Working paper

Export transitions, productivity, and the supply chain

Assessing the influence of EAC trade costs reductions in exports and export supply chains

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Policy Paper

Export Transitions, Productivity and the Supply-Chain:
Assessing the influence of EAC trade costs reductions in exports and export supply-chains

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March 17, 2017

1   Introduction

In response to a widening trade deficit, the Ugandan government as part of the draft National Export Development Strategy has targeting export-oriented growth as its approach to "ensuring macroeconomic stability and economic and social transformation" (Ministry of Trade, Industry and Cooperatives, 2017). Similarly, the new 'Build Uganda, Buy Uganda' policy aims to develop domestic trade through targeting the entire supply-chain by linking MSMEs to larger established firms (Ministry of Trade, Industry and Cooperatives, 2014).

This paper presents empirical evidence in support of these dual goals. Indeed, the Ugandan Government has already had some success in achieving these aims. The Government of Uganda through its participation in the East African Community (EAC) and the Northern Corridor Transit and Transport Coordination Authority has substantially reduced trade barriers through a significant reduction in transport costs. This has made it substantially easier for firms to export goods and to export different types of goods.

No research project has yet been able to assess the consequences of this policy intervention in terms of the impact on firm exports, productivity and most interestingly the wider supply chain.

In the first section of this paper, I look at the impact of the reduction in transportation costs on Ugandan export performance. I find a strong association between the the reduction in transportation costs and the recent growth in export volumes, the number of exporters and the diversification of export products in Uganda.

I then look at what makes exporters special in terms of their productivity, and their connection to domestic firms. Consistent with other research, I find that exporters have

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higher productivity, are larger and employ more people than non-exporting firms. I also find that exporters are more interconnected than non-exporters and have higher productivity suppliers than non-exporters.

In the next section, I pull together these effects to consider the direct and indirect causal impact of firms exporting. In terms of the direct effect, I find that exporting leads to causal 13% increase in output and a 12% in increase in output per worker for the exporting firm. In terms of the indirect effect, I show that a exporting leads to a growth in domestic input usage by 8% and an increase in foreign imports of 9%. Overall, the ratio of imports to exports does not significantly increase. I then show that exporting has a direct productivity spillover to export suppliers by increasing supplier productivity by 22%. Collectively these results show a very substantial positive impact from exporting on the Ugandan economy. My research suggests this growth would not have happened without these firms becoming exporters.

In the final part of this paper, I consider ways in which the Government can further encourage linkages between exporters and domestic suppliers as part of the implementation of the 'Buy Uganda, Build Uganda' policy. I argue the Government should consider the following three options:

- Establish a Local Content Unit (LCU) which can help encourage linkages between exporters, foreign firms and domestic suppliers.

- Consider establishing a modern publicly available company database which provides up-to-date and detailed information on suppliers of goods in Uganda. To make this credible to businesses this should be linked to URA domestic tax data.

- Consider the current reliance on a few key export suppliers. Review the current state of these support sectors and whether the government can step in to encourage more competition.

The remainder of this paper is organised as follows: Section 2 discusses the data used in this project; Section 3 discusses the role of EAC integration, trade costs and recent trade performance; Section 4 presents descriptive statistics on exports, exporters and the supply-chain in Uganda; Section 5 presents a regression approach to the causal question of the impact of exporting on firm performance and supply-chain decisions; Section 6 discusses policy implications from this research and ways in which this can be implemented as part of the BUBU policy; Section 6 concludes.

2   A note on the Data

The data used in this paper comes from five linked datasets collected by the Ugandan Revenue Authority (URA), which are administered for taxation purposes and contains

details on firm domestic and international trade. This data is confidential and is made available for the purposes of this research. All datasets have been anonymised by the URA, and all results are presented at the aggregate level so that no firm can be identified.

The datasets contain the universe of firms paying tax in Uganda; consequently they are representative of the entire formal sector. It also contains the universe of direct-exporting firms[1], as all firms choosing to export must go through a customs office at the border, and must be registered to pay tax. This is probably the most interesting sample of firms to consider in Uganda as they are the largest, most technically adept, and employ the most people. Inference on the informal sector is outside the scope of this study.

All datasets, cleaning strategy and basic descriptive statistics are discussed in more detail in the accompanying academic paper to this policy report.

3 EAC integration, trade costs and recent trade performance

In this section we discuss the recent change in trade costs through the facilitation of EAC and the accompanying trend in key export performance indicators.

As a landlocked country in central Africa, Uganda has some of the most expensive transportation costs in the world. In 2017, Uganda ranked 136 out of 190 countries on World Bank's Trading Across Border Index (World Bank, 2016). One of the main pillars of the East African Community is to facilitate trade through lowering trade costs. This has been achieved through the signing on the EAC customs union in 2005 which included four pillars: (1) the establishment of a Common External Tariff (CET); (2) the establishment of EAC Rules of Origin (RoO) criteria, including Certificates of Origin and Simplified Certificates of Origin; (3) the internal elimination of tariffs for goods meeting the EAC RoO criteria and (4) the elimination of Non Tariff Barriers (NTBs) (Makame, 2012).

In tandem with the formation of the customs union, many additional local and regional institutions have been established to target and reduce trade costs. The EAC has several high ranking and institutional bodies which target the removal of Non-Tariff Barriers including National Monitoring Committees, the EAC Regional Forum on NTBs, and the National Implementation Committees on Common Market. Together they publish a quarterly report monitoring the removal of NTBs (East African Community, 2015). The Northern Corridor Transit and Transport Coordination Authority (NCTTCA) has a mandate to "remove all obstacles to the flow of trade and services along the Northern Corridor". It also plays a vital role in tracking transport traffic, times and costs in the EAC (NCTTCA, 2017).

In addition to government efforts, donors have also sought to address these issues. One of the biggest efforts has been the establishment of TradeMark East Africa in 2010 to "support the growth of trade - both regional and international - in East Africa" (TradeMark EA, 2017).

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[1] the alternative to direct exporting would be exporting through an intermediary. The dataset also allows me to observe this, but for brevity reasons, I do not consider it at this time.

Collectively these institutions have made several impressive achievements in reducing barriers to export. These include:

- one-stop border posts

- removal of role-in-motion weigh bridges

- removal of police check points

- port upgrading

- improved road surfaces

- EAC Single Customs Territory including a regional bond and interfacing of regional customs systems.

Member states have committed to a matrix of reforms[2], which have been extensively monitored and implemented. Importantly, these reforms are likely to be permanent given the oversight of the regional body, allowing businesses to make long-term export decisions.

Given the large political focus it is important to consider the degree to which these efforts have brought down trade costs. Figure (1) shows the average cost and time to export goods from Uganda through the Northern Corridor to the port of Mombasa in Kenya. Both the costs and time to export goods has seen a rapid decline since 2009. In 2009 USD terms, the cost to export has almost halved from USD 5,629 in 2009 to USD3,000 in 2014. At the same time the time to export has fallen from 32 days in 2009 to 25 days in 2014.

It is important to consider the consequences of this rapid decline in trade costs on key export performance. Figure (2a) shows the export volume from Uganda mapped against the change in time to export. There is very clearly a strong negative correlation between the two data series. While not necessarily causal, it is consistent with a story of trade cost reductions spurring export growth.

In Figure (2b), we show that over the same period of trade cost reduction there has also been growth in the number of unique exporters from Uganda. This is consistent with trade cost reductions pushing some new exporters into exporting who would not have exported otherwise.

In Figure (2c), we look at the number of unique products exported from Uganda.[3]. Again the pattern is very similar to the above examples. As trade costs have fallen, there has been a corresponding rise in the number of unique products exported by firms in Uganda.

Collectively, this points to a success story for policy in the EAC. The preliminary evidence is consistent with trade cost reductions spurring export performance growth. In the

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[2]For an example of one of these reports visit http://www.eac.int/news/index.php?option=com_docman&task=doc_view&gid=407&Itemid=73

[3]A unique product is described by being in a different HS-4 category where a typical HS-4 category is for example "Potatoes; fresh or chilled"

Figure 1: Cost and time of exporting in Uganda has fallen

Source: Authors calculated based on a weighted average of data from the Northern Corridor Transport Observatory and the World Bank Trading Across Borders Index.

next section we begin to demonstrate why growth in exports and exporters is so vital for the Ugandan economy.

Figure 2: Transport Cost and economic indicators
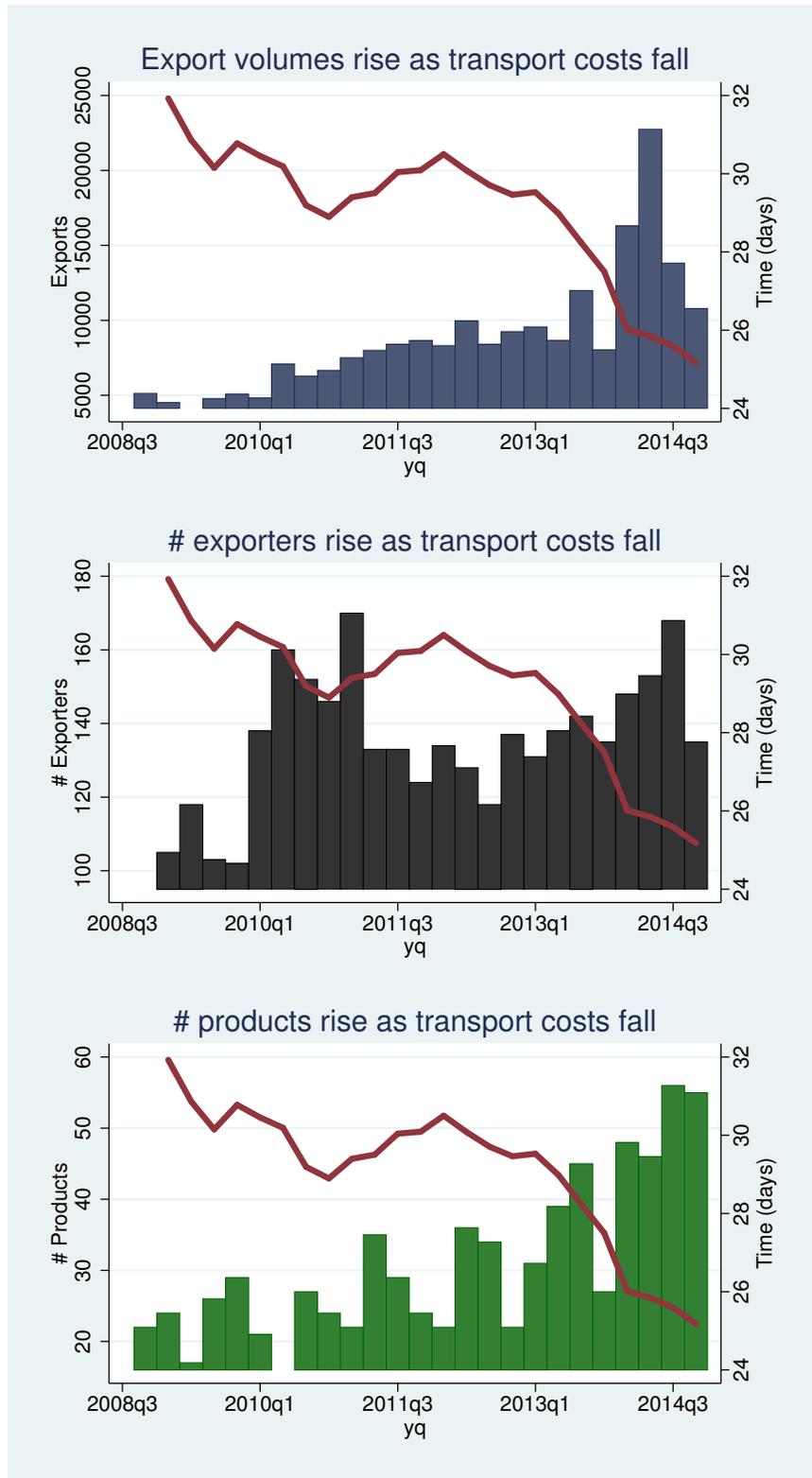
Panel (a) shows export volumes in 2011 USH against the time to export on the northern corridor. Panel (b) shows the number of exporters against the time to export on the northern corridor. Panel (c) shows the number of products classified at the HS-4 digit level against the time to export on the northern corridor. Time to export is a weighted average of data from the Northern Corridor Transport Observatory and the World Bank Trading Across Borders index.

4 Exports, Exporters and the Supply-Chain in Uganda

In this next section, I now present descriptive statistics on exporters in Uganda and their connections with the domestic sector. This sections demonstrates that connection to the external sector is vital for the performance of the Ugandan economy.

In this section I will attempt to show three things:

1. Bigger and higher productivity firms will have suppliers of higher quality, have more supplier, have higher profits, and export

2. Exporters are more interconnected with the rest of the economy than non-exporters suggesting exporter performance can be important to the performance of the rest of the economy

3. Some suppliers to exporters have substantial market power. This could influence the degree to which exporting could be limited by domestic supply chains

Table 1 provides strong empirical support for Proposition 1 that exporters have higher productivity[4], suppliers of higher quality (including more importers), more suppliers, and higher profits than non-exporters. Also note from Table 1 that exporters in Uganda have on average more employees and have a larger wage bill than their non-exporting counterparts.[5]

Indeed, exporter exceptionalism is a well-known result within the trade literature (Bernard and Jensen, 1999; De Loecker, 2007; Kugler and Verhoogen, 2012), although this is the first paper to show that this extends directly to the productivity of the supplier. Table 1 suggests that the firms in my dataset are consistent with datasets used in previous research. It also suggests that firms who become first-time exporters are likely to be different from their non-exporting counterparts, as discussed in my empirical strategy.

Turning in more detail to the supply-chain, in Figure 3 I present a graphical representation of the Ugandan formal sector between 2009-2015. Each node represents a firm and each connection indicates an input trade has taken place between two firms. This partitions the Ugandan economy into 83,000 firms and a total of 420,000 firm-to-firm connections. The spatial location of nodes is driven by a force directed layout known as ForceAtlas2. This layout works like a physical system: nodes repulse each other like charged particles, while edges attract their nodes, like springs. These forces create a movement that converges to a balanced state (Jacomy et al., 2014).

Nodes are scaled by the number of firms connected to the firm, helping to identify firms which are hubs. Finally, nodes are coloured red if they export at least once over the period. In total there are 3026 exporting firms, which can be linked between the network and domestic trade datasets.

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[4]Productivity measures are discussed in detail in the empirical strategy.

[5]When we state that exporters have higher productivity and higher wages this is of course not conditional on sales compared to non-exporters in the same sector as that would contradict the statement that exporters have higher productivity.

Table 1: Descriptive statistics for selected variables

	Beta Coefficient
Ln annual total output	1.905***
	(0.0373)
TFP (Levinsohn-Petrin)	0.440***
	(0.0220)
Ln output per worker	1.009***
	(0.0320)
Ln annual total intermediary inputs	1.916***
	(0.0289)
Ln annual total imports	2.000***
	(0.0400)
Ln number of suppliers	1.609***
	(0.00920)
Ln annual total pay	1.368***
	(0.0191)
Ln annual total employees	0.975***
	(0.0155)
Supplier TFP (Levinsohn-Petrin)	0.0673***
	(0.00904)
Supplier Ln output per worker	0.117***
	(0.0171)

Standard errors in parentheses

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Regression coefficients from $X_i = \alpha + \beta Export + c * Industry$.

From Figure 3, there are three main takeaways that relate to proposition 2 and 3. First, one can see that the full network displays a clear pattern of a core of interconnected firms and a periphery of isolated suppliers. Among the core, there are some very large hub firms which purchase from and supply a high proportion of the network. There are also a large number of critical firms who serve as the only purchaser for many of the smaller producers. Second, it is possible to see that exporting firms have a range of degree centrality, which suggests that firm size is likely to be an important factor in considering heterogeneous effects from exporting. Third, it is clear that some firms are more captive than others in that they sell to just one buyer. This suggests that conditions within the suppliers' market may also be a key variables for considering heterogeneous effects.
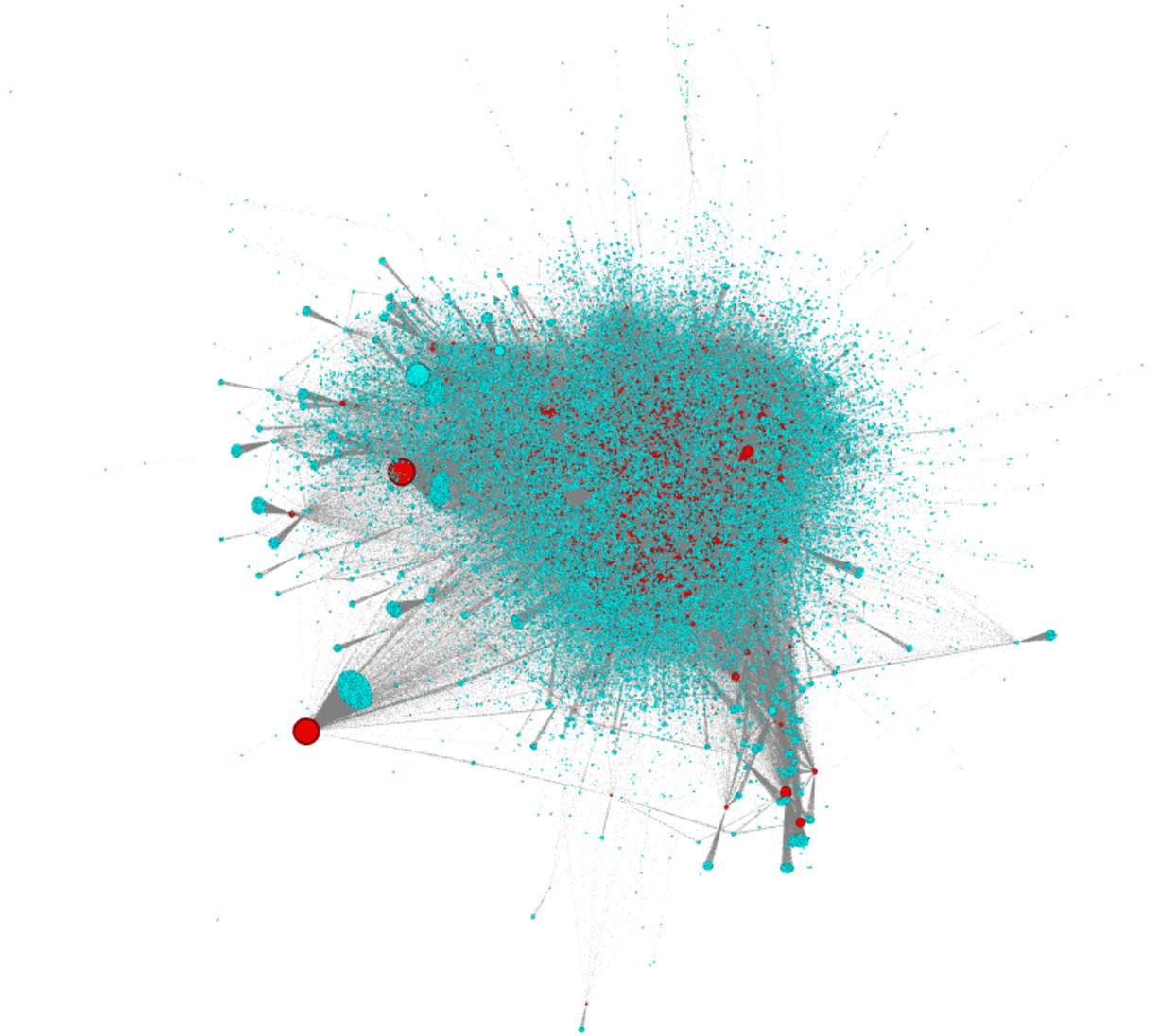
Figure 3: Graphical representation of Ugandan firm-to-firm connections (core) for the years 2009-2016. Each node corresponds to a firm and each edge represents an input-supply relationship between two firms. Nodes coloured red show exporters. Larger nodes show the firm has more connections, this helps to identify 'hub' firms. The layout of nodes is determined by ForceAtlas2 network layout algorithm. ForceAtlas2 is a force directed layout: it simulates a physical system in order to spatialize a network. Nodes repulse each other like charged particles, while edges attract their nodes, like springs. These forces create a movement that converges to a balanced state (Jacomy et al., 2014).
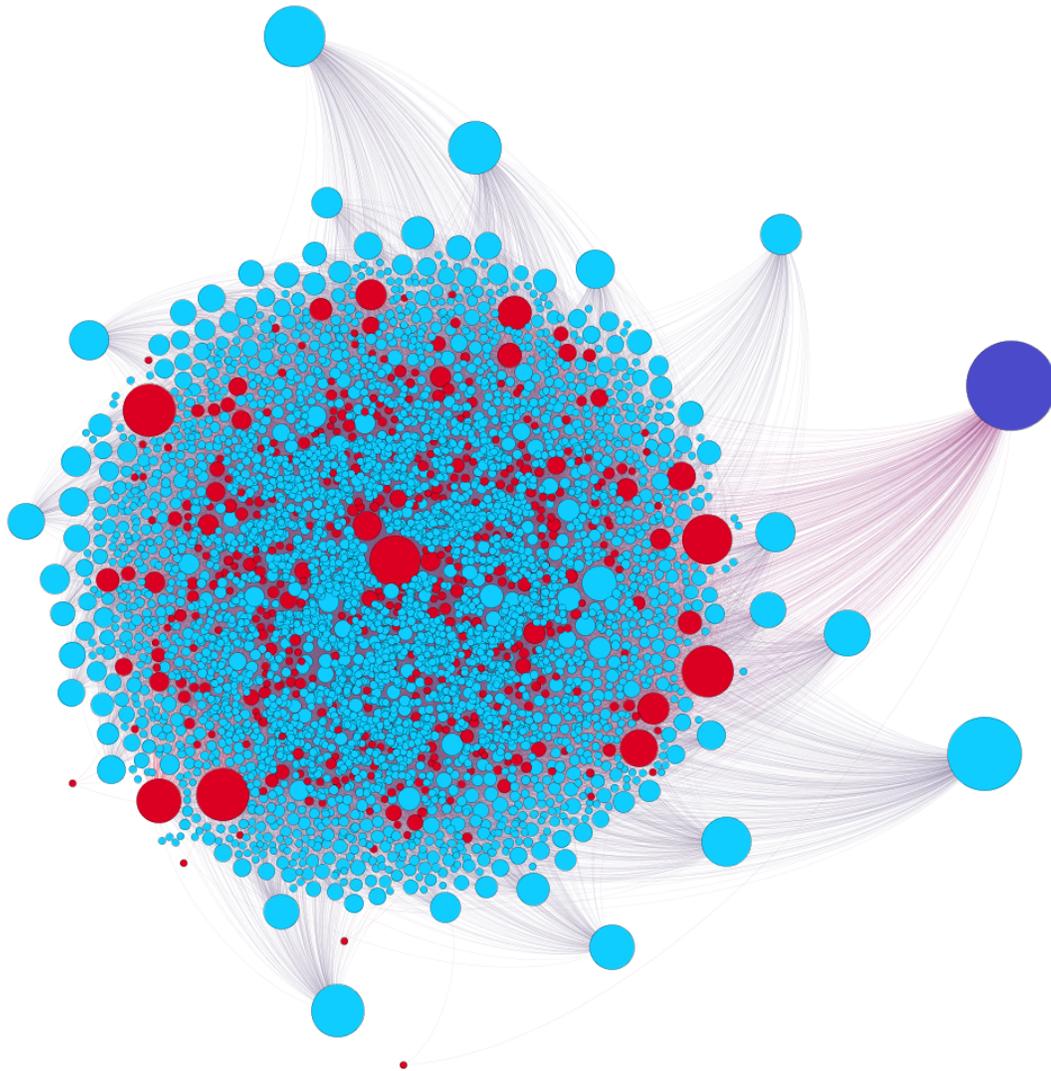
Figure 4: Graphical representation of Ugandan manufacturing exporters (red), and their suppliers (blue), and Imports (purple). Each node corresponds to a firm and each edge represents an input-supply relationship between an exporter and a supplier. Larger nodes show the firm has more outward connections, this helps to identify 'hub' supplier firms. The layout of nodes is determined by ForceAtlas2 network layout algorithm. ForceAtlas2 is a force directed layout: it simulates a physical system in order to spatialize a network. Nodes repulse each other like charged particles, while edges attract their nodes, like springs. These forces create a movement that converges to a balanced state (Jacomy et al., 2014). I then use an option to dissuade hubs in order to highlight the largest firms.

Figure 4 focuses just on exporting manufacturing firms highlighted in red and their suppliers highlighted in blue. I have scaled each node by their 'out-degree' which is the number of firms for which they are a supplier. The purpose of this figure is to highlight

Table 2: Top 15 interconnected export suppliers

n	Supplier business activity	# firms supplied
1	Cargo handling	1409
2	Warehousing and storage	1251
3	Manufacture of batteries and accumulators	765
4	Sale of motor vehicle parts and accessories	690
5	Wired telecommunications activities	635
6	Manufacture of other fabricated metal products n.	625
7	Wired telecommunications activities	606
8	Warehousing and storage	594
9	Retail sale of hardware, paints and glass in spec	555
10	Publishing of newspapers, journals and periodical	546
11	Manufacture of basic iron and steel	542
12	Construction of utility projects	522
13	Manufacture of plastics products	501
14	Cargo handling	501
15	Manufacture of plastics products	492

that there are a handful of firms that act as a supplier to almost all exporters. These can be seen as the large blue dots on the periphery of the graph. This could be an indication of an under-supply of vital export services to exporters meaning that there are just a few providers. This might be a concern if we believe that these suppliers have some market power over exporters and extract rent. Table 2 shows the industry of the top 15 most interconnected suppliers. What we observe is a mixture of transport and storage services, communication services and manufacturing. This suggests a policy focus on inputs in these areas could have substantial dividends on export performance.

The final thing to observe from Figure 4 is the importance of imports to the manufacturing sector. This can be seen in the graph by the scale of the large purple dot. Indeed, over 90 percent of Ugandan manufacturing firms are direct importers. My main takeaway from this is that if you want to have a manufacturing sector in Uganda you need access to high quality imported inputs.

In Table 3 I show the top 15 most imported items by manufacturers in Uganda. As reported in the National Export Development Strategy, some of these items could be produced in Uganda such as palm oil and sugar. Others however probably cannot such as gasoline oil and cement clicker. Indeed, without these important inputs many manufacturing inputs in Uganda would not be able to function efficiently.

Table 3: Top 15 imports from manufacturers

n	hscode	hsdesc	Export Value (USH)
1	15111000000	Crude palm oil	4.026e+11
2	10019990000	Cereals; wheat and meslin, other than wheat	3.758e+11
3	72083900000	Flat/hot-rolled iron/steel	2.301e+11
4	27101220000	Motor Spirit (gasoline) premium	2.113e+11
5	25231000000	Cement clinkers whether or not coloured	1.244e+11
6	15119010000	Palm Oil in whether or not refined	1.116e+11
7	25232900000	Portland cement whether or not coloured	1.069e+11
8	33021000000	Mixtures of odoriferous substances	1.058e+11
9	39012000000	Polyethylene >	1.043e+11
10	72139100000	Hot rolled iron/steel bars & rods,in coil	1.027e+11
11	17019910000	Sugar for industrial use	8.427e+10
12	27101931000	Gas Oil (automative, light, amber)	7.915e+10
13	39021000000	Polypropylene, in primary forms	7.468e+10
14	39205990000	Other plates of acrylic polymers	6.313e+10
15	72104900000	Flatrolled iron/steel	6.125e+10

5 Causal Impact of Exporting

5.1 Empirical Strategy

In this section I combine all of the work done in the four previous sections and answer the important question of how much does exporting benefit Ugandan firms and whether this has been facilitated by the lowering of trade costs facilitated by EAC governments.

For the purposes of brevity I will not explain the full empirical strategy adopted to undertake this process. For extensive details see the accompanying academic paper. In this section I will show the following three effects:

1. Exporting is causally linked with a significant increase in the exporting firm's productivity

2. Exporting effects the exporters' supply chain in three main ways:

   (a) Exporting leads to spillovers in productivity to domestic suppliers

   (b) New exporters increase domestic input and foreign import usage

   (c) New exporters replace unproductive suppliers with more productive domestic suppliers

3. Exporter size and conditions within the suppliers' domestic market are predictive of which of these effects takes place.

The baseline specification aims to document the impact of exporting on a vector of outcome variables. Following Bernard and Jensen (1999) among others, I run the following two regressions using OLS:

$$Y_{it} = \beta_0 + \beta_1 Export_{it} + \delta T + a_i + u_{it} \qquad (1)$$

$$Y_{it} = \beta_0 + \beta_1 Export_{it} + \beta_2 Export_{it} * big_i + \delta T + a_i + u_{it} \qquad (2)$$

where subscripts i and t indicate firm and time, respectively, *Export* is a dummy variable for whether firm i is an exporter in time t, *big* indicates the firm has more than 50 employees in 2009, T is a vector of time dummies, and a_i is an unobserved time-invariant firm fixed effect. The fixed effects are included to consider within-firm variation, and to remove variation across firms of different kinds. Y is a vector of the exporting firm's outcome variables, which are discussed below.

Proposition 1 stated that exporting is associated with increased output and higher productivity for the exporting firm. To test this empirically, I consider $Y_{it} = \{Exporter\ Output_{it}$, $Exporter\ Productivity_{it}\}$.[6] If there is a positive effect from exporting, one would expect the β_1 coefficient to be positive.

Proposition 2.1 stated that exporting leads to spillovers in productivity to domestic suppliers. This is examined by letting $Y_{it} = \{Supplier\ Productivity_{it}\}$ to look for productivity spillovers.

Proposition 2.2 stated that new exporters increase domestic and foreign input use and change the composition of their domestic supply-chain. This is examined by letting $Y_{it} = \{Domestic\ Inputs_{it}, Imported\ Inputs_{it}, add_{it}, drop_{it}, add\ and\ drop_{it}\}$. *Domestic Inputs*$_{it}$ is the log of domestic input volumes, *Imported Inputs*$_{it}$ is the log of imported inputs and *add and drop*$_i$ is a dummy variable for whether a firm added and dropped any suppliers in a given year.

Proposition 2.3 stated that new exporters replace unproductive suppliers with more productive domestic suppliers. I look to see whether firms pick more productive suppliers on average by looking at measures of productivity for each supplier against a set of dummy variables for whether the firm first became a supplier prior to exporting, during the export year, or, a year or more after the export year.

$$Average\ New\ Supplier\ Productivity_i = \beta_0 + \beta_1 exportyear_i + \beta_2 exportyear_i * big_i + big_i + u_i \qquad (3)$$

While panel-data methods control for time-invariant firm fixed effects, selection into exporting is endogenous and largely driven by time-varying unobservables - more able firms decide to export, less able firms do not. I address this by using an instrumental variables approach and instrumenting for the export decision with the inter-temporal change in trade costs interacted with firm specific variables.[7]

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[6]Productivity is discussed in detail in the academic paper. I use three measures (i) Output per worker, (ii) Total Factor Productivity (TFP), and Levinsohn-Petrin Productivity (Levinsohn and Petrin, 2003).

[7]The full details behind this approach are omitted for the purposes of this policy report. For more details see the accompanying academic paper.

5.2 Results

In this section I shows results from the set of panel-data and IV regressions. First, I consider the impact of exporting on firm growth and productivity, I then consider exporting and firm supply-chain decisions, finally I look at some additional results on firm searching behaviour.

5.2.1 Exporting and exporting firm growth and productivity

Table 5 presents results from the baseline specification considering how exporter output and productivity variables change before and after exporting, when we control for firm and time fixed effects.

As can be seen from column 1 of Table 5, output increases after exporting and is significant at the one percent level. This is consistent with previous research that firms grow when they first export.

In column 4 and column 7 of Table 5, results show that exporting is also associated with an increase in productivity of exporting firms. This is also consistent with the wider literature which has found exporting increases exporting firm productivity especially in developing countries (Pavcnik, 2002).

In column 2 of Table 5, I include an interaction term between the size of the exporting firm and the export dummy. Here we can see that it is the larger new exporters that increase output the most. However, size does not appear to have a significant impact on the amount of productivity growth from exporting as shown in column 6 and 9.

In columns 3, 6 and 9 of Table 5 I instrument for the decision to export. As can be seen in the first stage regressions in Table 9, the instrument is positive and significant. This is consistent with the intuition that goods with a lower product value per-shipment benefit more from a transport cost reduction.

The instrument performs quite well at predicting export entry. This can be seen through F-Statistics which are above 30[8] and high values in the Sanderson-Windmeijer Chi-squared and F-statistics tests for under-identification and weak identification, respectively. In general the size of the coefficients are smaller but still show the same effect of exporting causally leading to an increase in output and productivity.

5.2.2 Exporting and firm supply-chain decisions

Table 6 shows how exporting influences domestic and foreign input choices. Column 1 shows that exporting is associated with a positive and significant increase in domestic inputs. Column 2 shows that there is no significant difference between small and big firms in their increase in domestic inputs.

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[8]Except in the import specification in Table **??** where the F-statistic is 15 due to the lower number of observations and the addanddrop specification which has a slightly different sample but still significant F-statistics.

Column 4 and 5 consider firm foreign import choices. From column 5 we observe that only the biggest firms see an increase in imports after exporting for the first time.

In columns 3 and 6 we instrument for the decision to export. We again find the same relationship to those shown in the fixed effects regressions with coefficient sizes slightly lower.

Together these results show that bigger new exporters look for inputs abroad, whereas smaller new exports look domestically. This is elaborated on further in Table 8.

Table 8 presents results of the probability of adding and dropping a supplier in a given year. I find that smaller exporters are more likely to add and drop suppliers when exporting for the first time. This is consistent with the hypothesis that smaller exporters are searching domestically for better suppliers while larger exporters look abroad. Correspondingly, Table 4 shows that larger firms are also less likely to add more productive suppliers.

Finally within this section, Table 7 looks for spillovers in productivity from exporters to suppliers. Columns 1, 3 and 5 show the impact on the average productivity of original suppliers before and after the exporting firm exported for the first time. We observe a positive and significant increase in productivity for suppliers as a result of having a purchaser who becomes an exporter. The mechanism for this productivity spillover cannot be discerned from this regression. However, it is consistent with a hypothesis of knowledge transfer from the exporter to the supplier.

Columns 2, 4, and 6 suggest that average supplier productivity increases more when the exporter is large. This suggests only larger firms are able to overcome the fixed costs of improving suppliers.

5.2.3 Search and other additional results

In this final results section, I consider how changes in new supplier productivity is influenced by exporting and consider how conditions within the suppliers' domestic market may effect the scale of changes. These results are presented separately from those in Section 5.2.1 and 5.2.2 because they use different samples of the data which do not allow for the use of the IV.

Table 4 presents results from specification 3 where I look to see whether firms pick more productive suppliers on average by looking at measures of productivity for each supplier against a set of dummy variables for whether the firm first became a supplier prior to exporting, during the export year, or, a year or more after the export year. From Table 4, we can see that on average larger firms have suppliers with higher productivity but that it is the smaller firms which bring in new suppliers of higher quality during the export year. This suggests that these firms are the ones which stand to gain the most from upgrading their domestic supply-chain.

Table 4: Average Supplier Productivity added before and after export

	(1) Levinsohn-Petrin	(2) Output per worker	(3) TFP
Export year	0.106**	0.234***	0.0485**
	(2.44)	(6.68)	(1.97)
Export year * big	-0.0913	-0.0949	-0.0695*
	(-1.26)	(-1.42)	(-1.69)
big	0.163***	-0.0262	0.0605***
	(5.60)	(-0.82)	(3.66)
Constant	7.672***	16.17***	0.264***
	(173.80)	(413.12)	(10.54)
Year fixed effects	Yes	Yes	Yes
Observations	4653	8088	4653

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$

6 How to improve linkages between domestic and International firms

Having shown that exporting can drive growth in the Ugandan economy through connections to the supply-chain. This section considers ways in which the government can target greater linkages between exporters and the supply-chain.

I argue that as part of the Buy Uganda, Build Uganda policy the government can target the following three interventions to increase supplier-to-exporter linkages

6.1 Local Content Unit

The first policy suggestion to improve supplier linkages is to establish a Local Content Unit (LCU). My research suggests that local suppliers can directly learn from exporters and from foreign businesses and to grow and improve their productivity. Indeed, in most cases foreign businesses actively seek domestic suppliers, an example of this is given in Box 1.

To maximise the gains from exporting firms it is vital the Ugandan economy maximises the number of firms with linkages to large exporters and foreign firms. One way to do this is by establishing a LCU.

Professor John Sutton has written extensively on this area. He argues *"[w]hat is needed is a small, highly professional team that can liaise with Multinational Firms in a co-operative manner, and with a deep understanding of both (a) local capabilities, and (b) the feasible modes of engagement of local firms in supply-chains"* (Sutton, 2014). To achieve this he suggests the following four steps

- **Understanding Local Companies**. In order to provide useful advice, it is first vital that a LCU has detailed information on businesses in Uganda. The LCU should

visit a cross-section of firms in each industry and discuss their strengths, weaknesses and needs.

- **An Enterprise Development Centre (EDC)**. The role of an EDC is to provide training and capability building for Ugandan businesses to bring them up to scratch to obtain contracts from exporters and FDI.

- **Partners in the Process**. In order that an LCU is successful it is vital that the organisation is partnering with local businesses. In general, businesses in Uganda would prefer to source goods locally but are constrained by local availability of high quality inputs. Given the chance, they would happily partner with a Government scheme to promote linkages.

- **Shadowing Schemes**. Shadowing schemes allow local graduates to enter foreign businesses to shadow more senior members of staff. Shadowing graduates often then go on to set up successful sub-contractors which benefit the original company and the original institution.

(Sutton, 2014)

Box 1. Tullow Oil Local Content

Tullow Oil is an independent oil and gas exploration and production company working in Africa with operations in Ghana and Uganda. As part of Tullow Oil's business model they seek to maximise participation of local businesses within their supply-chain. In 2015 they spent USD 309m on local suppliers in areas such as medical equipment, civil and mechanical engineering services, transport services, security and freight forwarding.

In order to bridge the information gap between the company and local suppliers, Tullow has held contract awareness events, enterprise development centres, training development mentoring and coaching, and vocational training schemes. This is only really possible because of the size of Tullow oil's investment. What an LCU can offer is these types of training schemes for a much wider range of businesses.

6.2 Supplier Database

The second recommendation is to consider establishing a supplier database of all firms operating in Uganda. One complaint often made by foreign businesses is that they cannot find domestically produced goods available locally. However, often this is simply because the firms are not well known to these business people. One way to reduce this 'information constraint' is to establish a business registry of all of the firms operating in Uganda and to make this information publicly available and searchable by business people.

This has been tried in other countries and has sometimes failed due to the following reasons: (1) the database quickly goes out of date and the details of firms are not reliable; (2) the database is not easily searchable.

To avoid these problems I suggest the following solution. Link the URA domestic tax data to the firm registry. Using this detailed firm information, business people could get detailed information about firm transaction history, firm sales, and firm performance. This could then be used to verify firm reliability and allow foreign businesses to quickly identify high quality domestic suppliers.

In addition to encouraging domestic linkages, it is likely that banks could also use this system to verify the reliability of firms wishing to obtain credit. This would then increase firm access to finance.

The final benefit is that it may encourage more firms to formalise due to the benefits of being on this registry.

6.3   Export Supplier Sector Review

The final policy recommendation is to conduct a thorough review of export support sectors including cargo handling, transportation firms, warehousing and storage. My research suggests that there are a very small number of these firms which service a large number of exporters. If these sectors are improved we might see substantial improvements in exporter efficiency.

7   Conclusion

This paper aimed to undertake three main exercises. First, the paper looked to see whether there is evidence in support of the Government of Uganda's regional focus on transportation cost reductions. Second, the paper considered the role of supply-chains in the export process and whether exporters can drive performance along the supply-chain. Finally, this paper considered ways in which the Government of Uganda can support supply-chain development through the Buy Uganda, Build Uganda policy.

In answering the first question, I found strong support for the government's focus on reducing transportation costs in the impact on the exporting sector. I find that exports, the number of exporters and product diversification have grown at the same time as the reduction in transport time and cost.

In considering the second question, I find that exporting causally leads to firm output and productivity growth suggesting export-oriented growth strategy is an important policy for the Ugandan government. This is due to a direct effect on exporters and an indirect effect on export suppliers.

Finally, I considered how the Government of Uganda could increase linkages to the export supply-chain as part of the Buy Uganda, Build Uganda policy. I argue in favour of three

policy options. First, the establishment of a Local Content Unit to support supplier access to export anchor firms. Second, the implementation of a modern supplier database linked to URA tax data to ensure buyers have up-to-date trustworthy information on suppliers. Third, I argued that a study should be conducted on export support sectors to consider ways to introduce more competition to these sectors.

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Table 5: Exporter Growth IV

	(1) Output	(2) Output	(3) Output-IV	(4) Output/worker	(5) Output/worker	(6) Output/worker-IV	(7) LevPet	(8) LevPet	(9) LevPet-IV
export	0.404***	0.324***	0.134***	0.129*	0.129	0.156***	0.161**	0.155**	0.0322
	(5.15)	(3.61)	(2.91)	(1.65)	(1.44)	(2.92)	(2.53)	(2.15)	(0.26)
bigexport		0.321*	-0.0255		0.000213	-0.0377		0.0240	0.0869
		(1.83)	(-0.53)		(0.00)	(-0.68)		(0.17)	(0.65)
time and firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AP F-Test			48.21			48.21			46.14
SW F-Test			52.33			52.33			52.66
SW Chi-sq			157.1			157.1			158.1
N	16896	16896	15071	15073	15073	15071	13872	13872	12836

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Exporter Input IV

	(1) Domestic Inputs	(2) Domestic Inputs	(3) Domestic Inputs-IV	(4) Imports	(5) Imports	(6) Imports-IV
export	0.229***	0.181***	0.0770**	0.0956	-0.0186	-0.0276
	(3.74)	(2.60)	(2.19)	(0.95)	(-0.15)	(-0.50)
bigexport		0.202	-0.0800**		0.367*	0.115**
		(1.46)	(-2.07)		(1.77)	(2.45)
time and firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
AP F-Test			46.68			17.26
SW F-Test			53.35			20.04
SW Chi-sq			160.2			60.27
N	14778	14778	12861	5485	5485	4999

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Supplier Productivity Spillovers IV

	(1) Output/worker	(2) Output/worker	(3) Output/worker-IV	(4) LevPet	(5) LevPet	(6) LevPet-IV
export	0.117*	0.0520	0.219***	0.163***	0.0890	0.191**
	(1.83)	(0.55)	(3.19)	(2.68)	(1.00)	(2.48)
bigexport		0.167*	0.103*		0.139	0.0769
		(1.69)	(1.83)		(1.41)	(1.32)
time and firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
AP F-Test			30.18			28.97
SW F-Test			39.04			36.14
SW Chi-sq			117.2			108.5
N	27645	27645	20505	27645	27645	21432

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Add and drop IV

	(1) add	(2) add	(3) add-IV	(4) drop	(5) drop	(6) drop-IV	(7) add+drop	(8) add+drop	(9) add+drop-IV
export	0.0198	0.0364**	0.394**	0.00809	0.0181	-0.194	0.0230	0.0455	0.328
	(1.23)	(2.14)	(2.31)	(0.29)	(0.62)	(-0.50)	(0.77)	(1.47)	(0.81)
exportbig		-0.0548***	-0.177***		-0.0361	-0.238***		-0.0806***	-0.342***
		(-3.15)	(-4.34)		(-1.27)	(-4.00)		(-2.69)	(-5.45)
time and firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
AP F-Test			26.97			12.08			12.08
SW F-Test			35.36			16.11			16.11
SW Chi-sq			106.2			48.36			48.36
N	14625	14625	14625	11946	11946	11946	11946	11946	11946

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 9: Exporter Growth IV first stage

	(1) Output	(2) Output/worker	(3) levpet
product value * transport cost	0.656***	0.656***	0.748***
	(12.96)	(12.96)	(12.63)
(product value * transport cost)^2	-0.00248***	-0.00248***	-0.00281***
	(-12.54)	(-12.54)	(-12.12)
time and firm fixed effects	Yes	Yes	Yes
Observations	15071	15071	12836

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

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