Firm-Level Determinants of GVC Positioning and Span: Evidence from the Netherlands

[INCOMPLETE – DO NOT CIRCULATE]

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Abstract

This paper investigates the determinants of Global Value Chain (GVC) positions and spans among Dutch firms using microdata from Statistics Netherlands covering the period from 2015 to 2020. We assess how productivity, firm size, age, and capital intensity influence a firm's role within GVCs by employing a modified version of the Chor et al. (2021) metrics of import upstreamness, export upstreamness, and GVC span. Our analysis reveals that firms that become more productive, larger, and more experienced, tend to expand their GVC span, indicating a positive correlation between productivity and operational span within GVCs.

1. Introduction

Over recent decades, the world economy has become increasingly globalized due to new technologies like container shipping and the internet, and policy developments like the expansion of the WTO. While this trend has not reversed, it has broadly stagnated since the early 2010s, and come under some pressure more recently due to geopolitical rivalries. Globalization was accompanied by the rise of global value chains (GVCs). Goods and services consumed worldwide are nowadays often produced in complex value chains that can span across many countries due to international trade in intermediate services and goods. In today's GVC economy, firms compete internationally by specializing in the provision of one or several steps within a value chain.

The position that firms occupy within GVCs, i.e. whether they are operating close to final demand ('downstream'), or relatively close to the source of value added ('upstream'), is interesting to study for several reasons. First, different positions in the value chain may enable firms to extract more or less value.[1] Second, different positions within GVCs may expose firms differentially to different kinds of demand and supply shocks. More generally, adapting their positions within GVCs may be a natural way for firms to adapt to changing market circumstances.

Firms not only occupy certain positions within GVCs, but they also perform a certain number of *stages of production* within them ('GVC span'). When a firm chooses its operational span within GVCs, it faces a trade-off. If it takes on an extra stage of production, it is likely to be able to operate with better prices (i.e. lower prices for intermediate input, or higher prices for outputs). At the same time, internalizing more stages of production will likely increase its costs of production, and potentially counteract gains from specialization. Chor et al. (2021) show that Chinese firms tend to become more upstream and operate with larger GVC spans as they become more productive. Does the same result hold for firms in advanced economies?

This paper studies the drivers of firm-level GVC position and span, using microdata on Dutch firms between 2015 – 2020, provided by Statistics Netherlands. We use a slightly modified version of the Chor et al. (2021) measures of import upstreamness, export upstreamness, and GVC span to measure the position and operational span of firms within GVCs. Our results indicate that firms that become more productive, larger, and more experienced, tend to increase their operational span. This result is broadly in line with results reported by Chor et al. (2021) for Chinese firms. This implies that Dutch firms, as they become more productive, expand their operations by performing a larger measure of stages in-house. In contrast with results in Chor et al., we find suggestive evidence that firms in the Netherlands decrease their export upstreamness, as well as their import upstreamness as they grow more productive, suggesting that participation and competition within GVCs may differ by region.

1.1. Related Literature

This section reviews the related literature on several questions: i) How do GVCs more generally influence firm-level outcomes like productivity, growth, profitability, employment, and wages?, ii)

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[1] See e.g. Shih (1996), who is credited with having invented the notion of a 'smile curve', the idea that most value within GVCs is located at the beginning, and the end of it, respectively.

What are the determinants of firm-level GVC position and span?, and iii) How do GVC position and span impact other firm choices and firm-level outcomes?

The production of manufactured goods has become an increasingly globalized process over recent decades (Antràs & Chor, 2022). This is typically explained with a combination of technological factors, such as inventions in information and communication technology (ICT) and the rise of container shipping, as well as policy-related factors, like the free-trade agreements under the WTO and China becoming a more free market-oriented society (Baldwin, 2019). Globalization was on the rise until the early 2010s, and with it GVCs. GVCs became longer until around 2012, and then plateaued or retracted. More recently, events like the Covid-19 pandemic, and geopolitical tensions have put world trade under further strain.

Several recent papers have studied the drivers of GVC participation (Fernandes et al., 2022; Ignatenko et al., 2019; Urata & Baek, 2020; World Bank, 2020). This literature finds that GVC participation is driven, among other factors, by economic size, factor endowments, geographic proximity, trade and investment policies, presence of foreign multinationals, labour productivity, R&D investments, institutional frameworks, and domestic industrial capacity.

The consequences of GVC participation for economic growth at the country-level has drawn a lot of attention from researchers. World Bank (2020) provides evidence of the positive impact of GVC participation on economic growth across a large sample of countries. The study shows that a 1% increase in GVC participation is associated with a more than 1% increase in per capita income in the long run. This relationship is stronger for countries involved in both forward and backward linkages in GVCs, indicating that the benefits of GVCs are larger when countries engage in multiple stages of production rather than merely exporting raw materials. Pahl and Timmer (2020) also find that GVC participation significantly boosts productivity, especially for countries further from the technological frontier. Their analysis suggests that GVCs allow developing countries to specialize in specific production tasks, enhancing their productivity through learning and technology transfer from more advanced economies. However, they also caution that the employment effects of GVC participation are mixed, with little evidence of substantial job creation in the formal manufacturing sector .

Several studies have studied how participation in GVCs at the firm-level impacts productivity. The literature generally reports positive influences (Altomonte et al., 2018; Antràs & Chor, 2022; Banh et al., 2020; Constantinescu et al., 2019; Criscuolo & Timmis, 2017; World Bank, 2020). GVCs are thought to enable productivity gains via several mechanisms. In general, GVCs enable countries and firms to specialize in specific stages of production where they have comparative advantage (Baldwin & Robert-Nicoud, 2014; Grossman & Rossi-Hansberg, 2008). GVCs may further facilitate the transfer of technology and knowledge between the involved firms, e.g. from multinational corporations to local firms (Ayerst et al., 2023; Banh et al., 2020; Javorcik, 2004; Merlevede & Theodorakopoulos, 2021; Rachapalli, 2021, 2024). This transfer occurs through various channels, including the import of high-quality intermediate inputs and direct assistance from lead firms within the value chain.

While GVCs are generally associated with increased productivity, their impact on employment and wages is more nuanced (Szymczak, 2024). For instance, employment may be positively or negatively affected, depending on whether production stages relocated to or from a given country, but also by how capital intensive a given production stage is under GVC production. Furthermore, it is not a priori obvious, how GVC participation influences the bargaining power of workers.

Besides studying the impact of GVC participation, the position that countries/industries/firms inhabit within GVCs has attracted attention from academics and policy makers. *GVC position* here refers to the types of products that countries/industries/firms use and produce, as well as the kinds of activities that they are carrying out. Interest in GVC position is driven by the idea that different parts of the value chain enable firms to extract more or less value. The idea that firms at the beginning (e.g. raw materials and R&D) and at the end (e.g. sales and marketing) are able to extract more value than firms in the middle (e.g. production) of the value chain is often referred to as the "smile curve hypothesis" (Shih, 1996). The literature has produced some supportive evidence of the smile curve hypothesis (Baldwin & Ito, 2021; Mahy et al., 2022; Rungi & Del Prete, 2018; Timmer et al., 2019). Furthermore, Kim & Qureshi (2020) show that the differences between different parts of the smile curve are increasing. De Vries et al. (2021) find no strong evidence on the relationship between GVC position and productivity for their sample of roughly 600 larger firms in the Netherlands observed in 2012 and 2017. The early literature on positions within GVCs has primarily focused on measuring the position of country-industries (Antràs et al., 2012; Antràs & Chor, 2022; Chor, 2019; Fally, 2012; Koopman et al., 2014). This literature has produced and studied the now commonly used measures of upstreamness (proximity to final demand) and downstreamness (proximity to the sources of value added).

A recent literature uses measures of GVC position at the firm-level (Alfaro et al., 2019; Chor et al., 2021; de Vries et al., 2021; Mahy et al., 2022). Ju and Yu (2015) are the first to apply the Antràs et al. (2012) country-industry level measure of upstreamness to firm-level export data. Chor et al. (2021) build on this paper, and propose a more general way of measuring the position that a firm occupies within GVCs. This measure is a hybrid measure of GVC position, combining information from ICIO tables with information on firm-level trade. In particular, they propose to combine information on product-level imports and exports of firms with information on the upstreamness of industries related to those products in order to derive a measure of export- and import-upstreamness at the firm-level, as well as the GVC span (by taking the difference between export- and import-upstreamness).

A few papers study the predictors of GVC position at the country level. Antràs et al. (2012) observe a cross-section of 120 countries, and find that credit-to-GDP ratios and schooling are the only conditionally significant predictors of upstreamness (both with a negative sign). They also find that GDP per capita, rule of law, and capital intensity are not estimated to be statistically significant once controlling for the other two variables. Antràs and de Gortari (2020) study a model of the geography of GVCs. The model predicts that more central stages of production will tend to be more downstream, which they confirm empirically. Fally and Hillberry (2018) propose a model of firms in global value chains. Firms in this model face a key trade-off: taking on an extra task in the value chain saves on transaction costs with the other firm, but production within the firm itself is subject to diseconomies of scope. Fally and Hillberry assume that the strength of these diseconomies, as well as firm-to-firm transaction costs differ across countries. Since transaction costs have relatively larger effects downstream, countries with relatively low diseconomies of scale will tend to be downstream, and have firms with larger spans of production.

Several papers empirically study the *determinants of GVC positions at the firm level*. Chor et al. (2021) study a sample of 56,282 Chinese firms that are active in both importing and exporting between 2000 and 2006. They find that firms that become more productive, bigger, or more experienced, also increase the upstreamness of their imports, while keeping the upstreamness of exports unchanged,

and increasing their GVC span. The authors rationalize these findings with a partial equilibrium model of firms producing within a global value chain. In this model, firms face a trade-off when choosing their export- and import-upstreamness: taking on an extra stage of production increases revenues (export-upstreamness) or decreases costs (import-upstreamness), while increasing fixed and variable costs of production by one extra production stage. The authors show conditions under which higher productivity is always associated with larger GVC spans. Boehm and Oberfield (2020) study a sample of Indian plants and show that plants operating in areas subject to more congested courts (leading to more costly inter-firm contract enforcement) tend do have larger vertical spans (analogous to GVC spans in this setting). Similarly, Alfaro et al. (2019) study a sample of globally operating firms, and show that firms operating in markets with high elasticity of demand (i.e. low market power of the firm) tend to buy (rather than integrate) upstream inputs. They further show that the contractibility of goods along the value chains influences firms' outsourcing decisions, and that more productive firms have larger GVC spans.

The literature reports mixed results on the relation between GVC position and other firm-choices and outcomes. Ju and Yu (2015) study a sample of Chinese firms in 2000 – 2006, and find that upstream firms are more capital-intensive, and that both productivity and profitability rise in upstreamness. Chor et al. (2021) also study Chinese firms in 2000 – 2006, and find that firms that increase their GVC span also see increases in value added in production, total input purchases, total wage bill (relative to sales), fixed costs, assets, and profits. De Vries et al. (2021) on the other hand do not find a significant relationship between upstreamness and productivity in a sample of Dutch firms in 2012 and 2017. These authors do, however, report some evidence that profitability in rises with firms being more downstream. Mahy et al. (2022), studying Belgian firms between 2002 and 2010, find that productivity, wage costs, and profitability rise with upstreamness. The authors also show evidence of a non-linear relationship: productivity rises more at higher levels of upstreamness.

2. Data

We use microdata on firms in the Netherlands, provided by Statistics Netherlands in a secure microdata environment. Our dataset merges two custom firm-level datasets: one on the GVC position of firms, and another one on productivity measures of firms, along with other firm characteristics like industry, age, capital, labour (FTE), use of intermediate inputs and sales. The merged dataset contains 16,242 distinct firms and 70,827 firm-year observations, covering the period of 2015-2020. The data allows us to observe each firm's GVC position and span and relate this to its productivity and other characteristics.

Firm level value chain positions (as provided by Statistics Netherlands) are computed in a two-step procedure, similar to Chor et al. (2021). First, country-industry-year level upstreamness measures of the 'distance' (i.e. number of production steps) of a given country-industry from final demand are computed with the FIGARO multi-region input-output tables. Compared to Antràs et al. (2012), this has the advantage that distance to final demand for imports and exports can be estimated using multi-region input-output tables instead of having to rely on national input-output tables and extra assumptions.. Second, these values are multiplied with the observed imports and exports at the firm-

level.[2] Observed firm-level imports and exports of products are mapped to industry-level upstreamness measures via the CPA classification. The final values are weighted averages of import upstreamness (U_I), and export upstreamness (U_X), respectively, at the firm-year level. The firm's GVC span is calculated as the difference between import upstreamness and export upstreamness of the firm in a given year.

Figure 1 presents a stylized illustration of a firm within a global value chain. We characterize a firm by its import upstreamness (U_I), i.e. the average distance of its imports from final demand, and its export upstreamness (U_X), i.e. the average distance of its exports from final demand. For example, a good like raw iron has a relatively high upstreamness, because it will typically take several steps of transformation before iron reaches the final consumer. Iron screws, on the other hand, have a lower upstreamness than iron, since fewer steps will typically be taken before a screw reaches the final consumer. Note that it will typically be the case that each step of transformation within a GVC (e.g. from iron to screw) will impose a cost on the firm carrying it out, but will also add value to the product, meaning that goods will increase in price as they get closer to the final consumer. The difference between a firm's import upstreamness and its export upstreamness is called the firm's GVC span. This is a measure of the firm's operational span within GVCs. For instance, a firm that imports , say, raw iron and exports screws would have a relatively small GVC span, whereas a firm importing raw iron and exporting automobiles would have a large GVC span.

Figure 1: GVC Position and Span of Firm i
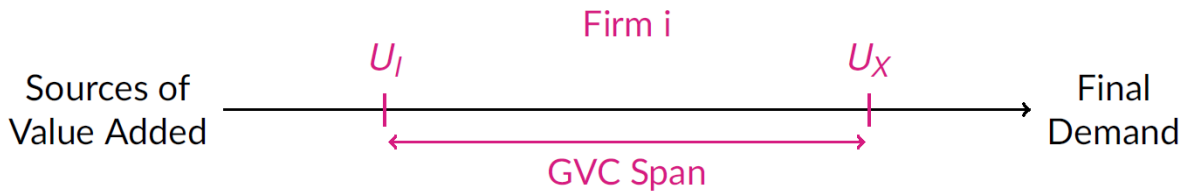
We use three different measures of firm-level productivity. First, labour productivity is calculated as the ratio of firm-level value added to the number of full-time employees. Second, we use the Ackerberg et al. (2015) (ACF henceforth) approach to measure TFP via a control function approach. Third, we use a measure of TFP based on a growth-accounting-style Solow residual based on a Cobb-Douglas production function.[3]

Table 1 contains descriptive statistics on the matched sample. Figures 2 – 4 plot the evolution of average import upstreamness, export upstreamness, and GVC span per year across the sample.

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[2] Observed firm-level import and export flows are purged of re-exports, a type of international trade that is particularly common in the Netherlands, and might otherwise bias the results of the empirical analysis.

[3] Both TFP measures are computed and provided by Statistics Netherlands.

Table 1: Descriptive Statistics

Variable	Observations	Mean	SD
Import Upstreamness U_I	70,827	2.42	0.47
Export Upstreamness U_X	70,827	2.38	0.50
GVC Span	70,827	0.05	0.46
$\log(Prod_{acf})$	69,934	10.49	0.78
$\log(Prod_{ga})$	69,934	9.16	1.26
$\log(Prod_{lab})$	70,775	11.46	0.72
$log(K/L)$	69,983	10.44	1.50
$log(Sales)$	69,089	16.21	1.59
$log(Age)$	70,827	3.03	0.77

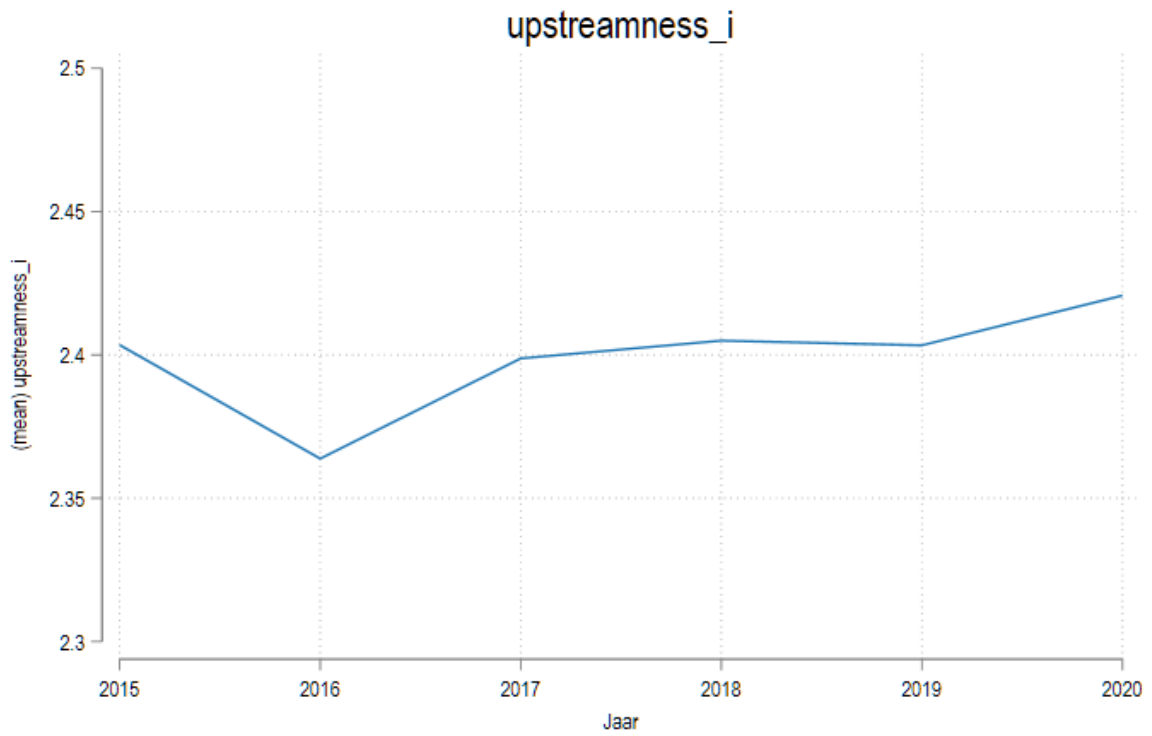**Figure 2: Import Upstreamness (U_I), 2015 – 2020**

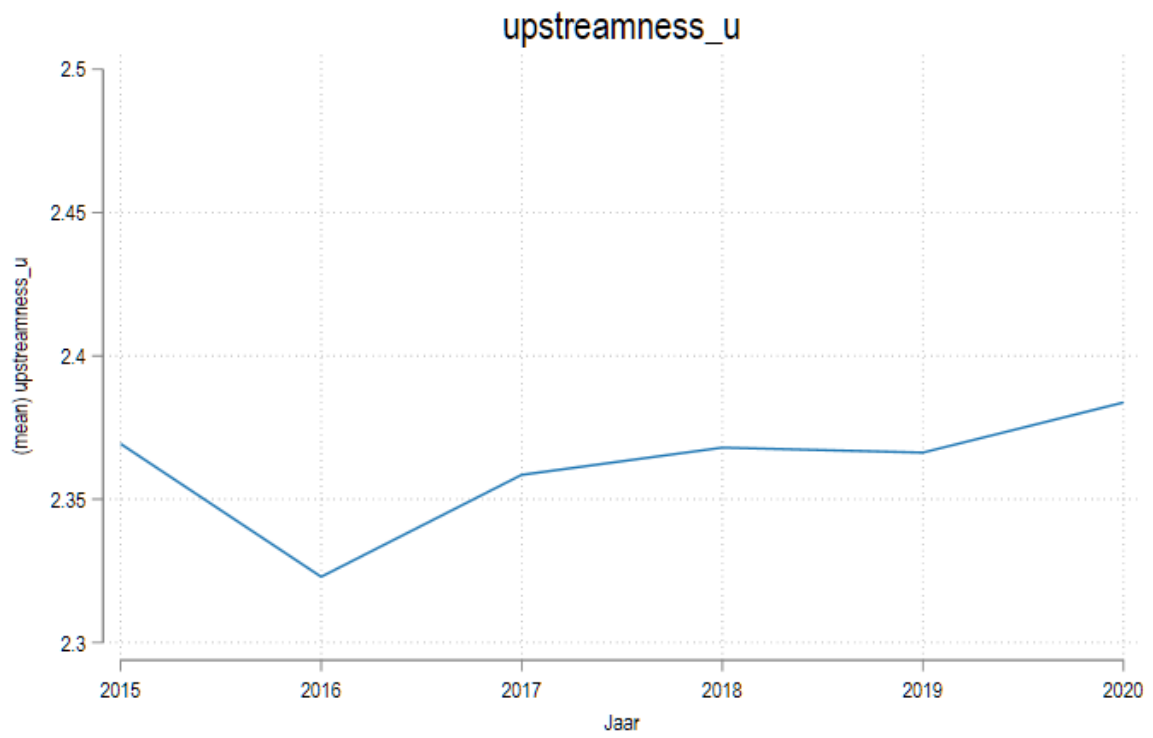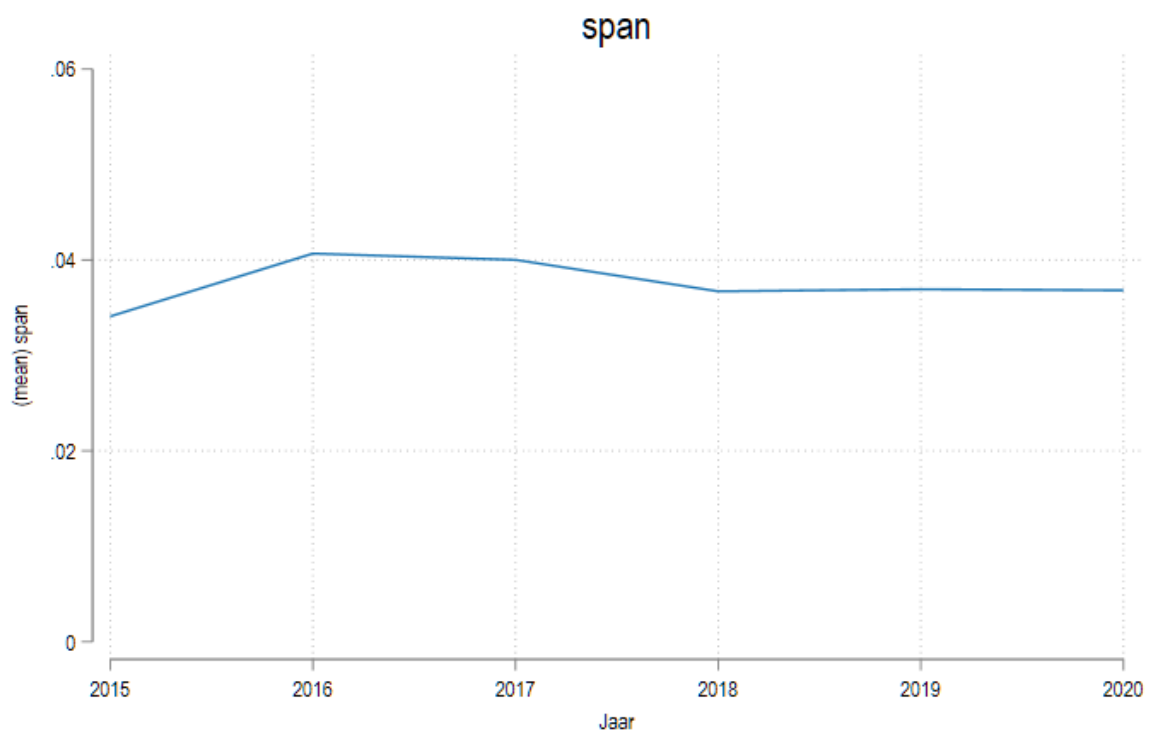**Figure 3: Export Upstreamness (U_X), 2015 – 2020**

Figure 4: GVC Span, 2015 - 2020

3. Drivers of GVC Position

What factors should be expected to determine a firm's choice of U_I, U_X, and its span? The related academic literature has produced several models and some empirical evidence supporting the idea that more productive firms choose to have larger GVC spans (Alfaro et al., 2019; Boehm & Oberfield, 2020; Chor et al., 2021; Fally & Hillberry, 2018). Chor et al. (2021) present a fairly general model of how a firm determines its GVC position and span. The model describes the general conditions under which a positive relation between productivity and span emerges. Firms in the model find it optimal to increase their total sales as a function of their productivity. The authors show that if (i) the firm's production function does not exhibit strongly decreasing returns to scale, and if (ii) the firm can, loosely speaking, perform a given extra step of transformation relatively efficiently in-house when compared to what the market offers, then rising productivity at the firm-level leads to a rising GVC span. Intuitively, firms want to increase their sales as they become more productive, and do so partially by increasing their operational scope. Furthermore, the authors show that the marginal incentives that a firm faces can differ when considering an expansion of span via an increase of import upstreamness U_I, or via a decrease of export upstreamness U_X. In other words, depending on local market and production function conditions, firms may find it optimal to achieve an adjustment to its GVC span either by increasing its adapting its import upstreamness, or by adapting its export upstreamness. Chor et al. (2021) show empirically that Chinese firms tend to increase their GVC span via an increase of import upstreamness, rather than a decrease of export upstreamness.

3.1 Empirical Approach

In this section we investigate the drivers of GVC position and span in Dutch firms. Equation 1 shows the baseline regression specification.

$$(1) \qquad G_{i,t} = \beta \cdot X_{i,t} + \mu_{s,t} + \xi_i + \varepsilon_{i,t}$$

$G_{i,t}$ stands for GVC Position, and $G_{i,t} \in \{U_I, U_X, Span\}$, $X_{i,t}$ is a set of (potentially) time-varying firm-level explanatory variables, and $\mu_{s,t}$ and ξ_i are two-digit-industry-by-year and firm fixed effects, respectively. β are the coefficients of interest.

We focus on productivity as the main explanatory variable, in order to estimate the within-firm effect of changes in productivity on GVC position and span. As noted above, we use three different measures of firm-year level productivity: labour productivity, and TFP measured according to the ACF, and the growth accounting method. We further include the log of the capital-to-FTE ratio, to control for capital-intensity. Finally, we include the log of a firm's age (+1) as a proxy of the firm's experience, and the log of total revenue as a proxy of firm size. All independent variables are lagged by one year.

3.2 Results

Table 1 shows the baseline results, where GVC position and span are regressed on three different measures of productivity. The results paint a broadly consistent picture across the specifications. As firms become more productive, they increase their GVC span (columns 3, 6, and 9). A 100% increase in productivity (according to the ACF measure) is associated on average with a 0.008 step increase in span. The results indicate that an increase in GVC span is achieved by both increasing the import upstreamness, and by decreasing the export downstreamness (although the point estimates here are not statistically significant).

The addition of capital intensity as a control variable in Table 2 decreases the point estimates of the coefficients on productivity marginally, thereby decreasing their statistical significance.[4] A rise in capital intensity within a given firm is associated with a smaller GVC span. This result can be interpreted as larger GVC spans potentially being correlated with larger workforces, therefore a lower capital intensity.

Table 3 further adds log of firm age and the log of total firm sales as further control variables. We find that firms expand their GVC span as they become larger or older. Interestingly, the estimation results suggest that firms increase their import upstreamness as they become larger, whereas they tend to decrease their export upstreamness as they grow older.

The results presented in Tables 1 – 3 are broadly consistent with those reported by Chor et al. (2021) for Chinese firms. Similar to those authors, we find that firms expand their GVC span as they become more productive, older, and larger. However, in contrast to their results, we find a more even split between adjustments in import and export upstreamness. Whereas Chor et al. (2021) report that Chinese firms mostly adjust their import upstreamness in order to expand their GVC spans, we find that Dutch firms adjust both their import and export upstreamness measures as they become more productive. This indicates that Chinese firms, in contrast to Dutch firms, may find it relatively difficult to take on tasks that are relatively downstream from them. It should be noted though that the sample period in Chor et al. is the early 2000's, just after the accession of China to the WTO and many Chinese firms entering the world market for the first time, whereas we study a sample in 2015 – 2020.

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[4] The addition of skill intensity, measured by the firm's total wage bill divided by the number of FTE, is currently work-in-progress and will be added to the paper in the following draft.

Table 1: OLS Regression of GVC Position and Span on Productivity

Dep. variable →	U_I	U_X	Span	U_I	U_X	Span	U_I	U_X	Span
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$Prod_{acf}$	0.0047*	-0.0034	0.0081**						
	(0.0029)	(0.0027)	(0.0039)						
$Prod_{ga}$				0.0042*	-0.0035	0.0077**			
				(0.0025)	(0.0023)	(0.0034)			
$Prod_{lab}$							0.0029	-0.0024	0.0053
							(0.0029)	(0.0027)	(0.0039)
Obs.	69,899	69,899	69,899	69,899	69,899	69,899	70,827	70,827	70,827
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SBI×Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All independent variables are lagged by one year. U_I, U_X, and Span are Import Upstreamness, Export Upstreamness, and GVC Span, respectively, measured at the firm-year level, as defined by Chor et al. (2021), and provided by Statistics Netherlands. $Prod_{acf}$, $Prod_{ga}$, and $Prod_{lab}$ are productivity as defined by the ACF, growth accounting, and labour productivity methods, respectively. SBIxYear FEs are two-digit industry-by-year fixed effects.

Table 2: OLS Regressions of GVC Position and Span on Productivity and Capital-Intensity

Dep. variable →	U_I	U_X	Span	U_I	U_X	Span	U_I	U_X	Span
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
K/L	-0.000189	0.00427**	-0.00446*	0.000327	0.00405**	-0.00372	-0.000588	0.00454***	-0.00512**
	(0.00167)	(0.00174)	(0.00235)	(0.00174)	(0.00180)	(0.00243)	(0.00166)	(0.00173)	(0.00233)
$Prod_{acf}$	0.00471	-0.00278	0.00749*						
	(0.00287)	(0.00274)	(0.00397)						
$Prod_{ga}$				0.00433*	-0.00211	0.00644*			
				(0.00260)	(0.00241)	(0.00350)			
$Prod_{lab}$							0.00367	-0.00298	0.00665*
							(0.00289)	(0.00276)	(0.00399)
Obs.	69,899	69,899	69,899	69,899	69,899	69,899	69,899	69,899	69,899
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SBI×Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All independent variables are lagged by one year. U_I, U_X, and Span are Import Upstreamness, Export Upstreamness, and GVC Span, respectively, measured at the firm-year level, as defined by Chor et al. (2021), and provided by Statistics Netherlands. $Prod_{acf}$, $Prod_{ga}$, and $Prod_{lab}$ are productivity as defined by the ACF, growth accounting, and labour productivity methods, respectively. SBIxYear FEs are two-digit industry-by-year fixed effects. K/L is the log of the capital to FTE ratio.

Table 3: OLS Reg. of GVC Position & Span on Productivity, Capital-Intensity, Size, and Age

Dep. variable →	U_I	U_X	Span	U_I	U_X	Span	U_I	U_X	Span
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
K/L	-0.000169	0.00430**	-0.00447*	7.33e-05	0.00403**	-0.00395	-0.000285	0.00455**	-0.00484**
	(0.00169)	(0.00178)	(0.00239)	(0.00177)	(0.00185)	(0.00249)	(0.00168)	(0.00177)	(0.00237)
Sales	0.00765**	-0.00284	0.0105**	0.00758**	-0.00301	0.0106**	0.00824**	-0.00275	0.0110**
	(0.00323)	(0.00392)	(0.00497)	(0.00315)	(0.00379)	(0.00482)	(0.00324)	(0.00392)	(0.00498)
Age	0.00701	-0.0166*	0.0236*	0.00711	-0.0166*	0.0237*	0.00661	-0.0167*	0.0233*
	(0.00874)	(0.00862)	(0.0121)	(0.00873)	(0.00861)	(0.0121)	(0.00875)	(0.00863)	(0.0122)
$Prod_{acf}$	0.00165	-0.00267	0.00432						
	(0.00324)	(0.00316)	(0.00454)						
$Prod_{ga}$				0.00185	-0.00235	0.00420			
				(0.00286)	(0.00269)	(0.00388)			
$Prod_{lab}$							0.000335	-0.00288	0.00322
							(0.00327)	(0.00318)	(0.00457)
Obs.	68,262	68,262	68,262	68,262	68,262	68,262	68,262	68,262	68,262
Firm FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
SBI×Year FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Robust standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01. All independent variables are lagged by one year. U_I, U_X, and Span are Import Upstreamness, Export Upstreamness, and GVC Span, respectively, measured at the firm-year level, as defined by Chor et al. (2021), and provided by Statistics Netherlands. $Prod_{acf}$, $Prod_{ga}$, and $Prod_{lab}$ are productivity as defined by the ACF, growth accounting, and labour productivity methods, respectively. SBIxYear FEs are two-digit industry-by-year fixed effects. K/L is the log of the capital to FTE ratio. Sales is the log of real sales of the firm. Age is the log of 1 + the age of the firm.

4. Outcomes of GVC Position and Span (work in progress)

This section will investigate firm-level variables that we regard as outcomes of, and jointly determined with a firm's GVC position and span. This will include variables such as profits, use of intermediate inputs, and balance sheet structure.

5. Conclusion

This study has explored the firm-level determinants of GVC positioning and span using a dataset of Dutch firms from 2015 to 2020. By applying the metrics of import upstreamness, export upstreamness, and GVC span similar to those proposed by Chor et al. (2021), our findings confirm that higher productivity, larger firm size, and greater experience are positively correlated with a larger GVC span. This pattern is consistent with findings in the literature on Chinese firms, suggesting that more productive firms tend to internalize more stages of production, thereby increasing their operational scope within GVCs.

We find suggestive evidence that firms becoming more productive not only increase their import upstreamness but also decrease their export upstreamness. Furthermore, our analysis highlights that as firms grow larger or older, they tend to adjust their positions by increasing import upstreamness and decreasing export upstreamness, respectively. These findings indicate that while there are similarities with the patterns observed in other economies, unique regional factors may play a role in shaping GVC participation.

In ongoing work, we are extending this research to examine how a firm's GVC position and span influence various outcome variables such as profitability, use of intermediate inputs, and balance sheet structure. This future analysis aims to deepen the understanding of the broader implications of GVC involvement on firm performance and economic resilience.

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