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Abstract

Unincorporated enterprises often bypass formal regulations in general and taxation in particular. Bringing unincorporated enterprises under taxation system is a challenge often faced by tax administrators and it is in this regard the present study explores the factors which influence decision of unincorporated enterprises to get registered with State Value Added Tax (VAT)/ sales tax authority. This analysis is limited to the decision regarding registration. It is not necessary that enterprises which are registered will pay taxes and/or file return- however; the process of registration does provide some information to the tax department for follow up. The study throws up some interesting results for policy makers and tax administrators.

Key Words: Tax Registration, Unincorporated Enterprises, Informality, Value Added Tax (VAT), Partnership Firms, Proprietary Enterprises, Probit Model, India.

JEL Classification Codes: H25, H32, H26, L53

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Introduction

The first step towards participation in most tax regimes is registration in the regime. The existence of an informal sector in most economies, perhaps larger informal economies in developing countries, where the agents do not participate in the tax regime raises concerns for tax departments. From the taxpayers' perspective, being in the tax regime would be associated with certain costs and certain benefits. If the costs exceed the benefits, it is expected that the taxpayer would choose to remain outside the realm of taxation. Some studies have explored whether formalisation helps a firm in increasing its value added or profits (see for instance, Demenet, et al, 2016; and McKenzie and Sakho, 2010). Participation in the tax system is important for tax administration as well since it can crucially influence tax revenue as well as tax morale in the country (Hofmann et al., 2008). The present paper is an attempt to identify the factors that might influence the decision of the enterprises to register for taxes, specifically for the value added tax.

For India, the study acquires added importance in the context of introduction of the Goods and Services Tax (GST) regime. With a reduction in the extent of cascading in the tax regime, it is argued by some, that move to GST would result in expansion of economic activity. Since this new tax regime works through more integrated and redefined supply chains, for units to benefit from this new tax regime and for the success of the new regime, it is important that more and more firms find it useful to be a part of the GST regime. While firms and enterprises in the organised sector do participate in the GST regime, those in the unorganised sector may not be as well integrated. This poses a problem both for the units and the tax administration. For the former, apart from being unable to benefit from the growth enhancing processes in the economy, these units may also be subject to irregular visits by various authorities potentially associated with the payment of bribes. For the tax department, non-participation by a segment of the economy can induce lower confidence in the tax regime resulting in higher non-compliance even among segments which would normally pay taxes.

It is the purpose of this paper to examine within the space of unincorporated sector, the extent of participation in the tax regime among enterprises which are required by law to participate and then to identify characteristics of enterprises which could be associated with non-participation. This analysis is undertaken with a focus on state VAT regimes in India. The focus is not on the amount of taxes paid but on whether the enterprise is registered with the tax department or not. This exercise can provide some inputs for designing policies to bring these enterprises into the mainstream.

The paper is organised as follows: the following section explores definitions of informal economy or unorganised economy in a country like India. In section 3 we provide brief literature review on registration under VAT and informality. This is followed by description of the database and restrictions imposed to select the sample enterprises. We explore the factors that could influence VAT registration of enterprises in section 5. We provide detailed methodology to econometrically understand the differences in behavior across enterprises – more specifically,

binary choice Probit models are estimated to explore factors that influence the decision of enterprises to register with the VAT department and discuss results in section 6. The final section provides some concluding observations.

2. Searching for a Definition of Informality

Reducing informality is often seen as one of the central objectives of tax reforms (Kanbur and Keen, 2015), and proposed GST system for India also envisages that informality will go down. However, reducing informality "may not be a useful guide to making tax policy" (Kanbur and Keen, 2015). For one, there are many definitions of informal economy or unorganised economy in a country like India. The definition of informality set out by ILO (2013) is based on labour and enterprise regulation rather than on tax consideration. In fact all Acts and Rules in India consider size of employment and capital investment to classify the sector into registered and unregistered (or organised vs. unorganised). To provide an overview of the differences in definitions adopted by different regulators in India, we summarise some of the important regulations which deal with the informal/ small/ unorganised economy in India.

Indian manufacturing sector is categorised into organised and unorganised activities based on status of registration under Indian Factories Act, 1948. Indian Factories Act, 1948 (under section 2(m)) defines 'factories' (organised activities) as those:

> (i) whereon <u>ten or more workers</u> are working, or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on <u>with the aid of power</u>,[1] or is ordinarily so carried on, or

>   (ii) whereon <u>twenty or more workers</u> are working, or were working on any day of the preceding twelve months, and in any part of which a manufacturing process is being carried on <u>without the aid of power</u>, or is ordinarily so carried on.[2]

Therefore, Indian Factories Act defines organised and unorganised manufacturing on the basis of number of workers and the source of energy. In this definition, no consideration is given to registration with tax authority to define organised manufacturing.

The Micro, Small and Medium Enterprises Development (MSMED) Act, 2006 is applicable for enterprises engaged in manufacturing / production of goods (pertaining to an industry specified

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[1] According to Indian Factories Act, "power" means electrical energy, or any other form of energy which is mechanically transmitted and is not generated by human or animal agency.

[2] However, it does not include a mine subject to the operation of the Mines Act, 1952 (35 of 1952), or a mobile unit belonging to the armed forces of the Union, a railway running shed or a hotel, restaurant or eating place. For details see http://dgms.gov.in/writereaddata/UploadFile/Factories%20Act,%201948.pdf (last accessed on 24 June 2017)

in Industries Development and Regulation Act, 1951) or engaged in providing or rendering of services. The MSMED Act defines enterprises as follows:

Type of Enterprise	Manufacturing Industries – Investment in Plant & Machinery	Service Industries – Investment in Equipment
Micro Enterprise	Not exceeding INR 2.5 million	Not exceeding INR 1 million
Small Enterprise	More than INR 2.5 million to INR 20 million	More than INR 1 million to INR 20 million
Medium Enterprise	More than INR 20 million to INR 100 million	More than INR 20 million to INR 50 million

Note: USD 1 = INR 64.07 (as on 25 June 2017)

Enterprises falling under this definition are required to register under the MSMED Act and file the Information Memorandum with prescribed authorities in such manner as prescribed under the act.

In this definition, size of investment in plant and machinery (for manufacturing enterprises) or equipment (for service providers) is the only factor taken for consideration and once again there is no requirement for registration with any tax authority.

Depending on registration under Indian Companies Act, 1956 businesses are classified as incorporated and unincorporated entities. There are a few options for businesses to organise their business and registering under the Indian Companies Act is one such option. Other options are Firms (partnership), Association of Persons (AOPs), Body of Individuals (BOIs), proprietary enterprise, charitable entities, self-help groups, trusts, others. Tax treatments (under direct tax) of these business organisations vary where Corporates and Firms are subject to pay Corporate Income Tax, AOPs, BOIs and proprietors face income tax similar to individuals, co-operative societies face different tax rate.

In sampling the unorganised enterprises in India, the National Sample Survey Office divides proprietary enterprises further into two categories, own account enterprises (OAE) and establishment. The establishment is further divided into non-directory establishment and directory establishment. The definitions of them are as follows:

a) Own-account Enterprise (OAE): An enterprise, which is run without any hired worker employed on a fairly regular basis,[3] is termed as an own account enterprise.
b) Establishment: An enterprise which is employing at least one hired worker on a fairly regular basis is termed as establishment. Paid or unpaid apprentices, paid household member/servant/resident worker in an enterprise are considered as hired workers.

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[3] Here "fairly regular basis" means the major part of the period when operation(s) of an enterprise are carried out during a reference period.

(i)   Non-directory establishment (NDE): An establishment having one to five workers (household and hired taken together) is termed as a non-directory establishment.

(ii)   Directory establishment (DE): A directory establishment is an establishment, which has got six or more workers (household and hired taken together).

In addition to above Acts, businesses are also required to register under different acts, such as Shops and Establishment Act,[4] Trade License (Municipal Corporation/ Panchayats/ Local Body),[5] Value Added Tax (VAT)/ Sales Tax Act, Provident Fund Act,[6] Employees State Insurance Corporation Act etc. which in turn have their own definitions on who is required to register.[7] Of these, the tax regime uses the turnover of the enterprise as the basis for determining whether an enterprise needs to be registered or not.

The above discussion shows that there are multiple definitions under different acts to define/ categorise businesses in India. The existence of different definitions under different acts may be due to the purposes for which the acts were established. However, broadly number of workers and investment in plant and machinery (or equipment) are the major indicators chosen to classify the activities. But tax policy tends to focus on incomes or on turnovers rather than investment or employment. In other words, while the other regulations focus on the processes involved in the economic activity, the tax department is more focused on the outcome of the activity. While there can be some overlaps in these different definitions, there is no reason to expect them to converge completely. In studying informality with respect to taxes, therefore, it is useful to focus on the variable of interest in defining tax liability, i.e., incomes or turnover as the case may be.

If one considers informality with respect to taxes, then there can be two types of agents in the informal sector. There may be instances when businesses legally obliged to pay taxes do not pay it and alternatively, there may be instances when businesses are not legally obliged to pay the taxes (either VAT or income tax) as their annual turnover or income falls below the threshold.[8]

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[4] Related to the regulation of hours of work, payment of wages, leave, holidays, terms of service and other conditions of work of persons employed in shops, commercial establishments, establishments for public entertainment or amusement and other establishments and to provide for certain matters connected therewith.

[5] Trade License is a certificate/document which grants the permission to carry on a particular trade or business for which it is issued. It does not confer ownership of property or permission for any other activity other than for which it is issued.

[6] Employees' Provident Fund Organisation (EPFO) established under the Employees' Provident Funds & Miscellaneous Provisions Act, 1952 to provide institutional support for provident funds, pension fund and deposit-linked insurance fund for employees in factories and other establishments. http://www.epfindia.com/site_docs/PDFs/Downloads_PDFs/EPFAct1952.pdf (last accessed on 25 June 2017).

[7] The promulgation of Employees' State Insurance Act, 1948 envisaged an integrated need based social insurance scheme that would protect the interest of workers in contingencies such as sickness, maternity, temporary or permanent physical disablement, death due to employment injury resulting in loss of wages or earning capacity. The Act also guarantees reasonably good medical care to workers and their immediate dependents. http://esic.nic.in/esi_act.php (last accessed on 25 June 2017).

[8] Unlike income tax, VAT is not the direct cost to the enterprises unless entrepreneurs decide not pass on the costs to the next level of value addition or consumers.

Turning to the state VAT regimes in India, the rules do vary somewhat across states. In most states, all businesses are not legally required to be registered under VAT – any business with turnover below a certain threshold which does not undertake inter-state or international trade is not required to be registered. Further, even if they are registered, if their annual turnover is below the prescribed threshold for VAT registration, they do not have to pay taxes. The obligation to file tax return also varies across states. For some states, filing tax return under VAT/ sales tax is mandatory for all registered businesses even if they have zero annual turnovers (e.g., Maharashtra) whereas in others, filing is mandatory for registered businesses only if their annual turnover crosses the VAT threshold.

However to participate in the tax regime, it is essential to register with the tax department. It might be argued that any business that registers with the tax department would either file a return or expect to file a return sometime in the near future. Considering registration therefore as an expression of intent to participate in the tax regime, the present study seeks to analyse this decision of unincorporated enterprises.

3. Literature Review

There are many studies which build theoretical models to understand the effects of VAT on informality (Boadway and Sato 2008, Emran and Stiglitz 2005, Keen 2008, Tumen 2016, Keen and Mintz 2004, Piggott and Whalley 2001, de Paula and Scheinkman, 2010, Joshi et al., 2014, Kanbur and Keen, 2014). There is also an emerging body of studies which empirically explore the factors influencing the registration for VAT. In this paper, given our focus, we explore the latter which look into the "role of the value added tax (VAT) in transmitting informality" (de Paula and Scheinkman 2010).

For the Brazilian context (48,701 entrepreneurs in urban regions from all states in the Brazilian federation), de Paula and Scheinkman (2010) finds that tax registration is influenced by location of the firm (outside household), number of employees, revenue, having accesses to bank loan, education level of the owner, age of the owner, square of age of the owner, gender of the owner, product of home ownership and number of rooms in the home positively and significantly, whereas owner having access to another job influences tax registration negatively and significantly. The results show that location of the business or visibility matters in deciding whether to take tax registration. Firms located outside the household are more visible to regulators as compared to those operating from the premises of the household. Other factors related to the size of the business like number of employees and size of the revenue push the firms to take tax registration perhaps to get integrated with larger chains of businesses. Factors like access to bank loans pull the firms to take tax registration for easy access to formal credit, perhaps at a lower rate of interest. Owner specific factors like age, education level, gender, having other job, home ownership and size of the home in terms of number of rooms determine

the socio-economic background of the entrepreneur which influence their decision to take tax registration.

4. Data

If we define informality with specific to status in tax registration, there are some common perceptions about characteristics of informal sector. We attempt to test some of these characteristics with specific to unincorporated enterprises in India. Before dealing with characteristics and their support from literature, it would be worthwhile to provide a brief description of the database.

National Sample Survey Office (NSSO) conducts quinquennial surveys on unincorporated enterprises.[9] This paper is based on unit level data of the 67th round survey of NSSO (NSSO 2012a).[10] In short, NSSO captures characteristics of the bottom strata of enterprises engaged in manufacturing, trading and services. A detailed description of the data is provided in Mukherjee and Rao (2015). For the present paper, we have restricted to our analysis to proprietary and partnership enterprises, as tax status of other categories (e.g., self-help groups, trusts) are not clear (Mukherjee and Rao, 2015).

We have restricted our sample to proprietary enterprises and partnership firms engaged in manufacturing and/or trading activities. The rationale for excluding services is that majority of the service providers are not required to be registered under state VAT/ sales tax act (e.g., Transportation and storage activities, Postal and courier activities, Information and communications, Financial and insurance activities, Real estate activities, Educational activity and Human health and social work activity). Further, since we would like to identify any state specific features as well, we have excluded states with very few observations. In particular, we have excluded any state which has less than 100 observations. Given that the focus of the present exercise is on businesses that are required to be registered, we have excluded all enterprises with turnover below the exemption threshold for the state in which they operate. Present VAT registration threshold varies across states and some states have different thresholds for manufacturer vis-à-vis trader – e.g., Chhattisgarh, Gujarat, Himachal Pradesh (Table A1 in Appendix). We have restricted our sample size to only those enterprises whose annual turnover is higher than the prescribed threshold for VAT registration of the state where they are operating.

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[9] According to NSSO (2012b), unincorporated enterprises imply not registered under the Companies Act, 1956. Further the domain of 'unincorporated enterprises' excluded (a) enterprises registered under Sections 2m(i) and 2m(ii) of the Factories Act, 1948 or bidi and cigar manufacturing enterprises registered under bidi and cigar workers (condition of employment) Act, 1966, (b) government/public sector enterprises and (c) cooperatives. Thus the coverage was restricted primarily to all household proprietary and partnership enterprises. In addition, Self Help groups (SHGs), Private Non-Profit institutions (NPIs) including Non-Profit Institutions Serving Households (NPISH) and Trusts.

[10] The survey was conducted during June 2010 to July 2011.

Since registration of enterprises having annual turnover lower than the prescribed threshold is voluntary, we have considered only those enterprises which are legally required to be registered under the VAT/ Sales Tax Act of the respective state of their operation.[11]

With all the restrictions (cleaning up of data), we are left with 47,528 observations, of which 11,729 enterprises (24.7 percent) are registered, 19,675 enterprises (41.4 percent) are unregistered and 16,124 enterprises (33.9 percent) did not reveal their registration status during survey. All 47,528 sample enterprises are supposed to be registered under VAT, as their annual turnover is above the prescribed threshold for VAT registration, however only one-fourth of them are currently registered (Table A2 in Appendix). We have excluded enterprises who did not reveal their registration status during survey from our sample. Therefore, effectively our sample size becomes 31,404 (Table A2 in Appendix).

In order to capture State specific factors influencing registration, we have included state dummies. However, out of 20 states we have selected for our analysis, one state is to serve as base state. The selection of the base state is based on average per capita Gross State Domestic Product (GSDP) during 2009-10 to 2011-12.[12] The State having per capita GSDP close to median (Quartile 2) could be the base state. We found that Karnataka had average per capita GSDP of INR 45,227 which is approximately close to quartile 2 (INR 43,721) and therefore we have selected Karnataka as the base state (Table A1 in Appendix).

5. Factors that could influence VAT registration

5.1 Access to Credit Market

Access to formal credit market is often cited as one of the major factors influencing entrepreneurs' decision to become formal entity (Araujo and Rodrigues Jr. 2016, de Paula and Scheinkman 2010, de Paula and Scheinkman 2011). Higher interest rate in informal credit market and limited bargaining capacity of informal entrepreneurs in setting the interest rate and/or terms and conditions for repayment of loans and interest could be the factors influencing informal entrepreneurs to continue as informal entity. However, if informal entrepreneurs draw significant part of their credit requirement from informal creditors, they need to keep a

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[11] Though enterprises having annual turnover below the prescribed threshold for VAT registration could register with State Tax Authority voluntarily, we have not considered this set of enterprises in our analysis as factors influencing their decision to register under VAT Act could be different from those whose annual turnover above the threshold. We found that only 1.6 percent of sample enterprises (after applying all data restrictions) having annual turnover below VAT registration threshold are registered (Appendix Table A1). States where VAT registration is high also witness higher instances of voluntary registration. Among those enterprises, majority of them are engaged in manufacturing of computer, electronic and optical products, manufacturing of pharmaceuticals, medicinal chemical and botanical products.

[12] The data of Gross State Domestic Product (GSDP) at factor cost (constant 2004-05 prices) (2004-05 series) is taken from EPWRF (http://www.epwrfits.in/).

significant part of their transactions out of books of accounts so that they could repay the loans and interest in cash. This could imply that they might choose not to register under sales tax/ VAT and open up their books of accounts to the tax administration for scrutiny. Therefore, under this argument the status quo should continue and informal entrepreneurs should never become formal entities. In the sample under study, we found that both registered and un-registered enterprises take loan from both formal and informal creditors (see Table 1). Therefore, it appears that sales tax/ VAT registration is not a binding constraint to access credit from formal sources. To establish credit worthiness, the promoters of the enterprises need to file tax returns under direct taxes. However from the present database it cannot be confirmed whether the promoters of the enterprises were complying with income tax requirements.[13]

To get a sense of how the sample firms behave, out of a total 31,404 enterprises, only 6,859 have reported to have taken credit from the formal sector and/or from the informal sector.[14] Only 28 percent of registered and 18 percent unregistered enterprises have taken credit. Table 1 presents a comparison of the credit taken and the associated interest rates reported by both un-registered and registered enterprises. Table 1 shows that 53 percent un-registered enterprises obtained credit only from formal sources, whereas 21 percent of registered enterprises have taken credit only from informal sources. In other words, registration under VAT Act is neither necessary nor sufficient condition to obtain credit from formal sources. Though majority of registered enterprises obtained credit from formal sources, more than one-fifth of the registered enterprises obtained credit only from informal sources. Only a small percentage of enterprises obtained credit from both the sources. There are significant differences in the average size of the outstanding loan between registered and un-registered enterprises across all sources of credit. One possible reason for this difference could be relative size of the enterprises. It is likely that registered enterprises are larger (in terms of turnover, employment, investment) as compared to unregistered enterprises and therefore their demand for credit is also larger.[15]

Further, there is not much difference in the average interest rate between formal and informal sources of credit for the different categories of enterprises. Registered enterprises which have accessed credit from both the sources, paid on an average higher interest rate on informal credit. However, for these enterprises the difference in average interest rate between formal and informal credit is low (0.1%). Similarly, un-registered enterprises which have accessed credit from both the sources, paid higher interest on informal credit. For these enterprises, the

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[13] However, based on a survey across three states in India (Maharashtra, Tamil Nadu and Odisha), ILO (2014) concludes that among the sample enterprises (3029) level of compliance in VAT is much lower than income tax.

[14] Credits from central and state level term lending institutions, government (central, state, local bodies), commercial banks, co-operative banks and societies, micro-finance institutions, and other institutional agencies are considered as formal sector credit and credits from money lenders, business partner(s), suppliers / contractors, friends and relatives, and others are considered as informal sector credit.

[15] Average number of total workers in registered enterprises is 2.1 times higher than unregistered enterprises, average annual turnover for registered enterprises is 3.7 times higher than unregistered enterprises, and average annual investment in registered enterprises is 2 times higher than unregistered enterprises.

difference in average interest rate between formal and informal credit is 0.9 percent. As compared to registered enterprises, a large percentage (41%) of un-registered enterprises drawn credit from informal sources and they paid higher interest rate on informal credit (Table 1).

Table 1: Sources of Credit and VAT registration

Description	Sources of Credit	Registered	Un-registered
No. of Observations	Take Credit Only from Formal Sources	2,237 (68.3)	1,909 (53.2)
	Taken Credit Only from Informal Sources	699 (21.4)	1,463 **(40.8)**
	Taken Credit Both from Formal and Informal Sources	338 (10.3)	213 (5.9)
	Total	3,274	3,585
Average Size of Outstanding Liability (in INR0.1 million)	Formal Only***	9.4	3.4
	Informal Only***	4.5	1.2
	Both***	37.0	8.8
	- Average Share of Formal Sources (%)	*59*	*62*
	- Average Share of Informal Sources (%)	*41*	*38*
Interest rate (% per month)	Formal Only*	1.5	1.6
	Informal Only**	**2.6**	**2.9**
	Both		
	- Formal*	1.8	1.3
	- Informal	1.9	2.2

Note: ***, **, * - imply two sample t-test for mean equality is significant at 0.01, 0.05 and 0.10 level respectively.
Source: Computed by authors based on NSSO (2012a) database

Preliminary analysis therefore does not seem to support the hypothesis that informal sector enterprises face relatively higher costs of credit. This is in contradiction to the findings of the earlier studies (though conducted for Brazilian enterprises) that informal sector has limited access to formal credit and face relatively higher cost of credit (Araujo and Rodrigues Jr. 2016, de Paula and Scheinkman 2011). Results show that interest rates for un-registered enterprises are marginally higher than registered enterprises and the difference is much larger for informal sources of credit as compared to formal sources.

5.2 Informality in Labour Market

The existence of informality in labour market could also influence entrepreneurs' decision to take registration. However, unlike informal credit market where entrepreneurs have limited

capacity to influence terms and conditions of the loans and method/ mode of repayment, entrepreneurs have freedom to set terms and conditions for employment and pay wages and salaries according to their preferred mode of payment, unless there is any specific rule to restrict them under labour laws or any other laws.[16] In the presence of large scale unemployment and under-employment, it is likely that employees cannot influence the decision of the employer on the terms of conditions of employment and therefore employers' (entrepreneurs) decision prevails. It becomes statutory obligation for any business entity to take registration under different Acts - like Factories Act, Provident Fund (PF) Act, Employees' State Insurance (ESI) Act - if number of employees crosses the respective thresholds for registration.[17] By not maintaining employment register and paying wages and salaries in cash, not only can entrepreneurs keep a substantial part of their activities out of books of accounts but also avoid any statutory obligations to provide benefits to employees (e.g., Provident Fund, Employee Insurance). Therefore, it is possible that regulatory aspects of the labour market might encourage informality in labour market which could then spill over to output market in terms of non-registration for tax.

Table 2 shows that percentage share of hired informal workers in total hired workers is similar across enterprises irrespective of their VAT registration status. There is no significant difference in employment pattern in hired workers between registered and unregistered enterprises. Almost one third of unregistered enterprises are run by working owners and by taking help of helpers and other workers. In both for registered and unregistered enterprises, informal workers hold significant share in total hired workers. This shows that existence of informality in labour market does not appear to be a feature specific to un-registered enterprises.

Table 2: Sources of Labour and VAT registration

Description	Registered	Un-registered
Number of Observations		
Hired Formal Workers Only	1,116	1,219
	(11.0)	(9.0)
Hired Informal Workers Only	8,707	12,275
	(85.6)	(90.3)
Hired Formal and Informal Workers	343	103
	(3.4)	(0.8)
Sub-Total – Hired Workers	**10,166**	**13,597**
Other Workers/ Helpers Only	901	2,548
Working Owners Only	662	3,530
Total Workers	**11,729**	**19,675**
Average Number of Workers		

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[16] With effective from 28 December 2016, the Payment of Wages (Amendment) Act 2017 has been enacted to enable the Centre and state governments to specify industrial units which will have to pay wages only through cheques or by transferring money into bank accounts.

[17] For our sample enterprises, correlation coefficient between registration under VAT and under any other Act is found negligible.

Description	Registered	Un-registered
Hired Formal Workers Only***	5.9	2.9
Hired Informal Workers Only***	7.0	3.5
Hired Formal and Informal Workers***	26.5	12.2
*Formal Hired Workers****	*7.1*	*4.4*
*Informal Hired Workers****	*19.4*	*7.8*
Hired Workers - Total**	**7.6**	**3.5**
Other Workers/ Helpers Only***	1.3	1.2
Working Owners Only***	1.12	1.08
Total Workers**	**8.1**	**3.8**
Average of Hired Workers as Percentage of Total Workers (%)***	65.9	60.9
Average of Informal Hired Workers as Percentage of Total Hired Workers (%)***	98.4	99.6
Average Informal Workers as Percentage of Total Workers (%)	50.0	38.3

Note: ***, **, * - imply two sample t-test for mean equality is significant at 0.01, 0.05 and 0.10 level respectively.
Figure in the parenthesis shows the percentage share in total hired workers.
Source: Computed by authors based on NSSO (2012a) database

5.3 Capital, Investment and Productivity

Market value of assets (excluding land and buildings) is a measure of size of an enterprise as well as capital base.[18] Higher the value of assets implies higher the size. Table 3 shows that average market value of asset per worker (also known as capital – labour ratio) is significantly higher for registered enterprises as compared to unregistered enterprises. The finding supports the argument that informal sector is less capital intensive as compared to formal sector (de Paula and Scheinkman 2011). Registered enterprises have higher turnover per worker as compared to unregistered enterprises. It implies that, labour productivity in formal sector is higher than informal sector, and it supports the existing literature (de Paula and Scheinkman 2011, Araujo and Rodrigues 2016, IMF 2017). Average annual turnover per INR of market value of total asset (also known as capital productivity) is higher for registered enterprises as compared to unregistered enterprises. This shows that average capital productivity of formal enterprises is higher than informal enterprises and it supports the existing literature. Registered enterprises have significantly higher market value of total asset as compared to unregistered enterprises. Predominantly enterprises use their own asset. However, some enterprises also hire asset on rent. Average market value of hired asset is higher for registered enterprises as compared to unregistered enterprises. Irrespective of registration status, monthly interest on hired asset is high and there is no significant difference in average monthly rent on hired asset between registered and unregistered enterprises. Average annual investment in registered enterprises is twice that in

[18] Assets constitute of plant and machinery, transport equipment, tools and other fixed assets, software and database, information, computer and telecommunications equipment, and capital work in progress. Land and building is not included in the asset base.

unregistered enterprises. The analysis shows that market value of asset is an alternative measure of the size of economic activities and registered enterprises have larger asset base as compared to unregistered enterprises, productivity of labour and capital is higher for formal enterprises as compared to informal enterprises, and also registered enterprises invest more on yearly basis as compared to their unregistered counterpart.

Table 3: Asset, Labour and Capital

Description	Registered	Un-registered
Average Market Value of Total Asset per Worker (INR)(Capital – Labour Ratio)***	50,545	29,830
Average Annual Turnover per Worker (INR)(Output per Worker)***	153,868	108,927
Average Annual Turnover per INR of Market Value of Total Asset (INR)** (Output per unit of Capital)	10,029	1,180
Gross Value Added per INR of Annual Turnover (INR)***	0.19	0.23
Gross Value Added per Worker (INR)***	31,293	26,527
Gross Value Added per INR of Market Value of Total Asset (INR)*	12.5	14.2
Average Market Value of Total Asset (INR)**	146,902	114,563
*Average Market Value of Own Asset (INR)**	*143,998*	*113,358*
Average Market Value of Hired Asset (INR)	*177,281*	*111,647*
Average Per Month Rent on Hired Asset (%)	8.8	8.1
Average Annual Investment (INR)***	85,538	41,132
Average Annual Turnover per INR of Annual Investment (INR)	11,807	8,098

Note: ***, **, * - imply two sample t-test for mean equality is significant at 0.01, 0.05 and 0.10 level respectively.
Source: Computed by authors based on NSSO (2012a) database

Data shows that for registered enterprises capital-labour ratio is 1.7 times higher than unregistered enterprises. For registered enterprises output per worker is 1.4 times higher than unregistered enterprises. This implies that productivity of labour is higher for registered enterprises. Output per unit of capital is 8.5 times higher for registered enterprises as compared to unregistered enterprises. Therefore, both labour and capital productivities for registered enterprises are higher than unregistered enterprises.

GVA per worker for registered enterprises is 1.2 times higher than unregistered enterprises. However, GVA per INR of capital asset is higher for unregistered enterprises as compared to registered enterprises. It shows that capital asset in unregistered enterprises add larger value than registered enterprises. GVA per INR of turnover is also higher for unregistered enterprises. In other words, unregistered enterprises have larger value addition per unit of output or turnover.

Average size of capital asset for registered enterprises is 1.3 times higher than unregistered enterprises. For registered enterprises hired asset is 1.6 times higher than unregistered enterprises. There is no difference in the average rent charged for hired asset across groups of enterprises. Therefore, presence of informality in asset market may not be a factor influencing entrepreneurs' decision to take VAT registration.

Average annual investment is 2.1 times higher for registered enterprises when compared to unregistered enterprises. Average annual turnover per INR of annual investment is 1.5 times higher for registered enterprises as compared to unregistered enterprises. This implies that registered enterprises make larger annual investment, their productivity is not consistently higher.

5.4 MSME Regulation and Informality

To test the VAT registration status of enterprises as per the categorisation under the MSMED Act, we restrict our sample to only manufacturing enterprises (in addition to other restrictions) and consider only market value of own asset (excluding land and buildings).Results presented in Table 4 show that as asset base increases, VAT registration increases. However, the phenomenon fails for 'Medium Enterprises', as their VAT registration status is not as good as other two categories.

Table 4: MSME Regulation and VAT Registration

Category of Enterprises	No. of Sample Enterprises	Percentage of Enterprises Registered under VAT Act
Micro Enterprise	16113	19.05
Small Enterprise	81	51.85
Medium Enterprise	7	28.57
All	16201	19.22

Source: Computed by authors based on NSSO (2012a) database

5.5 Self-policing of VAT and registration

Self-enforcing (or self-policing) nature of VAT system is often cited as an inherent driver for encouraging formalisation of enterprises (Pomeranz, 2015). However, a careful look shows that VAT itself may not be adequate for all businesses to take part in the tax system. Businesses having low value addition (implies higher input costs) and strong forward linkages will find it incentive compatible to take VAT registration, as they will have low output tax liability, potentially high input tax credit and peer pressure from downstream business to take part in the tax system. Similarly, businesses having higher share of output being sold to final consumers,

might not face the same incentives as they are not part of a supply chain which requires flow of input tax credit.

In another study using the same database, Mukherjee and Rao (2015) shows that if firms are classified into manufacturing and trading firms, the former have a higher ratio of gross value added to total turnover. This would mean that for a given output tax liability, manufacturing firms would have lower input tax credit claims when compared to trading firms. The self-policing nature of VAT is relatively weak if ITC claims are small.

The above analysis shows that there are several pull (e.g., productivity gain, lower interest on credit) as well as push (e.g., annual turnover, total workers, size of capital asset, annual investment) factors which may drive the decision of the entrepreneurs to take VAT registration. Enterprise specific factors (e.g., visibility - location of the business, place of business, type of ownership, year of operation, activities – manufacturing or trading, ratio of value addition in turnover) may influence decision of the entrepreneurs. Moreover, entrepreneur specific factors (e.g., age, level of education, socio-economic status) may influence their decision to take VAT registration. However, NSSO survey does not capture such information as respondent may not necessarily be the owner of the business. In addition, there are state specific factors (e.g., efficiency in tax administration, enforcement of tax rules and regulation, tax morale) which may influence the decision of entrepreneurs to take VAT registration.

Using these different factors, in the following section, an attempt is made to use a multivariate approach to understand which of these factors appear to influence the decision of enterprises to register under VAT.

6. Multivariate Analysis

We use a bivariate heteroskedastic probit model for estimation of response probabilities for registration of enterprises under state Value Added Tax (VAT)/ sales tax act (*regvatact*).[19] 'hetprobit' fits a maximum-likelihood probit model and it is a generalisation of the probit model. The estimated model and variables are described below.

y_i, i=1,…, n, is a binary outcome variable taking on the value 1 (success) or 0 (failure). In the probit model, probability that y_i takes on the value 1 is modeled as a nonlinear function of a liner combination of the k independent variable $x_i = (x_1, x_2, …, x_k)$,

$$\Pr(y_i = 1|x) = \Phi(x_i'\beta)$$

Where, β is constant k – dimensional vector and $\Phi()$ is a standard normal cumulative distribution function with variance one.

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[19] We have used Stata (Version 13.1) command 'hetprobit' for estimating the probit model.

Heteroskedastic probit generalises the probit model by assuming $\Phi()$ to be a normal cumulative distribution function with a variance (σ^2) that is a function of independent variables. Following Harvey (1976), 'hetprobit' models the variance as a multiplicative function of m variables $z_i=(z_1, z_2, \ldots, z_m)$ with n observations each.

$$\sigma_i^2 = \{\exp(z_i'\gamma)\}^2$$

Therefore, the probability of success as function of all independent variables is

$$Pr(y_i = 1|x,z) = \Phi(\frac{x_i'\beta}{\exp(z_i'\gamma)}) \qquad (1)$$

For identification of the model (1), unlike in the index $x_i'\beta$, no constant term can be present in $z_i'\gamma$.

For convenience, let y be the n x 1 vector of all observations of y_i, let X be the n x k matrix whose ith row is x_i' and let Z be the n x m matrix with ith row of z_i'. Then the log likelihood function can be written as

$$lnL(\beta,\gamma|y,X,Z) = \sum_{i=1}^{n}(y_i ln\Phi\left(\frac{x_i'\beta}{\exp(z_i'\gamma)}\right) + (1-y_i)ln(1-\Phi(\frac{x_i'\beta}{\exp(z_i'\gamma)}))$$

Given a set of n observed values of the random vectors y, x, z, in order to obtain the maximum likelihood estimate, one maximises this function over the space of possible choices of $(\beta,\gamma) \in R^{k+m}$.

Using this methodology, we run the following binary choice heteroskedastic probit model:

$$Pr(regvatact = 1|x,z) = \Phi\left(\frac{x_i'\beta}{\exp(z_i'\gamma)}\right) \qquad (2)$$

Model 1 Specification:

$x'\beta = \beta_0 + \beta_1 lturnover + \beta_2 ltotalworker + \beta_3 lyearoop + \beta_4 locationout * urban + \beta_5 govtassist + \beta_7 mfg + \beta_7 prop * oae + \beta_8 state\ dummies$

$z'\gamma = \gamma_0 lturnover + \gamma_1 ltotalworker$

Model 2 Specification:

$x'\beta =$
$\beta_0 + \beta_1 ltotalworker + \beta_2 lmktvaltotasst + \beta_3 ltotalcredit + \beta_4 creditformal +$

$$\beta_5 gvaturnover + \beta_6 lyearoop + \beta_7 locationout * urban + \beta_8 govtassist +$$
$$\beta_9 mfg + \beta_{10} prop * oae + \beta_{11} state\ dummies$$

$$z'\gamma = \gamma_0 ltotalworker$$

Dependent Variable:

regvatact = 1 if the enterprise registered under VAT/Sales Tax Act, 0 if not.

Scale Indicators (Push factors):

lturnover – log of annual receipts/ turnover (in INR)

ltotworker – log of total worker (full time and part time, male and female)

lmktvaltotasst – log of market value of total (own and hired) asset (other than land and building) (in INR)

ltotalcredit – log of total outstanding loan from all sources (in INR)

Pull factors

creditformal – 1 if there is outstanding loan from formal sources, 0 otherwise

Enterprise Specific factors

gvaturnover   - ratio of Annual Gross Value Added and Turnover

lyearoop – log of year of operation (as on 2011)

locationout = 1 if location of the enterprise outside the household premises (permanent location), 0 otherwise

govtassist = 1 if the enterprise received government assistance, 0 otherwise.[20]

mfg – 1 if the enterprise is engaged in manufacturing only, 0 otherwise

urban – 1 if the enterprise is located in urban area, 0 otherwise

prop – 1 if Proprietary Enterprises, 0 otherwise

oae – 1 if the enterprise is Own Account Enterprise, 0 otherwise[21]

State Specific factors

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[20] Assistances received from the government include financial loan, subsidy, machinery/ equipment, training, marketing, raw material, and others.

[21] Enterprises are classified into two categories - Own Account Enterprise (OAE) and Establishment. OAE is an enterprise which is run by members of the household without hiring any worker on a fairly regular basis. Establishment is run by employing at least one hired worker on a fairly regular.

State Dummy – 1 for the Concerned State, 0 otherwise[22]

Basic statistics for the data used is summarised in Table A3 in Appendix. The results of the estimation exercise are presented in Table 5.

The results show that all the scale variables influence entrepreneurs' decision to take VAT registration positively and significantly. The results are as per our expectation, as an enterprise grows, it aspires to get integrated with larger chain of economic activities and therefore taking VAT registration enables them to pass on the input taxes to next level of economic agents. Access to credit from formal sources (*creditformal)* on the other hand, works as incentive (pull factor) factors which induces entrepreneurs to take VAT registration. In other words, while access to formal sector credit does not appear to be the sole determinant of the decision to remain informal or become formal, at the margin, it does seem to play a role in encouraging registration for VAT.

Turning to enterprise specific factors, the results show that relatively old enterprises (operating for longer periods), enterprises located outside the household premises in urban areas, and those that received assistance from government are more likely to take VAT registration. On the other hand, enterprises having higher ratio of GVA in turnover (*gvaturnover)*, engaged in manufacturing and own account proprietary enterprises are relatively less likely to take VAT registration. Enterprises having higher *gvaturnover* will face larger tax burden on output as compared to input tax credit available as credit, therefore they might be relatively reluctant to take registration under VAT.

To capture state specific factors, we have used state dummies where we have taken Karnataka as a base state. The results show that, as compared to enterprises located in Karnataka, enterprises located in Himachal Pradesh, Haryana, Delhi, Uttar Pradesh and Bihar are more likely to take VAT registration. Similarly, enterprises located in Jammu & Kashmir, Uttarakhand, Assam, West Bengal, Chhattisgarh, Maharashtra, Andhra Pradesh, Kerala and Tamil Nadu are less likely to take VAT registration. With reference to enterprises located in Karnataka, enterprises located in Punjab, Rajasthan, Odisha, Madhya Pradesh and Gujarat are equally likely to take VAT registration.

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[22]We have considered only Non Special Category States and States having observations above 100.

Table 5: Regression Results

Variable Name	Model 1 Coeff.		S.E.	M.E.	Model 2 Coeff.		S.E.	M.E.
lturnover	1.670	***	0.244	0.192				
ltotalworker	0.992	***	0.156	0.118	0.493	***	0.043	0.171
lmktvaltotasst					0.018	*	0.010	0.006
ltotalcredit					0.317	***	0.022	0.109
creditformal					0.155	***	0.05	0.053
gvaturnover					-1.195	***	0.137	-0.41
lyearoop	0.104	***	0.035	0.011	0.092	***	0.023	0.031
locationout*urban	0.506	***	0.093	0.055	0.227	***	0.043	0.078
govtassist	0.758	***	0.195	0.085	-0.062		0.062	-0.021
mfg	-1.271	***	0.190	-0.134	-0.510	***	0.057	-0.173
prop*oae	-0.360	***	0.098	-0.039	-0.157	**	0.062	-0.054
Jammu & Kashmir	-0.930	***	0.214	-0.096	-0.688	***	0.119	-0.223
Himachal Pradesh	1.614	***	0.313	0.183	0.461	***	0.133	0.156
Punjab	0.313		0.193	0.035	-0.009		0.127	-0.003
Uttarakhand	-1.083	***	0.264	-0.110	-0.602	***	0.175	-0.196
Haryana	1.180	***	0.266	0.133	0.573	***	0.135	0.192
Delhi	1.322	***	0.281	0.149	0.507	***	0.175	0.17
Rajasthan	0.012		0.181	0.001	-0.142		0.132	-0.049
Uttar Pradesh	1.370	***	0.253	0.154	0.624	***	0.123	0.208
Bihar	1.011	***	0.263	0.114	0.542	**	0.217	0.181
Assam	-1.816	***	0.320	-0.175	-0.318	*	0.191	-0.107
West Bengal	-2.217	***	0.338	-0.216	-0.726	***	0.096	-0.237
Odisha	0.558	*	0.290	0.062	0.126		0.166	0.043
Chhattisgarh	-1.370	***	0.321	-0.136	-0.082		0.243	-0.028
Madhya Pradesh	-0.201		0.167	-0.022	0.052		0.169	0.018
Gujarat	0.114		0.162	0.012	-0.124		0.105	-0.042
Maharashtra	-1.269	***	0.241	-0.129	-0.467	***	0.099	-0.156
Andhra Pradesh	-0.921	***	0.202	-0.096	-0.229	**	0.091	-0.078
Kerala	-1.253	***	0.251	-0.127	-0.379	***	0.093	-0.128
Tamil Nadu	-1.605	***	0.282	-0.159	-0.467	***	0.094	-0.156
Constant	-25.859	***	3.774		-4.477	***	0.287	
lturnover	0.080	***	0.010					
ltotalworker	0.081	***	0.017		0.102	***	0.026	
Number of observations	31,321				6,733			
Odd Ratio	0.595				0.914			
LR chi2	4404.52	***	df: 26		1858.5	***	df: 29	
Log likelihood	-16322.2				-3559.0			
Pseudo R2	0.368				0.484			
chi2 for Ho:lnsigma2=0	172.33	***	df: 2		15.69	***	df: 1	

Notes: ***, **, & * imply estimated z-statistic is significant at 0.01, 0.05 and 0.10 level respectively.

S.E. – Standard Error, M.E. - Marginal effect

7. Conclusions

Two interesting results come out from this study – first, on average, unregistered enterprises face higher cost of capital from informal sources of credits. This could be understood as follows: higher cost of capital could imply economic viability of the enterprise is lower and hence the entrepreneur would have less interest in being registered for tax purposes. Further, higher cost of capital is perhaps associated with borrowing from informal sources. Interest payments on such borrowing might have to be paid in cash requiring the need to keep transactions out of the books of accounts.[23] If this direction of causation in decision making is valid, it would suggest that increasing access to formal sources of credit can provide a windfall benefit to governments in the form of higher tax registration and perhaps a resultant increase in tax collections.

Second, increase in assistance from government is associated with higher probability of registration with VAT departments. This result too supports greater intervention by the government in supporting unincorporated units, even from a tax department perspective.

A counter-intuitive result however is that the coefficient of the dummy for manufacturing is negative in regression models – it suggests that all other things remaining the same, the probability of a manufacturing unit being registered for VAT/sales tax is lower than that of a trading firm. This result is apparently counterintuitive since as compared to enterprises engaged in trading, manufacturing units face lower VAT registration threshold. This result suggests two things – one, it is possible that manufacturers are small units not part of supply chain with their own marketing systems. Since they are not integrated with the rest of the economy, they may not perceive any merit in registering for VAT. Second, the fact that manufacturing units are less likely to register suggests that the tax departments are unable to monitor the economic activity being undertaken in their jurisdiction.

Depending on respective turnover based threshold set for VAT registration by State Governments, different State tax administration face different level of challenges of bringing unincorporated enterprises under the tax system. To integrate the unincorporated enterprises with the rest of the economy, it is imperative to bring the enterprises under the tax system. For enterprises, while it is often argued that there are costs associated with remaining outside the tax system, since a number of firms are choosing to remain outside the tax system, it appears that the

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[23] It is also possible that firms which choose not to be part of the formal economy prefer to access informal sources of credit. In such cases, the decision not to register with the tax department would precede the sourcing of credit. One such case could be where the activity of the enterprise is very volatile – such an activity may not benefit from formalisation. A quick analysis to check this hypothesis however did not reveal any results – number of months of operation was used as an indicator of volatility of the business. There is no difference between registered and unregistered firms in the average number of months of operation.

self-policing (or self-enforcing) dimension of the VAT regime does not provide adequate benefits (Keen and Smith 2006). Even the presently existing tax compounding schemes do not seem to be attractive enough to bring the small dealers into the system. It is therefore important to explore alternative measures which could change this scenario on the ground. From the results in the present study, it appears that facilitating access to formal sector credit might be one such instrument. The other can be a focus on expanding the consumer's incentives to ask for an invoice. If larger segments of the economy ask for invoices for the purchases made, the incentive and the option to remain out of the tax regime would be correspondingly reduced.

Location of the enterprises also plays an important role to get registered with State sales tax authority. Enterprises which are located outside the households (in fixed premises) and urban areas are easy to identify and could potentially attract inspection from State tax administration and therefore they should be more likely to take registration. Our data analysis shows that even in this category not all enterprises are registered. It throws up question on efficiency of State tax administration. An efficient tax administration could potentially look for opportunities to expand the tax base by bringing more assessees under the tax net.

It is not expected that mere registration with state tax authority would result in sudden substantial tax revenue mobilisation for states, but gradual increase in registration with tax authority would result in integration of unincorporated enterprises with integrated supply chains of formal economy. In the long run, it is hoped that enterprises will reap the benefits of economic integration through backward and forward linkages and for tax administration, they will get a cleaner system to deal with. Apart from interventions like improved access to formal sector credit and incentives from governments, tax departments also conduct regular surveys to identify errant taxpayers. This activity however is low on the list of priorities of the tax departments, working with limited manpower. In the GST regime, it is not clear which agency would take on this vital responsibility.

Table A1: VAT Threshold in Selected States in India

State	VAT Registration Threshold (INR0.1 million)		Average Per capita GSDP (INR): 2009-10 to 2011-12	Per Capita Income Category**
	Manufacturer	Trader		
Andhra Pradesh	7.5	7.5	42,215	LMIS
Assam	6	6	24,114	LIS
Bihar*	5	5	13,258	LIS
Chhattisgarh*	2	10	31,130	LMIS
Delhi	10	10	108,159	HIS
Gujarat	2	5	62,075	HIS
Haryana	5	5	65,015	HIS
Himachal Pradesh	4	6	57,334	UMIS
Jammu & Kashmir	0	0	33,069	LMIS
Karnataka*	**7.5**	**7.5**	**45,227**	**UMIS**
Kerala*	10	10	56,819	UMIS
Madhya Pradesh*	5	5	25,035	LIS
Maharashtra	10	10	64,963	HIS
Orissa	10	10	29,670	LIS
Punjab	1	5	50,896	UMIS
Rajasthan	5	10	31,140	LMIS
Tamil Nadu	10	10	59,107	HIS
Uttar Pradesh	5	5	19,756	LIS
Uttarakhand*	5	5	56,323	UMIS
West Bengal	5	5	34,543	LMIS
Minimum			*13,258*	
Quartile 1			*30,765*	
Quartile 2 (median)			***43,721***	
Quartile 3			*57,778*	
Maximum			*108,159*	

Note: *-Threshold Limit is taken from the data shared by the VATInfoline.com (personal communication). For others it is based on personal communication to the respective State Commercial taxes Department.

**- Low Income State (LIS): PCGSDP <Quartile 1, Lower Middle Income State (LMIS): Quartile 1> PCGSDP< Quartile 2, upper Middle Income State (UMIS): Quartile 2< PCGSDP< Quartile 3, High Income State (HIS): PCGSDP > Quartile 3.

Source: Personal Communication

Table A2: Selected State-wise VAT Registration Status of Sample Enterprises

State	No. of Enterprises having Annual Turnover above VAT Registration Threshold							No. of Enterprises having Annual Turnover below VAT Registration Threshold							
	Registered		Unregistered		No Response		Total	Registered		Unregistered		No Response		Total		
Jammu & Kashmir	233	**(6.3)**	1548	(41.8)	1918	(51.9)	3699	0	(0.0)	3	(100)	0	(0.0)	3		
Himachal Pradesh	411	**(48.4)**	321	(37.8)	117	(13.8)	849	91	**(4.4)**	803	(39.2)	1154	(56.3)	2048		
Punjab	474	(16.0)	846	(28.6)	1638	(55.4)	2958	51	(1.6)	572	(18.4)	2490	(80.0)	3113		
Uttarakhand	186	(19.5)	574	(60.2)	193	(20.3)	953	29	(1.1)	1054	(40.9)	1493	(58.0)	2576		
Haryana	543	(28.4)	331	(17.3)	1038	(54.3)	1912	55	(1.4)	276	(7.0)	3610	(91.6)	3941		
Delhi	573	(35.3)	266	(16.4)	786	(48.4)	1625	114	(3.3)	381	(10.9)	3012	(85.9)	3507		
Rajasthan	616	(29.8)	604	(29.2)	846	(40.9)	2066	153	(2.2)	831	(12.0)	5968	(85.8)	6952		
Uttar Pradesh	1385	(33.6)	973	(23.6)	1760	(42.7)	4118	276	(1.6)	1386	(8.0)	15720	(90.4)	17382		
Bihar	310	(13.6)	307	(13.5)	1656	(72.9)	2273	49	(0.7)	204	(3.1)	6394	(96.2)	6647		
Assam	231	(13.9)	880	(52.9)	551	(33.2)	1662	61	(1.4)	1285	(29.3)	3034	(69.3)	4380		
West Bengal	928	(15.9)	3850	(66.0)	1056	(18.1)	5834	101	(0.8)	4218	(33.9)	8127	(65.3)	12446		
Odisha	219	(29.3)	142	(19.0)	386	(51.7)	747	80	(1.2)	440	(6.6)	6194	(92.3)	6714		
Chhattisgarh	131	(20.7)	352	(55.7)	149	(23.6)	632	36	(1.2)	746	(24.7)	2236	(74.1)	3018		
Madhya Pradesh	634	(25.5)	1079	(43.5)	770	(31.0)	2483	88	(0.8)	1855	(17.8)	8495	(81.4)	10438		
Gujarat	861	(25.8)	1288	(38.6)	1191	(35.7)	3340	68	(1.1)	1015	(16.8)	4957	(82.1)	6040		
Maharashtra	888	(34.7)	1451	(56.8)	217	(8.5)	2556	267	(2.3)	4476	(38.1)	7007	(59.6)	11750		
Andhra Pradesh	943	(29.1)	1523	(47.1)	769	(23.8)	3235	204	(1.4)	3287	(22.1)	11393	(76.5)	14884		
Karnataka	669	(39.2)	770	(45.2)	266	(15.6)	1705	165	(2.4)	2135	(31.4)	4498	(66.2)	6798		
Kerala	615	(33.2)	1043	(56.2)	197	(10.6)	1855	196	(2.3)	4020	(48.0)	4152	(49.6)	8368		
Tamil Nadu	879	(29.0)	1527	(50.5)	620	(20.5)	3026	237	(1.6)	4904	(33.7)	9397	(64.6)	14538		
Total	**11729**	**(24.7)**	**19675**	**(41.4)**	**16124**	**(33.9)**	**47528**	**2321**	**(1.6)**	**33891**	**(23.3)**	**109331**	**(75.1)**	**145543**		

Source: Computed by authors from NSSO (2012a) database

Table A3: Basic Statistics

Variable	Mean	Std. Dev	Min	Max
Whether the enterprise is registered under VAT/ Sales Tax Act? (*regvatact*, yes=1, 0 = No)	0.37	0.48	0	1
Years of operation as on 2011 since the year of initial operation (*yearoop*) (Years)	12.30	10.62	0	152
Whether the enterprises located outside the household premises? (*locationout*, 1=yes, 0=no)	0.79	0.41	0	1
Whether the enterprise is located in an urban area? (urban, 1=yes, 0=rural)	0.65	0.48	0	1
*locationout*urban*	0.54	0.50	0	1
Whether the enterprise has received any government assistance? (govtassist, 1=yes, 0=no)	0.02	0.16	0	1
Whether the enterprise is engaged in manufacturing? (mfg, 1=yes, 0=no)	0.35	0.48	0	1
Whether the enterprise is a proprietary? (prop, 1=yes, 0=no)	0.94	0.24	0	1
Whether the enterprise was an Own Account Enterprise (OAE) during the last 365 days? (*oae*, 1=yes, 0=no)	0.34	0.47	0	1
*prop*oae*	0.33	0.47	0	1
Total Number of Workers (all types, including working owner) (*totalworker*) (Nos.)	4.83	12.41	1	602
Ratio of Annual Gross Value Added and Annual Turnover (*gvaturnover*)	0.24	0.21	0.001	3.24
Whether the enterprise has outstanding loan from formal sources of credit? (*crditformal*, 1=yes, 0=no)	0.62	0.49	0	1
Annual turnover (*turnover*, in INR million)[a]	3.92	42.40	0.002	6,480.0
Market value of total asset (*mktvaltotasst*, in INR million)	0.12	1.05	0.00	101.0
Total Outstanding Loan (both from formal and informal sources) (*totalcredit,* in INR million)	0.57	2.64	0.00	127.0

Note: For Jammu & Kashmir, registration threshold is zero.
Source: Computed by authors from NSSO (2012a) database.

References

Araujo, Julia P. and Mauro Rodrigues (2016), "Taxation, credit constraints and the informal economy", *EconomiA*, 17(1): 43–55.

Boadway, Robin and Motohiro Sato (2009), "Optimal Tax Design and Enforcement with an Informal Sector", *American Economic Journal: Economic Policy*, 1(1): 1-27.

Demenet, A., M. Razafindrakoto and F. Roubaud (2016), "Do Informal Businesses Gain From Registration and How? Panel Data Evidence from Vietnam", *World Development*, 84(August 2016): 326-341.

de Paula, Áureo and Jose A. Scheinkman (2011), "The Informal Sector: An Equilibrium Model and Some Empirical Evidence from Brazil", *Review of Income and Wealth*, 57(s1): S8-S26.

de Paula, Áureo and Jose A. Scheinkman (2010), "Value-Added Taxes, Chain Effects, and Informality", *American Economic Journal: Macroeconomics*, 2(4):195-221.

Emran, Shahe M. and Joseph E. Stiglitz (2005), "On selective indirect tax reform in developing countries", *Journal of Public Economics,* 89(4): 599–623.

Harvey, Andrew (1976), "Estimating Regression Models with Multiplicative Heteroscedasticity", *Econometrica*, 44(3): 461-65.

Hofmann, E., E. Hoelzl and E. Kirchler (2014), "Preconditions of Voluntary Tax Compliance: Knowledge and Evaluation of Taxation, Norms, fairness, and Motivation to Cooperate", *Z Psychol. (Journal of Psychology),* 216(4): 209-217.

International Labour Organization (ILO) (2014), "Labour Laws and Growth of Micro and Small Enterprises: India - Country Report", ILO DWT for South Asia and Country Office for India, New Delhi.

International Labour Organization (ILO) (2013), "Measuring Informality: A Statistical Manual on the Informal Sector and Informal Employment", ILO: Geneva.

International Monetary Fund (IMF) (2017), "IMF Fiscal Monitor: Achieving More with Less - Chapter 2 Upgrading the Tax System to Boost Productivity", IMF Washington, D.C.

Joshi, Anuradha, Wilson Prichard and Christopher Heady (2014), "Taxing the Informal Economy: The Current State of Knowledge and Agendas for Future Research", *Journal of Development Studies*, 50(10): 1325-1347.

Kanbur, Ravi and Michael Keen (2015), "Reducing Informality", *Finance & Development* (March 2015), 52-54.

Kanbur, Ravi, and Michael Keen (2014), "Thresholds, Informality and Partitions of Compliance," *International Tax and Public Finance*, 21(4): 536–559.

Keen, Michael and Stephen Smith (2006), "VAT Fraud and Evasion: What Do We Know and What Can Be Done?", *National Tax Journal*, 59(4): 861-887.

Keen, Michael and Jack Mintz (2004), "The optimal threshold for a value-added tax", *Journal of Public Economics*, 88(3-4): 559-576.

Keen, Michael (2008), "VAT, tariffs, and withholding: Border taxes and informality in developing countries", *Journal of Public Economics*, 92(10–11): 1892–1906.

McKenzie, D. and Y.S. Sakho (2010), "Does it pay firms to register for taxes? The impact of formality on firm profitability", *Journal of Development Economics*, 91(1): 15-24.

Mukherjee, S. and R. Kavita Rao (2015), "*Factors Influencing Unincorporated Enterprises to Register under Value Added Tax (VAT): An Analysis with Enterprises Survey Data*", Working Paper No. 145, National Institute of Public Finance and Policy (NIPFP), New Delhi.

National Sample Survey Office (NSSO) (2012a), "Unit Level Data of Unincorporated Non-agricultural Enterprises (Excluding Construction) in India", NSS 67th Round (June 2010 - July 2011), NSSO, Ministry of Statistics and Programme Implementation, Government of India, New Delhi.

National Sample Survey Office (NSSO) (2012b), "*Operational Characteristics of Unincorporated Non-agricultural Enterprises (Excluding Construction) in India*", NSS 67th Round (June 2010 - July 2011), Report No. 546 (67/2.34/1), NSSO, Ministry of Statistics and Programme Implementation, Government of India, New Delhi.

Piggott, John and John Whalley (2001), "VAT base broadening, self supply, and the informal sector", *American Economic Review,* 91(4): 1084–1094.

Pomeranz, Dina (2015), "No Taxation without Information: Deterrence and Self-Enforcement in the Value Added Tax", *American Economic Review*, 105(8): 2539-69.

Tumen, Semih (2017), "Entrepreneurship in the shadows: Wealth constraints and government policy", *Economics of Transition*, 25(2): 239–269.