a new Product	2.88	0.16	16	3.04	0.24	14	3.00	0.21	13	2.75	0.45	22	2.71	0.30	18	2.39	0.29	19	3.24	0.29	12	2.58	0.36	19	2.78	0.29	14	2.86	0.26	17
	Innovation & Design Capability	2.93	0.15	14	3.25	0.24	9	3.00	0.17	13	2.88	0.40	20	3.00	0.30	10	2.50	0.27	16	3.47	0.30	6	2.67	0.36	16	2.78	0.29	14	2.57	0.20	24
	Environmental Sustainability	2.73	0.13	21	2.79	0.18	19	2.70	0.17	20	3.13	0.30	17	2.57	0.25	22	2.33	0.29	22	2.94	0.25	18	2.83	0.37	13	2.72	0.27	16	2.86	0.34	17
	IP Protection	3.09	0.14	10	3.00	0.21	15	3.15	0.19	12	3.38	0.26	13	2.93	0.30	13	2.94	0.29	11	3.18	0.26	13	2.67	0.40	16	3.06	0.25	11	3.00	0.31	16
	Management Complexity	2.89	0.14	15	3.08	0.18	13	2.61	0.17	21	3.00	0.27	18	2.86	0.23	15	2.39	0.28	19	3.29	0.24	10	2.50	0.38	20	2.89	0.27	13	2.71	0.36	22
	Automation & Techn. Advancem.	2.70	0.15	22	2.96	0.21	16	2.61	0.18	21	3.00	0.46	18	2.79	0.33	17	2.22	0.30	24	3.18	0.27	13	2.17	0.39	24	2.61	0.29	19	2.71	0.36	22
	Product Quality	3.93	0.13	1	3.88	0.20	2	3.88	0.18	2	4.00	0.33	4	3.79	0.24	1	3.61	0.31	4	4.18	0.21	2	3.83	0.32	4	3.72	0.29	2	4.14	0.34	2
Energy & Fixed Cost	Energy Costs	2.43	0.14	24	2.29	0.20	24	2.58	0.18	24	2.75	0.25	22	2.14	0.29	24	2.28	0.27	23	2.18	0.27	24	2.33	0.38	22	2.39	0.26	21	3.43	0.30	11
	Fixed Costs	3.29	0.15	9	3.29	0.24	8	3.18	0.19	11	3.25	0.41	16	3.29	0.34	7	3.61	0.24	4	3.29	0.27	10	3.50	0.42	7	3.39	0.30	5	3.71	0.47	8
Agility	Delivery Lead Time	3.63	0.15	4	3.54	0.23	3	3.70	0.20	5	3.75	0.37	8	3.71	0.32	3	3.83	0.26	1	3.53	0.29	5	4.00	0.17	2	3.33	0.27	7	4.14	0.14	2
	Supply Chain Flexibility	3.59	0.15	5	3.50	0.23	5	3.58	0.21	6	3.63	0.26	10	3.79	0.28	1	3.39	0.33	8	3.71	0.24	3	3.92	0.31	3	3.39	0.31	5	4.14	0.26	2
Supply	Raw Material Costs	3.05	0.18	12	2.83	0.25	18	3.24	0.25	10	3.88	0.35	7	2.71	0.32	18	3.28	0.39	10	2.82	0.33	19	3.08	0.48	10	3.11	0.37	10	4.00	0.38	5
	Supply Availability	3.59	0.14	5	3.38	0.20	6	3.73	0.18	4	4.13	0.23	1	3.14	0.25	8	3.50	0.31	6	3.41	0.27	8	3.67	0.28	5	3.33	0.32	7	3.71	0.52	8
	Logistics Costs	3.64	0.13	3	3.33	0.18	7	3.76	0.15	3	4.00	0.38	4	3.57	0.20	5	3.78	0.22	3	3.35	0.21	9	4.17	0.24	1	3.33	0.26	7	3.86	0.26	7
Proximity	Market Changes	3.86	0.15	2	3.92	0.22	1	4.03	0.17	1	4.13	0.13	1	3.71	0.30	3	3.83	0.33	1	4.29	0.17	1	3.58	0.36	6	3.83	0.33	1	4.43	0.30	1
	ASS Quality	2.75	0.16	20	3.21	0.26	10	2.76	0.20	19	2.50	0.38	24	3.00	0.35	10	2.83	0.33	12	3.47	0.29	6	2.50	0.29	20	3.00	0.32	12	2.86	0.26	17
	Labor Costs	3.54	0.14	8	3.17	0.21	11	3.48	0.19	8	4.13	0.44	1	3.00	0.28	10	3.50	0.32	6	3.12	0.24	15	3.42	0.42	8	3.56	0.28	3	3.57	0.43	10
n.a.	Labor Quality & Availability	3.59	0.14	5	3.54	0.22	3	3.55	0.19	7	4.00	0.33	4	3.50	0.29	6	3.39	0.31	8	3.65	0.27	4	3.25	0.39	9	3.56	0.26	3	4.00	0.38	5

Table 15: Mean (μ), standard deviation (SD), rank of means (RM) of driver variables for decisions to off- and reshore production, increase production volume in China (CN), North America (NAM), Western Europe (EEU), Eastern Europe (EEU), and Southern Asia (SA)

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