Firms' Networks Under Special Economic Zones: Stylized Facts from Honduras

October 31, 2022

1 Context of SEZ in Honduras

The term "special economic zones" (SEZ) covers a broad range of zones, such as free-trade zones, export-processing zones, industrial parks, economic and technology-development zones, high-tech zones, science and technology parks, free ports, enterprise zones, and others Zeng (2016).

Though these zones differ from one another, they all share certain hallmarks. Broadly, four characteristics define the SEZ concept: (1) it is a geographically delineated area, usually physically secured; (2) it has a single management or administration; (3) it offers benefits for investors physically within the zone; and (4) it has a separate customs area (duty-free benefits) and streamlined procedures Group (2017)

Special economic zones has been widely used in emerging and transition economies to attract foreign investment, promote local economic expansion and employment, increase industrialization and exports efforts, among others policy objectives Zeng (2021). Outside the zones, governments pursue a different set of objectives such as fostering the surrounding local economic activity, technology transfer and develop a strong networks of suppliers Group (2017).

Free trade zones have a long tradition in Latin America. At the time, the region has approximately almost 500 SEZ, hosting more than 10,000 enterprises and employing about 1 million people. Unctad (2019) In Central America, special economic zones features varies widely across countries. Most of them drafted their current SEZ legislation during the 1990s and since then, the SEZ experienced important re-structuring processes Unctad (2019). In Honduras, this policies took more aggressive features by providing SEZ one of the highest levels of autonomy with its own political system, at a judicial, economic, and administrative level Editora (2013).

Because SEZ in Central America mostly invested in export oriented activities, the most important expected channel as spillover to the local economy is through the linkage within the supply chain, specifically the backwards linkages that occur with local firms as inputs or FDI service suppliers Farole (2012). Achieving linkages between foreign investors in SEZ and domestic suppliers has been a great challenge around the world, particularly for economies with low-skilled labor-intensive and scattered sectors such as Maquilas and garments. Despite the growing literature focusing on SEZ performance in exports quantities and diversification, technology transfer, less is known about the firm level performance, and even less has been explored on the association of firms under SEZ regimes and their supplier change in the local economy.

Moreover, literature regarding the SEZs in Honduras and specially analyzing the conditions of supplier firms networks for firms that benefit from a tax exception regime is to the best of our knowledge non available. We exploit rich administrative data to address this knowledge gap.

This analysis becomes increasingly relevant when we consider Honduras is one countries with higher tax expenditures in the LATAM region, which implies that tax exemption regimes are comparatively more costly in a context where the government needs for mobilizing resources increase for a sustainable economy recovery after the Covid pandemic.

In the last decade important questions arose about SEZ models sustainability and their effectiveness as a economic policy tool Farole (2012).

Additionally, The update of the Systematic Country Diagnostic in 2022 argues that "The maquila industry is not well integrated with the domestic economy because of its preferential tax treatment and regulatory incentives, thus it reinforces economic fragmentation. Hernandez Ore et al. (2015)" We are particularly interested in exploring this statement with the data and check the if there is any systematic difference in some characteristics that entails the level of integration with the local economy between firms benefiting from tax exemptions against those who are not.

2 Data

2.1 Limitations

2.2 Summary Statistics

in Table 6, we present descriptive statistics for firms in 2021, separately by status of exemption. We highlight some features of the data. First, comparing columns (1) No Exempt and (2) Exempt, we observe that firms benefiting from some type of exemption and the ones that doesn't are systematically different.

In Panel A we can see that Exempt firms are three times more likely to be corporations, less likely to be in the service sector, and in Panel B we can see that they are systematically larger across a range of indicators (assets, gross income, profits, and deductions). Panel C shows that Exempt firms are slightly more likely to fill the DMC (Declaracion Mensual de Compras) form where we can see that these firms benefiting from the tax exemption regimes has a higher number of suppliers and also a higher number of purchases per year. Second, inside the group of firms that benefit from any type of tax exemptions we compare those who are export oriented and the ones that aren't. Panel A shows that export oriented firms are more likely to be corporations, systematically larger firms in size, and less likely to be in the retail or service sector. Panel B shows that export-oriented firms have higher levels of assets and income and in Panel C we can see that also presents more suppliers and transactions per year. Conditional on being a corporation (almost all firms in export-oriented regime and 70% of those in non-export regimes).

3 Stylized Facts on Firms' Networks

As for the rest of the countries around the globe, the Honduran economy was hitted by COVID-19 pandemic. At the aggregate level, this event yielded to a drop of -9.0% of Gross Domestic Product (GDP) in 2020. Thus, becoming the largest dropout of economic activity in the country during the current century. At the micro level, Bachas et al. (2021) measured the magnitude of the shock, and show that firms' revenue fell by 26%, or 342.6 billion Lempiras (USD 14.3 billion), in real terms between March and August of 2020. Also they indicate that a non-negligible number of firms remained shut down. In this context, the production networks between domestic businesses might have been affected by the pandemic.

This section offers a narrative photography of firms' networks in Honduras excluding the potential distortions arising from the effects of COVID-19. In order to do so, we first make a series of restrictions in the overall sample. We restrict our sample to corporations filing taxes in 2021. Second, we exclude any firms that did not file any DMC in the period - since our focus is to compare the network of suppliers and we can only observe that for those firms filing DMC. This restricts our effective sample to 1,136 firms - 187 firms receiving exemptions linked to export-oriented regimes and 949 firms not exempted.

In Figure 2 we show that, even conditioning on corporations filing DMC, those enrolled in export-oriented regimes are still larger in terms of revenue than those not exempt - although there is ample overlap in the size of firms in both regimes. Second, in Figure 3 we show that in that restricted sample firms in the export oriented regimes often have more suppliers than those not-exempt: the distribution is clearly shifted to the right, with the median exempt firm declaring 126 suppliers vs. 50 suppliers for non-exempt firms.

We present differences in the mean number of suppliers in regression form in Table 3. In column (1) we document that while non-exempt firms declared on average 102 suppliers, those exempt declared almost 40 suppliers more on average. These difference is slightly lower when we control for which economic activity these firms perform. Nonetheless, above we documented that exempt and non-exempt firms are very different in terms of their revenue. This different fully explains their differences in number of suppliers: once we control for their (log of) revenue, the coefficient on exemption status becomes much smaller and not statistically different from zero. In column (4) we use the log of number of suppliers as an alternative specification: while the sign of the coefficient is positive, it is also no statistically different from zero. On column (5), we use the log of total domestic purchases as dependent variable and find a similar result: conditional on their size, exempt firms do not seem to purchase less from local suppliers. Finally in column (6) we use a dummy that indicates if a firm is an **importer** as dependent variable: even though overall firms in the export-regimes are much more likely to be importers than non-exempt ones, the effect is fully driven by their characteristics - once we control for firm size and sector, exempt firms are no more likely to be importers.

The previous results suggest two take-aways. First, firms in the export-oriented regime are large and have important connection with local suppliers: the median firm claim purchases from over 120 suppliers in 2021. It could be however, that these firms are not particularly well connected **conditional on their size**: since we know they are particularly large, they could be poorly connected for a large firm. Our second conclusion is that does not seem to be the case either: either in terms of number of suppliers or amount of local purchases, these export-oriented firms seem to be just as well connected to domestic suppliers as other large firms, not benefitting from the exemption regimes.

In the following sections, we turn to describing in more detail the nature of these networks of suppliers and how they might differ for firms that are in the export-oriented regimes using the full sample between 2018-2021.

This section explores several stylized facts on location and distance between firms and suppliers. Some of the results reported throughout this section are based on Ureña et al. (2018) and Bernard et al. (2019).

Fact N° *Exempt firms are over represented in San Pedro Sula and Tegucigalpa.* In absolute terms, the municipalities with higher presence of firms under tax exempt status are Distrito Central, San Pedro Sula and Choloma.However, there are municipalities that shows a higher relative presence of exempt firms (denoted ad the share of exempt firms under total firms) and for this case, the top three municipalities are Jose Santos Guardiola, in the Map 1 we can see that i

Fact N° *Larger firms have suppliers in more locations.*
Panel of figure 4 suggest that firms buy from different municipalities. As reported by figure 4a, conditional on exemption status, non exempt and exempt export-oriented firms buy from suppliers located, on average, in 13 different municipalities. However, the mean among the two groups of firms is not different from zero. In addition, figure 4b shows that larger firms have suppliers in more locations. This latter finding is in line with those made by Bernard et al. (2019) for Japan.

Fact N° *The distance between client and suppliers is higher for larger exempt export-oriented firms.*
As shown in panel of figure 5, there are heterogeneities in distances for the different type of firms. Figure 5a exhibits that, conditional on exemption status, firms under export-oriented regimes make purchases, on average, from farther suppliers regard to non-exempt firms. Moreover, larger firms (exempt or not) face higher distances to suppliers (see figure 5b), which is consistent with Bernard et al. (2019) for Japan.

Fact N° *Firms buy more from closer suppliers, irrespective to exemption status.*
The panel of figure 6 shows the share for the value of purchases and number of transactions by deciles on distance. Figure 6a shows that, on average, the 60% from the total value of purchases made by non-exempt firms and the 47% made by exempt export-oriented firms, comes from their nearest suppliers. This share decreases along distances since the value of purchases made from the more distant suppliers only account, on average, for the 3% of total purchases for non exempt firms and the 17% of total purchases for exempt export-oriented firms. On the other hand, figure 6b shows the exact same fact for the number of transactions. Exempt firms make, on average, up to 58% of their annual transactions with their nearest sellers, while exempt export-oriented firms do the 53%. When it comes to the more distant suppliers, the share of total transactions drops, on average, up to 5% and 9% for the non-exempt and exempt export-oriented firms, respectively. It should be noticed that these results are not driven by

firm size, so smaller and larger clients rely over the half of their purchases and number of transactions from their closest peers.

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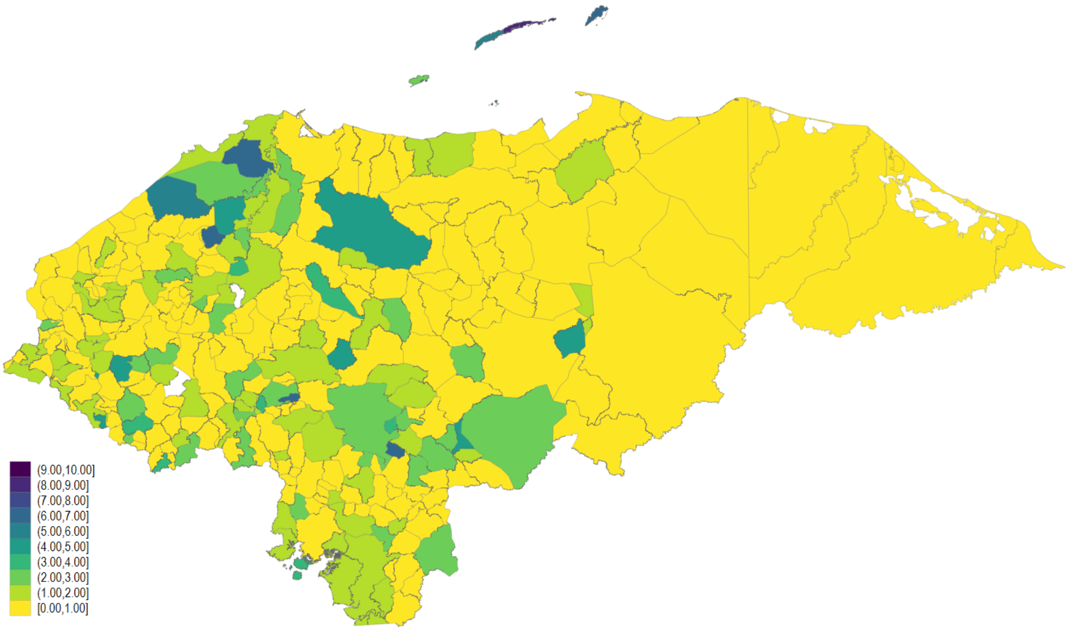
4 Figures and Tables

Figure 1: Exempt firms share, pooled sample



Note: This figure represents the total exempt firms divided by the total firms by municipality and multiplied by hundred. The calculation was made with the pooled sample data 2018-2021

Figure 2: Density of gross income, 2021

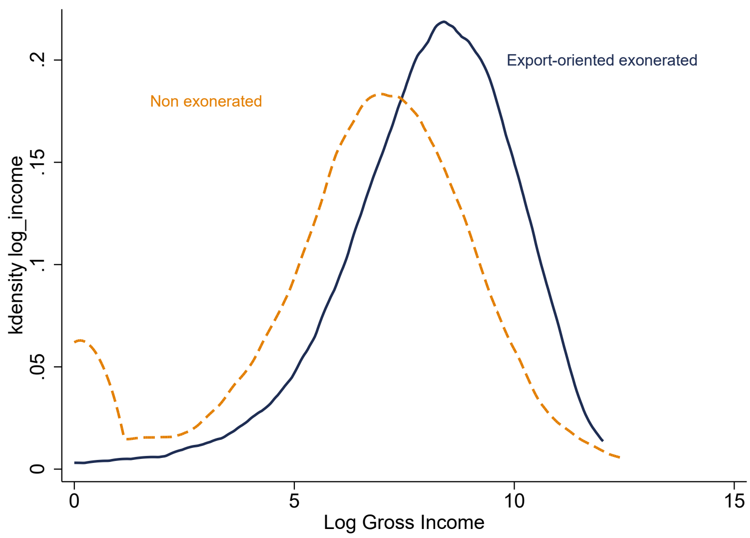


Table 1: Descriptives by Fiscal Status

	No Exempt	Exempt	Exempt-Export	Exempt-Others
Panel A: Firm Characteristics				
Corporate	21.16	71.53	99.78	68.50
	(40.85)	(45.13)	(4.67)	(46.46)
Small Firm Size	99.36	95.96	73.58	98.36
	(7.99)	(19.70)	(44.14)	(12.71)
Retail Firm	22.70	29.85	13.97	31.55
	(41.89)	(45.76)	(34.71)	(46.48)
Services Firm	23.09	14.80	2.84	16.08
	(42.14)	(35.51)	(16.62)	(36.74)
Total net assets (100,000 L)	109.94	1326.32	7123.45	703.94
	(6749.66)	(9748.22)	(15701.48)	(8649.82)
Total fixed assets (100,000 L)	33.62	750.38	3352.04	471.06
	(920.35)	(11170.39)	(9559.33)	(11295.15)
Total gross income (100,000 L)	75.66	816.29	6050.94	254.29
	(1647.91)	(6869.84)	(14725.88)	(5076.25)
Total Net Income (100,000 L)	6.20	39.56	301.36	11.46
	(210.36)	(1326.23)	(1473.31)	(1306.54)
Total deductions (100,000 L)	69.46	776.72	5749.58	242.83
	(1496.96)	(7460.32)	(14201.99)	(6089.37)
Panel D: DMC Client				
Taxpayer files DMC on suppliers	0.01	0.06	0.41	0.02
	(0.09)	(0.23)	(0.49)	(0.14)
Number of suppliers by client	114.29	151.03	154.95	142.69
	(202.19)	(167.87)	(177.54)	(145.79)
Number of purchases per year	265.80	365.58	388.73	316.39
	(463.06)	(400.64)	(426.11)	(337.24)
Total sales Client (100,000 L)	797.42	1188.40	1454.20	623.60
	(7363.72)	(3823.87)	(3888.42)	(3640.22)
Panel D: DMC Supplier				
Taxpayer is reported by buyers on DMC	0.25	0.27	0.54	0.25
	(0.43)	(0.45)	(0.50)	(0.43)
Number of clients by supplier	4.32	5.99	10.91	4.83
	(14.49)	(19.06)	(20.12)	(18.62)
Number of sales per year	9.98	18.29	33.18	14.79
	(40.13)	(116.86)	(57.16)	(126.65)
Total sales Supplier (100,000 L)	24.96	193.18	688.03	76.80
	(638.48)	(1344.40)	(1924.31)	(1137.33)
Number of Firms	138,036	4,724	458	4,266

Note: This table presents descriptive statistics by groups of tax exempt firms. No exempt firms are those who doesn't rely on any type of tax exempt regimes. Exempt firms are the total group of firms that rely on at least one type of tax exempt regime. We then show this last group separated by export oriented tax exemption regimes and non export-oriented. All data is for year 2021.

Table 2: Descriptives TTEST

	No Exempt			Exempt-Export		TTest
Panel A: Firm Characteristics						
Corporate	21.16	(40.85)		99.78	(4.67)	-321.60
Small Firm Size	99.36	(7.99)		73.58	(44.14)	12.50
Retail Firm	22.70	(41.89)		13.97	(34.71)	5.37
Services Firm	23.09	(42.14)		2.84	(16.62)	25.79
Total net assets (100,000 L)	109.94	(6749.66)		7123.45	(15701.48)	-9.56
Total fixed assets (100,000 L)	33.62	(920.35)		3352.04	(9559.33)	-7.43
Total gross income (100,000 L)	75.66	(1647.91)		6050.94	(14725.88)	-8.68
Total Net Income (100,000 L)	6.20	(210.36)		301.36	(1473.31)	-4.29
Total deductions (100,000 L)	69.46	(1496.96)		5749.58	(14201.99)	-8.56
Panel D: DMC Client						
Taxpayer files DMC on suppliers	0.01	(0.09)		0.41	(0.49)	-17.44
Number of suppliers by client	114.29	(202.19)		154.95	(177.54)	-2.81
Number of purchases per year	265.80	(463.06)		388.73	(426.11)	-3.57
Total sales Client (100,000 L)	797.42	(7363.72)		1454.20	(3888.42)	-1.79
Panel D: DMC Supplier						
Taxpayer is reported by buyers on DMC	0.25	(0.43)		0.54	(0.50)	-12.46
Number of clients by supplier	4.32	(14.49)		10.91	(20.12)	-5.13
Number of sales per year	9.98	(40.13)		33.18	(57.16)	-6.35
Total sales Supplier (100,000 L)	24.96	(638.48)		688.03	(1924.31)	-5.40
Number of Firms	138,036	458	138,494			

Note:

Figure 3: Number of suppliers by exemption status, 2021

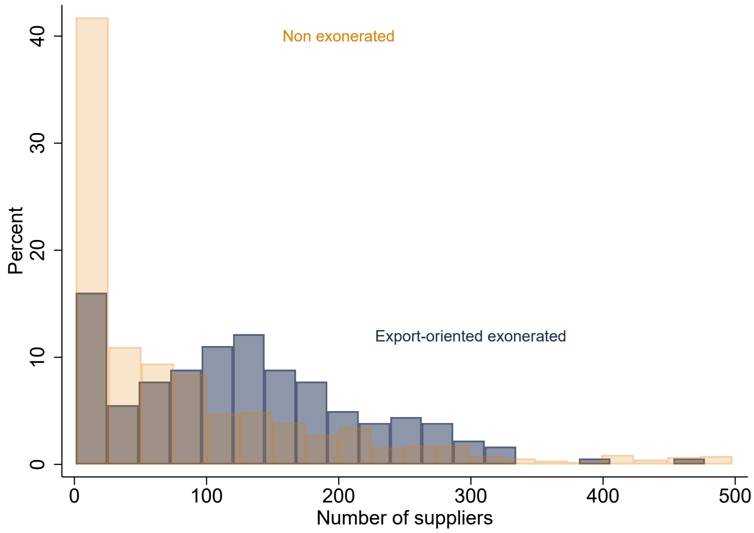
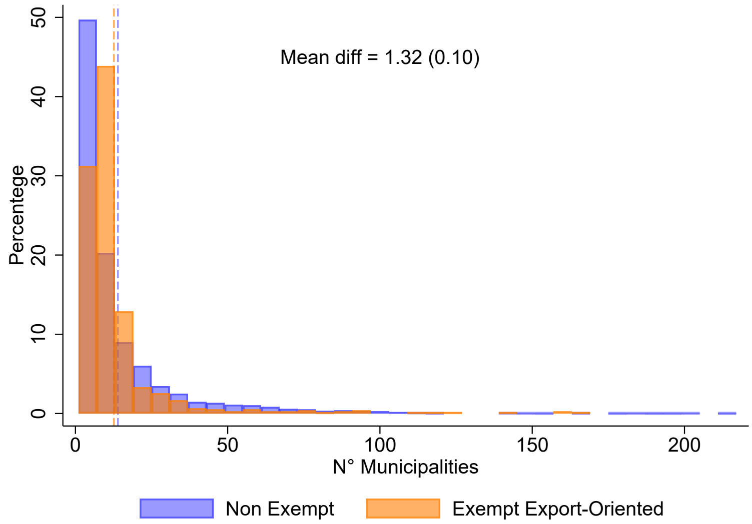


Table 3: Regression: outcome number of suppliers by firm

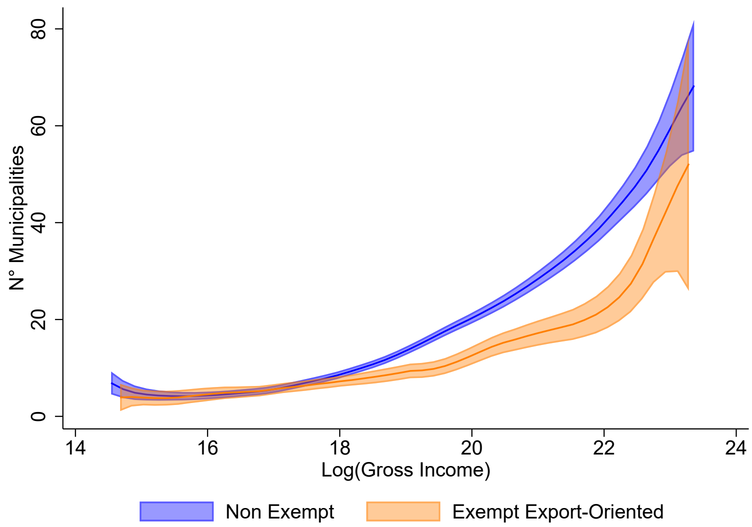
	(1)	(2)	(3)	(4)	(5)	(6)
Dummy for exonerated firm	37.39***	32.69***	-9.067	0.161	0.0280	-0.00768
	(10.23)	(10.95)	(9.457)	(0.112)	(0.236)	(0.0354)
Sector: Retail		26.40***	-0.111	-0.162*	-0.0573	0.430***
		(9.289)	(7.946)	(0.0944)	(0.198)	(0.0298)
Sector: Indutry		22.30**	5.626	-0.0620	0.157	0.304***
		(9.795)	(8.312)	(0.0987)	(0.207)	(0.0311)
Sector: Services		-22.01	18.93	-0.110	-0.225	0.0158
		(23.23)	(19.72)	(0.234)	(0.491)	(0.0739)
log_income			25.95***	0.468***	1.216***	0.0663***
			(1.217)	(0.0145)	(0.0303)	(0.00456)
Constant	102.4***	90.83***	-63.08***	0.585***	6.804***	-0.214***
	(4.150)	(5.800)	(8.725)	(0.104)	(0.217)	(0.0327)
Observations	1,136	1,136	1,136	1,136	1,136	1,136
R-Squared	0.01	0.02	0.30	0.51	0.61	0.34
Dep. Var. mean	108.5	108.5	108.5	108.5		

Note: This table presents results of regressions where the dependent variable is the number of suppliers by firm (columns 1 - 3) or the log number of suppliers (column 4). The number of suppliers is winsorized at the 95th percentile. The sample only includes corporations filing taxes in 2021. Only firms in the export-oriented regime are included.

Figure 4: Number of different supplier locations



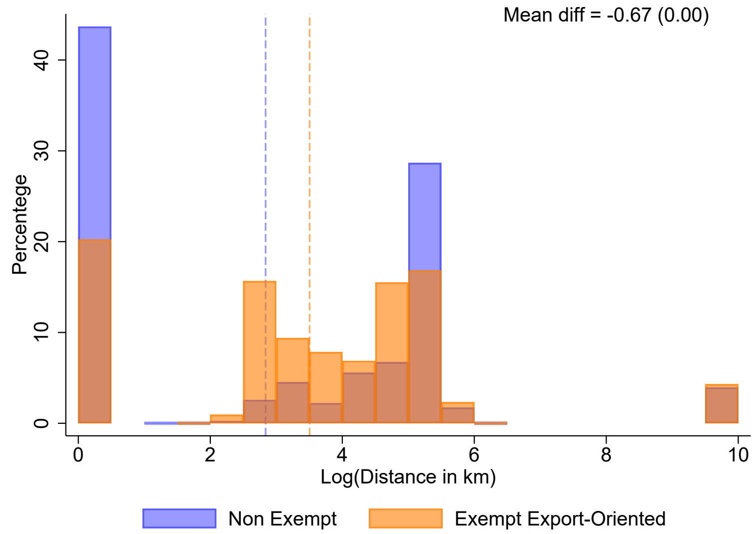
(a) Number of municipalities by exemption status



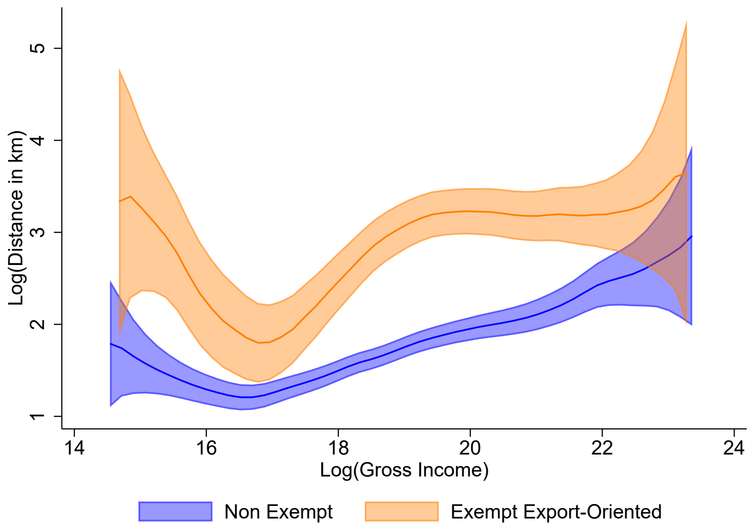
(b) Number of municipalities by exemption status and size

Note: Own calculations on pooled sample between 2018-2021. Figure 4a plots the distribution for the number of different suppliers location. T-test on difference in means and its p-value are reported. Figure 4b presents the two degree local polynomial regression of the number of different supplier's municipalities at the firm-level (vertical axis) on firm size, measured by gross annual income reported at the CIT form (horizontal axis). Each line comes from a different regression, and shaded areas correspond to the 95% confidence interval. Before estimations, data was trimmed on the first and last percentile of income.

Figure 5: Distance to suppliers



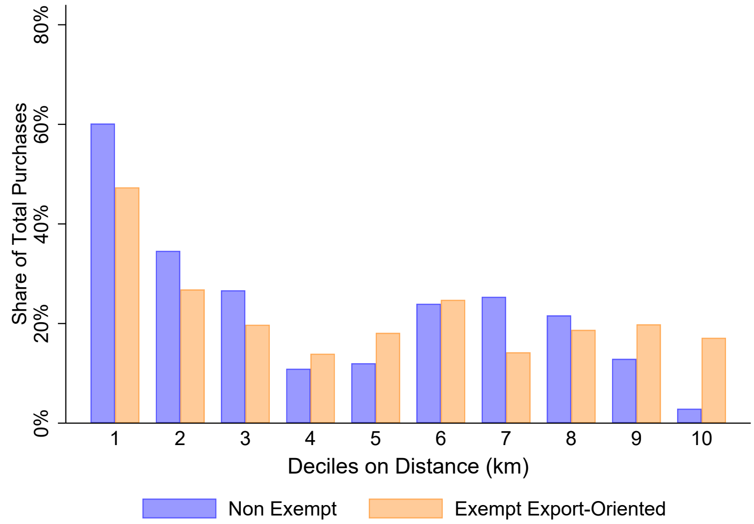
(a) Distance with suppliers by exemption status



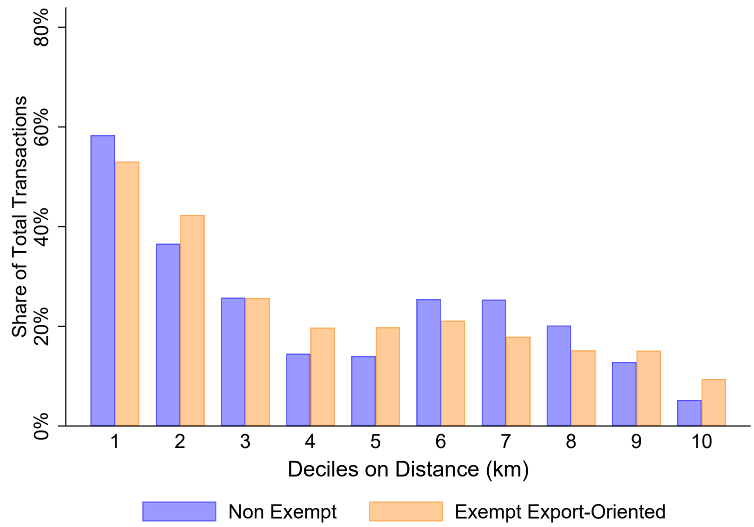
(b) Distance with suppliers by exemption status and size

Note: Own calculations on pooled sample between 2018-2021. Figure 5a plots the distribution of distance between customers (filling DMC) and their suppliers. T-test on difference in means and its p-value are reported. Figure 5b presents the two degree local polynomial regression of median distance to suppliers at the firm-level (vertical axis) on firm size, measured by gross annual income reported at the CIT form (horizontal axis). Each line comes from a different regression, and shaded areas correspond to the 95% confidence interval. Before estimations, data was trimmed on the first and last percentile of income.

Figure 6: Purchases value and number of transactions by distance



(a) Value of purchases by distance



(b) Number of transactions by distance

Note: Own calculations on pooled sample between 2018-2021. This figure shows the average share of purchases (number of transactions) that each decile of distance in kms accounts in the total value of purchases (number of transactions) per year. To calculate this share, we compute the sum of purchases (number of transactions) by each decile of distance between client and suppliers, and then that value is divided by the total value of purchases (number of transactions) for every year. Finally, we collapse the mean by decile and exemption status.

5 Appendix

Table 4: Main type of Tax Exemption Regimes in Honduras.

Tax Regime	Description	Validity Period
The Free Zones Law (ZOLI)	Aims to confer free zone status to the entire national territory of Honduras, where national and foreign commercial and industrial companies can be established and operate, basically engaged in export and related activities. or complementary.	1998 -
Temporary Import Regime (RIT)	Is a mechanism to encourage exports by companies that do not receive the benefits contemplated in other laws in force in Honduras. Companies must apply to benefit from the Temporary Import Regime before the General Directorate of Productive Services of the Ministry of Industry and Commerce.	1984 -
Constitutive law of agricultural export zones (ZADE)	creates agricultural export zones, privately owned and managed, with the purpose of promoting, through the use of local labor, agricultural production oriented exclusively to export, through the establishment in the country of agricultural export companies	2001

Table 5: Number of Taxpayers Filling DMC
on Local Purchases at Least Once

Preferential Regime	2018	2019	2020	2021
A. Export Oriented				
ZOLI	143	143	137	131
RIT	61	70	64	55
ZADE	1	1	1	1
B. Non-Export Oriented				
Turismo*	35	34	27	26
Otros regímenes	9	9	8	7
Otros exonerados	36	15	11	11
Cooperativas	16	29	29	25
MIPYMES	0	1	1	5
Sector social de la economía	0	1	1	1
APP	0	0	1	1
Energía Renovable	10	10	10	11
Call Centers	0	1	1	1
Total	311	314	291	275

Source: own elaboration. *The preferential regime labeled as “Turismo" is the sum of firms advocated under tax incentives for the tourism sector such as Zonas Libres Turísticas (ZOLT), Zona Libre Turística de Islas de la Bahía (ZOLITUR), Ley de Incentivos al Turismo (LIT) e Incentivos al Turismo.

Table 6: Descriptives by Regime

	ZOLI Free Zones Law	RIT Temporary Import Regime Law	ZADE Law of Export Zones	Otros Includes Othe Regimes Grou
Dummy for exonerated taxpayers	1.0	1.0	1.0	0.0
	(0.0)	(0.0)	(0.0)	(0.1)
Panel A: Firm Characteristics				
Corporate	99.8	100.0	100.0	21.8
	(4.5)	(0.0)	(0.0)	(41.3)
Small Firm Size	74.4	54.5	0.0	99.2
	(43.7)	(49.9)	(0.0)	(9.1)
Retail Firm	15.7	9.3	0.0	22.4
	(36.4)	(29.0)	(0.0)	(41.7)
Services Firm	3.2	0.8	0.0	22.5
	(17.7)	(9.0)	(0.0)	(41.7)
Panel B: Firms Financial Indicators				
Total net assets (100,000 L)	5880.4	7857.2	60655.9	158.8
	(13197.8)	(15769.3)	(927.2)	(14719.6)
Total fixed assets (100,000 L)	2391.4	5743.9	31241.8	54.1
	(6055.8)	(15465.1)	(1448.4)	(1767.1)
Total gross income (100,000 L)	4765.6	8530.9	18291.2	91.4
	(12499.4)	(17491.3)	(4596.5)	(1774.1)
Total Net Income (100,000 L)	189.9	449.0	3324.1	6.1
	(776.1)	(2150.6)	(981.7)	(286.6)
Number of Firms	1,459	367	4	543,124