# Small-Business Participation in the Informal Sector of an Emerging Economy

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## Abstract

Using the case study of Trinidad and Tobago, we investigate the socio-economic, demographic, and attitudinal characteristics of the owners of small businesses who participate in the informal sector of an emerging economy and their perception of the risk of detection by tax authorities while doing so. Data are gathered from a cross-sectional field survey covering 1027 small businesses. Results using multinomial logit and ordered probit models suggest that small-business owners are motivated to participate in the informal sector when, among other things, they believe that the risk of detection by the tax authorities is low and that government regulations are burdensome, but there is no evidence that the tax rate itself is an issue. Their perception of the risk of detection by the tax authority is determined largely by the time they spend and the income they earn in the formal sector as well as by other socio-economic and demographic indicators such as sex, the area in which they live and the conditions under which they occupy their dwelling.

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## 1. Introduction

The term 'informal sector' is used in this paper to refer to "market-based production of goods and services, whether legal or illegal, that escapes detection in the official estimates of GDP" (Smith 1994, p. 18)[1]. The total economy is divided into two sectors: the *informal* and *formal*[2]. Much of this unreported income of the informal sector is as a result of a deliberate attempt to evade taxes: indeed, in the literature, the non-reporting of income and tax evasion are almost synonymous (Gërxhani 2003). The most recent studies (see for example Schneider 2005) show that the informal sector in developing countries ranges in size from 20% to 70% of Gross Domestic Product (GDP). Additionally, there is empirical evidence that informal sectors worldwide has been growing in recent decades (Gerxhani 2002, 2003). There are two viewpoints with respect to the informal sector. The traditional view considers the informal sector as a source of income for the poor, and also associates it with unproductive and excluded workers (Tokman 1992). A more recent view is that the informal sector has the potential to achieve high levels of productivity through the dynamic, entrepreneurial character of the micro-enterprises which compose this sector (Portes and Schauffler 1993). Associated with this view are the studies that suggest that the informal sector is not just a survival mechanism for the poor, but a means by which educated and skilled individuals evade income taxes. For instance, in his examination of the informal sector in Poland, Bedi (1998) finds that workers in the public sector, who are highly educated, are more prone to participate in the informal sector. What really goes

[1] This is similar to the definition of Rampersad (1987) who, in a study of Trinidad and Tobago, defines the informal sector as that section of the economy which is: (a) not recorded in the official statistics, (b) not legal, and (c) not taxed. She further sub-divides the sector into a 'visible' informal sector, an 'invisible' informal sector (that part of the informal sector which covers illicit and socially disvalued activities) and a domestic sector

[2] Various labels have been used to describe what, in this paper, we call the informal sector: the informal economy (Kim 2005), the hidden economy (Maurin et al 2006), the subterranean economy (Gutmann, 1977), the shadow economy (Schneider 2005), the black economy (Pissarides and Weber, 1989) and many others.

on in any particular economy is clearly an empirical question and it is necessary to investigate the structure and characteristics of such an economy.

The purpose of this study is, first, to ascertain the socio-economic, demographic and attitudinal characteristics of the small-business owner who decides to participate in the informal sector. Second, we investigate whether and to what extent some of these same elements play a role in affecting a person's perception of the risk of detection by tax authorities of involvement in informal sector activity. To achieve these objectives, data are collected from a survey of small firms[3] in Trinidad and Tobago. The persons who own these businesses are the respondents to the questionnaire. The direct survey method is used in this study because it provides the information required to achieve the objectives, unlike the indirect methods which use time series data, for example the currency demand models[4].

This study differs from other studies done on the informal sector for several reasons. First, it uses data collected at the micro level from a survey of small businesses in Trinidad and Tobago. No other study of this type has been done in Trinidad and Tobago[5]. This study is comparable to the micro-study by Lloyd-Evans and Potter (2002), which focuses on certain occupations and on small geographical areas. However, such a study cannot yield samples which can be used to make general conclusions about participation in the informal sector of Trinidad and Tobago. The questionnaire used in this study was specially prepared to obtain information from participants in the informal sector. It was therefore strong on assuring the anonymity of the respondents and ensuring that the data requested for all of the potentially

[3] The Central Statistical Office of Trinidad and Tobago defines a small enterprise as one that employs five or less persons.

[4] Maurin et al. (2006) use the currency demand model to estimate the size of the informal sector in Trinidad and Tobago for the period 1973-1999.

[5] Other studies carried out on Trinidad and Tobago include Rampersad (1987), Lloyd-Evans and Potter (2002) and Maurin et al (2006).

sensitive questions (age, income earned etc) were categorized, thus increasing the probability of a truthful response. The current study may also be compared with studies of emerging economies which employ macroeconomic (time series) data and methods to estimate the size of the informal sector (Maurin et al. 2006). However, studies which use macro level data cannot give details about the characteristics of the participants as is done here.

A second distinctive feature of this study is that it employs a multinomial logit model to investigate the level of participation by business owners in informal sector activity, using as 'explanatory' variables a host of socio-economic, demographic and attitudinal attributes. Modeling the decision to participate in such activity in this way is new to the literature. Studies which investigate the informal sector through the direct survey method have generally modeled the participation decision using binomial logit (Schneider et al. 2001), probit (Kim 2005) specifications and ordered probit specification (Schneider and Savasan 2005). In the few studies that employ the multinomial logit (Hill 1983 and Neitzert 1998) the choices are generally classified as 'no employment', 'employment in the formal sector' and 'informal sector employment'. More recently, Dimova et al. (2005) use a multinomial logit model with the following choices: public sector employment, private sector employment, informal sector employment and no employment.

A final distinguishing feature of the study is its novel approach to eliciting information about an individual's perception of the level of risk of detection by the tax authorities, and modeling this perception using an ordered probit model. We know of no similar study in the extant literature. Related studies on tax evasion, which employ ordered probit models, model various aspects of tax evasion, but not risk perception. For example, tax morale is studied by Torgler and Murphy (2005) using an ordered probit model, with the dependent variable scaled

for an individual's level of tax morale. Cummings et al. (2005) investigate tax evasion and code the dependent variable according to the amount of times the respondent evades taxes. Even more recently, Tedds (2006) uses a similar categorization of the dependent variable to examine tax compliance of firms worldwide. In this paper, data are gathered from respondents who are asked directly about their own evaluation of the risk involved in concealing income from the tax authority. It is possible that their answers may reflect as much their subjective evaluation of the risk involved as well as their own subjective willingness to taking such a risk themselves. In the latter case, we may be therefore measuring the extent of 'risk-averseness' of the respondent.

In Section 2, some theoretical considerations about participation in the informal sector are given while, in Section 3, summary statistics of the data used for the empirical investigation are presented and analysed. Section 4 makes available the results of the econometric analysis of the decision to participate in the informal sector and, in section 5, we analyse the determinants of the perception of risk of detection by the taxman involved in that participation. Section 6 concludes the paper.

## 2. Theoretical Considerations

### 2.1 Tax Evasion and the Informal Sector

Studies confirm that an increase in the size of the tax burden, and the consequent desire to evade such taxes, is one of the main motivating factors behind participation in the informal sector (Giles and Johnson 2000, Schneider 2005). However, since tax evasion is a crime, punishable by heavy fines and even prison sentences, there is an inherent risk involved in such activity: the higher the perception of risk of detection by the tax authorities, the lower is the likelihood of participation in informal sector activity and, consequently, tax evasion. This last point may be attributable to Allingham and Sandmo (1972) who, in a seminal paper, suggest that

the decision to evade taxes results from the individual utility maximization problem where there is a trade-off between concealing income from the tax authority and the possibility of detection (and punishment): those who declare their whole income will have to pay the highest tax rate; those who declare only a fraction run the risk of detection and prosecution. In this model, the whole income is exogenously given and the declared income is the decision variable. The individuals maximize their 'von Neumann-Morgenstern' utility function by choosing the optimal taxable income. Allingham and Sandmo conclude that the higher the risk of being detected and the greater the punishment, the higher is the taxable part of the income.

Later studies (Isachsen and Strom 1980, Cowell 1985, Slemrod and Yitzhaki 1987, and Yamada 1990) show that increasing the audit rate raises reported income and seem therefore to provide further justification for the Allingham-Sandmo conclusion. Anderson (1977) shows that a rise in the tax burden has a negative effect on the labour supply and the declarable or formal sector income.

Isachsen and Strom (1980) try to model explicitly the informal sector by combining the theory of tax evasion with the model of time allocation. In contrast to Anderson, individuals here can divide their time between formal and informal sector activity as well as leisure, which now become the decision variables. Whereas the income gained in the formal sector is taxed directly, income earned in the informal sector is not. Therefore, tax evasion results from informal sector activity. Isachsen and Strom conclude that a higher marginal tax rate leads to lower formal sector participation. In this model, the marginal tax burden causes a rise in informal sector activities. However, one has to differentiate between income and substitution effects of the tax burden regarding the labour supply.

## 2.2 Excessive Government Regulations

Other work on the informal sector focuses on how it can be linked to burdensome government regulation. In particular, the literature indicates that there is a positive association between excessive government regulation and the size of the informal sector (De Soto 1989; Johnson et al 1999; Friedman et al 2000). Loayza (1996) uses proxies for excessive government regulation and the quality of government institutions and examines the impact of these factors on the informal sector. Specifically, he divides the price of operating in the official economy into entry costs (for example, registration and permit costs) and operating costs (taxes, bureaucracy and laws). Similar to, De Soto (1989), Tokman (1992) and Alm et al (1995) he found that burdensome government regulations augment the size of the informal sector.

## 2.3 Time Allocation

Becker (1965) is probably the first to extend the problem of efficient time allocation to one of deciding between different occupations: time is a scarce good that has to be distributed optimally, not only between work and leisure, but also between work carried out in the formal economy and that in the household (which is not quite the same as a differentiation between formal and informal sectors but he at least distinguishes between the formal sector and the self-sufficiency economy, part of the informal sector). Further adaptations of Becker`s model explicitly consider 'illicit' labour supply, such as de Gijsel (1984), who introduces a model based on the theory of multiple occupations. Starting from a microeconomic decision problem, de Gijsel investigates the influence of various factors on illicit labour supply. In de Gijsel's model, the increased rate of unemployment is a cause for the increase in the supply of labour to the informal sector as, in the formal sector, a higher employment risk is positively correlated with a

higher income risk. This induces individuals to engage in informal sector activities. Small-business owners, too, may, within a Becker-de Gijsel type framework, also wish to allocate their time efficiently among multiple occupations, including opportunities available in the informal sector.

## 2.4 Socio-economic and demographic considerations

The literature is replete with other influences, especially those of a socio-economic and demographic nature, that influence participation in the informal sector. It has been argued that informal activity tends to thrive in sectors of the economy which are characterized by labour-intensive, low-skilled and low-wage jobs and also where it is easy to employ and pay workers without registration or documentation (Djankov et al. 2003). Empirical evidence indicates that informal work in most developing countries is concentrated in the distribution sector, with a relatively low prevalence in certain sectors, such as the manufacturing sector (Castells and Portes 1989, International Labour Organisation 2002). Further, Marcelli et al (1999) and Losby and Edgecomb (2002) find that the characteristics of the construction sector make it easy to use the services of informal workers.

Lemieux et al. (1994) establish that there is a negative relationship between time spent in the informal and formal sectors, while Schneider and Enste (2003) provide evidence that some agents move seamlessly between the two sectors. Both Franicevic (1997) and Isachsen and Strom (1985) ascertain that income earned in the formal sector is negatively correlated with the level of activity in the informal sector. Similarly, Schneider et al. (2001) determine that individuals with lower incomes tend to be more active in the informal. However, Giese and Hoffman (1999) find that as income levels rose so too did informal activity. Christian (1994)

finds that individuals with higher incomes have a higher propensity to evade taxes, and this encourages an increase in the informal activity.

The sex of a person appears to play an important role in the informal sector: most empirical studies establish that males tend, more than women, to sell their labour services in the informal sector (Isachsen and Strom 1982, Baldry 1987, Giese and Hoffman 1999) while women, more than men, are likely to be clients of the informal sector (Schneider et al. 2001)[6]. Small-business owners may show similar patterns. Depending on the institutional structures in place, age can have varying influence on whether an individual will participate in the informal sector: some studies have found that age and informal sector activity are related, although there is no definite pattern emerging (Clotfelter 1983, Gerxhani 2002, Anderson 1998). In countries where the social security (e.g. pension) is inadequate, retired persons are more prone to enter the informal sector to supplement or maintain income levels (Portes et al 1986).

Other variables likely to affect informal sector participation are marital status (Anderson 1998, Schneider et al 2001), the number of dependents of the agent (Gerxhani 2002, Smith 1987, Schneider et al 2001), the area of residence of the agent (Portes and Sassen-Koob 1987 and Sasssen-Koob 1989), his/her level of education (Gallaway and Bernasek 2002) and others. Some will be considered explicitly in the empirical models in this paper.

### 2.5 Perceived risk of detection by Tax Authority-some considerations

The extant literature has nothing to say on this issue. However, based on the discussions above, in particular those of the tax evasion literature, it is possible to advance some working hypotheses. In the first instance, the small-business owner's 'perceived' risk may be as much a subjective evaluation of the risk involved, based on his/her personal experience and observation,

[6] Hoyman (1987) finds that women are likely to engage in informal activities at the same level as men, if not more, in some instances.

as well as it could be a subjective measure of his/her willingness to cheat the taxman (a reflection of the extent of his/her 'risk-averseness'). Given this, a small-business owner may feel that the less time he/she spends in the formal sector, the less the chance of detection. The 'front' provided by the formal activity masks the informal sector activity so there is 'opportunity' to participate without detection.

Earning a low income in the formal sector is consistent with less active time spent in that sector and is a recognized motivation for participation in the informal sector: it ought to make the business owner (or anyone else for that matter) more resolute to earn income by other means, foul or fair. In a similar vein, it may also be argued that the business-owner's risk averseness is tempered by a high tax rate and burdensome government regulations. This is a reflection of the 'tax morale' argument that appears in the tax evasion literature (Torgler 2003).

## 2.7. Empirically Testable Hypotheses

In all, seven empirically testable hypotheses, based on the foregoing theoretical discussion, will be elaborated and tested in this paper. The following four relate to the individual's decision to participate in the informal sector:

1. Ceteris paribus, the lower the chance of detection by the tax authority, the more small-business owners are apt to demand and supply goods and services in the informal sector;
2. Ceteris paribus, the stronger the small-business owner's perception of the tax burden, the stronger is the incentive to participate in informal sector activities;
3. Ceteris paribus, the stronger the small-business owner's perception of the burden of government regulations, the stronger is the incentive to engage in the informal sector;
4. Ceteris paribus, the lower the amount of hours spent in formal sector activity, the higher is the incentive for the small-business owner to be engaged in informal sector activities.

The remaining three hypotheses relate to the individual's perception of the risk that his/her non payment of taxes will be detected by the tax authority. They are:

5. Ceteris paribus, the less time spent in the formal sector, the lower the perception of risk of detection for non payment of taxes;
6. Ceteris paribus, the lower the income earned in the formal sector, the lower the perception of risk of detection of non payment of taxes;
7. Ceteris paribus, the greater the small-business owner's perception of the tax burden, the lower his/her perception of risk of detection of non payment of taxes;

Hypotheses 5-7 make even more sense if the measure of the perception of risk is also a measure of the willingness or unwillingness of the small-business owner to attempt cheating the taxman, as was discussed in the Introduction to this paper.

All our hypotheses are valid only with respect to 'ceteris paribus'.

## 3. Data Description for Empirical Investigation

The sample for this study consists of 1027 small businesses[7]. Because most of the respondents in a strictly random sample need not be involved in informal activities, two steps were taken to ensure that the sample included a representative number of informal sector participants. First, the sample frame used is a list of firms, compiled by the Central Statistical Office of Trinidad & Tobago, that employ five persons or less. For purposes of this study, these firms will comprise the small-business sector of Trinidad & Tobago: it is very likely that a great deal of informal sector activity takes place within and among these firms[8]. Second, interviewers were required to visit as many informal participants as possible, even if it involved asking

[7] The frame includes firms of self-employed professionals, like doctors and lawyers who, although registered with the tax authority, have the greater potential than salaried workers to evade taxes (Pissarides and Weber 1989 and Lyssiotou et al 2004).

[8] Johnson et al. (1999), who use survey data from private manufacturing firms in Poland, Romania, Russia, the Slovak Republic and Ukraine, determine that small businesses have better opportunities for tax evasion, for example through the route of the informal sector, because there is less risk of detection (due to their size). Similar considerations influence sample selection in other informal sector studies (Webb 1975, Bose 1978, Deshpande 1979).

respondents for addresses of other people engaged in informal activities. Such an approach is given intellectual justification by Renooy (1990) and it is similar to that taken by Pestieau (1985). Appendix I provides further details of the survey methodology.

Table 1 below lists the socio-economic, demographic and attitudinal attributes, which are assumed to influence the level of participation in the informal eonomy in keeping with the theoretical considerations outlined above. Each attribute is comprised of two or more mutually exclusive elements, which are referred to in this study as 'modalities'. All the modalities of each attribute, along with the 'reference' modality[9], are presented in Table 1.

[9] The reference modality is the element that is not used in the estimation of the model.

**Table 1**
Attributes and their Modalities

| Attribute | Reference Modality | Remaining Modalities |
|---|---|---|
| Sex | Female | Male |
| Age | Over 60 years | 15-25 years<br>26-35 years<br>36-45 years<br>46-60 years |
| Marital Status | Single | Married/Common Law<br>Divorced<br>Separated |
| Has Dependents | No | Yes |
| Area of Residence | Rural | Urban<br>Sub-urban |
| Living Arrangements | Living with relatives | Owns home<br>Renting |
| Level of Education | Tertiary | Primary<br>Secondary<br>Vocational |
| Sector of Activity | Other Sectors (including construction) | Services Sector<br>Distribution<br>Manufacturing<br>Agricultural |
| Time Active in Formal Sector | Over 12 hours per day | 1-6 hours per day<br>7-9 hours per day<br>9-12 hours per day |
| Income earned in Formal Sector | Over $10,000 per month | Less than $1,000 per month<br>$1,001-$5,000 per month<br>$5,001-$10,000 per month |
| Perception of Level of Risk of detection by Tax Authority* | | No risk<br>Low risk<br>Average risk<br>High risk |
| Opinion on Income Tax Burden | Not too high | Too High |
| Opinion on Government Regulations | Not too excessive | Excessive |

* No reference modality is given for this attribute since it is measured as an ordered response in the logit and probit models that follow.

Participation in the informal sector is defined over four categories: 'No participation' (respondent does not participate at all in the informal sector), 'Supply only' (respondent supplies, but does not demand, goods and services in the informal sector), 'Demand only' (respondent demands, but does not supply, goods and services in the informal sector) and 'Dual participation' (respondent supplies and demands goods and services in the informal sector).

Table A1 in Appendix 2 presents the frequency distribution of the attributes and all their modalities, along with the distribution of these modalities according to the level of participation.

Of the 1,027 respondents, 137 (a little more than 13%) do not participate at all in the informal sector; and of the 890 (approximately 87%) who do participate, 286 (approximately 28%) only supply goods and services; 220 (21%) only demand goods and services and, finally, 384 (37%) are both demanders and suppliers of goods and services. Approximately 53% of the individuals polled live in sub-urban areas and 58% of them have their own home. The highest percentage of respondents have at most secondary level education and most of the respondents are from the distribution sector (61.05%). The greater proportion of individuals surveyed earn less than $5,000 in formal sector.

The sampling distribution of the various modalities of an attribute provide some preliminary evidence about the nature and extent of that attribute's influence in the decision to participate, and the nature and extent of that participation, in the informal sector, though any conclusions drawn have to be validated by the more rigorous econometric analysis to follow. For instance, any marked difference in the sample distribution of the modalities of an attribute and the corresponding distribution in any of the categories is *prima facie* evidence that the attribute plays a role in determining participation in the category. The more marked the differences, the more important the attribute's role is likely to be. For example, just over 52% of the respondents believe that there is little or no risk of detection by the tax authorities if they participate in the informal sector, but they account for only about 36% of those who do not participate in informal sector activity. This seems to provide strong *prima facie* evidence for hypothesis no. 1. On the other hand, such evidence for hypothesis no. 2 is slightly weaker since, although just over 62% of those sampled think that the tax burden is too high, only about 46% participate.

Other interesting preliminary conclusions may be drawn. Close to 100% of those sampled spend a full 'working' day (7 hours or more) active in the formal sector, close to 89% spend

more than 9 hours and 52% spend more than 12 hours, and, except for the 'demand only' category, the proportions making up the sample are reflected fairly faithfully by the categories, which seems to be evidence against hypothesis no. 4. Also, around 54% of the total respondents are male, yet the males account for only 48% of those who do not participate in the informal sector. A priori, then, men are more like than women to participate in the informal sector.

## 4. Econometric Analysis of Participation in the Informal sector

A multinomial logit model is used to explain the level of participation in the informal sector ('No participation', 'Supply only', 'Demand only' and 'Dual Participation'). Each level is interpreted as a 'category' of the dependent variable in the model and it is assumed that the categories cannot be ordered. The 'no participation' category is designated as the benchmark or base category so that the corresponding vector of coefficients in the model is normalized to zero[10]. The estimated coefficients of the model are listed in Table 2 below:

[10] The purpose of this normalization is to identify the model's parameters. See Greene (2003) for a more detailed discussion of the estimation procedure.

**Table 2: Multinomial Logit Model Estimates: Comparison with 'No Participation'**

| **Attributes** *(modalities in italics)* | **Supply Only** | **Demand Only** | **Dual Participation** |
|---|---|---|---|
| Sex: *Male* | 0.518** (0.241) | 0.533** (0.252) | 0.414* (0.231) |
| Age: *15-25 years* | 2.642*** (0.720) | 0.263 (0.707) | 2.531*** (0.701) |
| *26-35 years* | 2.502*** (0.597) | -0.459 (0.518) | 2.297*** (0.569) |
| *36-45 years* | 2.348*** (0.557) | -0.389 (0.446) | 1.882*** (0.531) |
| *46-60 years* | 1.299** (0.538) | -0.534 (0.413) | 1.336*** (0.510) |
| Marital Status: | | | |
| *Married/Common Law* | 0.176 (0.331) | 0.789** (0.357) | 0.632** (0.319) |
| *Divorced* | 0.246 (0.625) | 0.873 (0.647) | 0.662 (0.594) |
| *Separated* | 1.728 (1.111) | 2.043* (1.128) | 1.901* (1.088) |
| Has Dependents: *Yes* | -0.431 (0.289) | -0.150 (0.297) | -0.090 (0.278) |
| Area of Residence: | | | |
| *Urban* | 0.553 (0.356) | 0.811** (0.362) | 1.070*** (0.340) |
| *Sub Urban* | 0.481* (0.287) | 0.539* (0.307) | 0.846*** (0.280) |
| Living Arrangements: | | | |
| *Owns Home* | -0.227 (0.342) | 0.237 (0.384) | -0.355 (0.331) |
| *Renting* | 0.073 (0.404) | 0.214 (0.452) | -0.062 (0.390) |
| Level of Education: | | | |
| *Primary* | -1.383** (0.690) | -0.124 (0.676) | -1.012 (0.648) |
| *Secondary* | -1.495** (0.660) | 0.086 (0.647) | -0.904 (0.618) |
| *Vocational* | -0.912 (0.722) | -0.663 (0.751) | -0.924 (0.683) |
| Sector of Activity: | | | |
| *Services* | 1.039 (0.679) | -0.308 (0.590) | -0.315 (0.535) |
| *Distribution* | 1.375** (0.672) | 0.128 (0.568) | -0.040 (0.523) |
| *Manufacturing* | 1.310 (0.808) | 0.167 (0.723) | -0.182 (0.681) |
| *Agricultural* | 1.771* (0.973) | -0.455 (1.014) | -0.198 (0.893) |
| Time Active in the Formal sector: | | | |
| *1-6 hours* | -0.452 (0.479) | -0.021 (0.514) | -0.553 (0.464) |
| *7-9 hours* | -0.460(0.393) | 0.178 (0.397) | -0.392 (0.371) |
| *10-12 hours* | -0.615 (0.376) | -0.205 (0.383) | -0.642* (0.356) |
| Income earned in formal sector: | 2.959*** (0.609) | -0.892 (0.642) | 1.318** (0.556) |
| *Less than $1,000* | 2.281*** (0.425) | -0.651* (0.348) | 0.983*** (0.338) |
| *$1001-$5,000* | 1.473*** (0.423) | -0.110 (0.331) | 0.266 (0.337) |
| *$5,001-$10,000* | | | |
| Perception of Level of Risk of Detection by Tax Authority | -0.104 (0.113) | -0.295** (0.116) | -0.404*** (0.108) |
| Opinion on Income Tax Burden: *Too High* | -0.185 (0.326) | 0.257 (0.330) | 0.195 (0.315) |
| Opinion on Government Regulation: *Excessive* | 0.262 (0.322) | 0.029 (0.318) | 0.615** (0.311) |
| Constant | -2.722** (1.189) | -0.043 (1.089) | -0.989 (1.060) |
| Hausman Tests of IIA | -8.373 [1.000] | 2.609 [1.000] | -4.928 [1.000] |
| Observations | 1011 | | |
| Likelihood Ratio | 348.48 [0.000] | | |
| McFadden's Pseudo-$R^2$ | 0.13 | | |

Standard errors in () parentheses; p-values in in [ ] parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%

First of all, the Hausman specification test (Hausman and McFadden 1984) provides no evidence that the 'Independence of Irrelevant Alternatives (IIA)' assumption has been violated (p-value =1 in all three cases), which is necessary for the validity of the multinomial logit model. The Likelihood-Ratio test[11] provides more general support for our model ($\chi^2$ statistic of 348.48 and associated p-value=0.000) and McFadden's Pseudo-$R^2$ is calculated as 0.13, which is an acceptable value[12].

The estimated coefficients in Table 2 represent the effect of the corresponding attribute's modality, relative to the excluded modalities, on the probability of selecting any of the three categories of participation shown in the table, with no participation in the informal sector as the base category. For example, the coefficient attached to the male 'Supply only' coefficient (significant at 5%) indicates, first of all, that, given the positive sign, men are more inclined than women (the reference modality) to participate in the informal sector. It also means, again given the positive sign, that men are more inclined to participate as suppliers only, rather than not participate at all (the base category). This result was anticipated by the preliminary analysis of the data and is consistent with those obtained by Giese and Hoffman (1999)[13] and Gerxhani and Schram (2001)[14], who used experimental methods, and those obtained by Isachsen et. al (1982), who employed data from a survey conducted in Norway.

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[11] Using the log likelihood of the full model ($\ln L_1$) with the one from the constant only model ($\ln L_0$) the likelihood ratio test statistic is computed as follows: $\chi^2 = -2\ln(\frac{L_0}{L_1}) = 2(\ln L_1 - \ln L_0)$

[12] It is possible that some of the variables in this equation may be simultaneously determined (particularly income, participation and 'hours spent in the regular economy'). The estimation technique used in this case will yield biased results and this should be borne in mind when interpreting the results shown in table 2.

[13] Geise and Hoffman (1999) employed the experiment method to investigate tax evasion and its determinants in Germany. Thirty-eight students, with equal amounts of males and females, participated in the experiment.

[14] Gerxhani and Schram (2001) examine tax evasion in Albania and the Netherlands using a series of separate experiments on high school pupils, high school teachers, university students, university academic staff and university non-academic staff.

An important result of this study is the negative and highly significant coefficients attached to the 'perception of risk' variable[15] in the 'demand only' and 'dual participation' categories. This finding indicates that business owners tend to participate less in the informal sector, either as pure suppliers or as both demanders and suppliers, the greater they believe the risk of discovery by the tax authority to be. This finding is consistent with hypothesis no. 1 and is similar to that obtained in other studies (Andreoni et al 1998, Jackson and Milliron 1986) where the probability of being detected along with the penalty imposed are significant stimuli in the decision to participate in the informal sector.

There also appears to be some support for hypothesis no. 3 (that excessive government regulations encourage participation in the informal sector) given the positive, significant (at 5%) coefficient attached to the 'dual participation' category. This is consistent with the results of other studies (De Soto 1989, Tokman 1992 and Alm et al 1995).

On the downside, there appears to be no support for hypothesis no. 2 that a burdensome tax regime leads to participation since the attribute is significant in none of the categories. This runs counter to the results of other studies, for example Clottfelter (1983), that tax evasion is positively correlated with the marginal tax rate, but it is not altogether surprising given some of the tentative conclusions drawn in the previous section. There is also only marginal evidence in favour of hypothesis no. 4 since time spent in the formal sector appears to have very little or no effect on participation in the informal sector: those who spend 10-12 hours in the formal sector are marginally inclined (significance at 10%) to participate less than those who spend more than 12 hours and, if anything, seem inclined not to participate at all (given the negative coefficient). This is at odds with results obtained by Lemieux et al. (1994).

[15] This variable is in index form as indicated in Table 1.

Other interesting conclusions may be drawn for the results. All the modalities in the age attribute are positive, large and highly significant in the 'dual participation' and 'supply only' categories, suggesting that respondents of all ages, relative to the reference modality, participate actively in the informal sector[16]. These results are different from the findings of both Gerxhani (2002) and Schneider et al. (2001) for Albania and Australia, which both found that age was a key determinant in supply rather than both demanding and supplying.

The 'married/common law' modality of the marital status attribute shows a significant positive coefficient in the 'dual participation' and 'demand only' categories indicating that married small-business owners are more likely than their non married counterparts to participate dually in informal activities. This result is similar to findings by Schneider et al (2001) and Anderson (1998), who both found this to be the case in their studies.

Positive and highly significant coefficients show that small-business owners living in urban and sub-urban areas are more inclined than those living in rural areas to participate dually in informal activities. Other studies done on the influence of residential area on participation in the informal sector (Portes and Sassen-Koob 1987, Sassen-Koob 1989) provide evidence that such activity is likely to be concentrated in areas where there is a large amount of both industrial and business activity taking place. In Trinidad and Tobago, most of the industries are found in sub-urban areas, whereas businesses can be found in the urban areas.

Small-business owners with primary and secondary educational levels are less likely than those with tertiary level education (reference modality) to sell goods and services in the informal sector and tend not to participate at all. This finding is similar to that of Stulhofer (1997) who

[16] Anderson (1998) using survey data from Mongolia's informal sector during the transition period found that the average age of persons involved in this sector was 37 years.

finds that work in the informal sector increases with the level of education but contradicts that of Gerxhani (2002) who finds that, in Albania, primary-level educated persons supply more informal activity than higher educated persons. Isachsen et al (1985) establish that persons with vocational level education are most heavily involved in the supply of informal work.

A significant positive coefficient indicates that business owners in the distribution sector are more likely than those in the 'other' sector (reference modality) to sell goods in the informal sector and are more inclined than those in all other sectors to participate in informal sector activity. Our results are consistent with those in the literature, since most studies that investigate the influence that 'sector of activity' has on informal sector activity found that such activity was most pronounced in the distribution sector (Castells and Portes 1989, International Labour Organisation 2002).

Small-business owners earning $10,000 or less in the formal sector are clearly more likely to participate in the informal sector, especially as sellers of goods and services. The lower the income earned in the formal sector, the more likely is that participation as is evidenced by the larger coefficient sizes. Comparable results from the extant literature are conflicting: the well-known Allignham-Sandmo (1972) model of tax evasion predicted that as formal sector income increases so does the likelihood of tax evasion, but this only holds true if the individual has decreasing absolute risk aversion. Empirical studies have found that informal sector activity was negatively correlated with income, which is what is established in this study (Franicevic 1997, and Isachsen and Strom 1985) and also that such activity increased with income earned (Giese and Hoffman 1999).

The results show that the 'Has Dependents' and the 'Living Arrangements' attributes do not explain the level of participation in the informal sector. We might have expected that the

larger the size of a household, the more likely is participation in the informal sector, both to earn income and to demand cheaper goods and services. We may also believe a priori that an individual owning his/her home is more likely to be active in the informal sector.

## 4. Econometric Analysis of Perceived Risk of Detection

It is often argued that tax evasion is a major motivating factor behind participation in the informal sector but it was shown above that a small-business owner will be less inclined to such participation if he/she believes that he/she will be caught by the relevant authorities. Informal sector participants face the risk of audit by the tax authorities and/or penalties and interest. Even though the system is one of self-assessment, the tax authorities may audit every taxpayer at its discretion. At present, interest is charged on the overdue amounts at 15% per year and interest on overdue tax is not a deductible expense in arriving at taxable income. What determines the small-business owner's perception of the level of risk of detection by the tax authority?

An ordered probit model is employed in this section to investigate the determinants of the perception of the level of risk of detection by the tax authorities. The level of perceived risk is ordered, from lowest to highest, as follows: 'no risk', 'low risk', 'average risk', 'high risk'. The independent variables are the very same modalities of the attributes appearing in Table 1 except that the 'participation' variable, which was the dependent variable in the Multinomial Logit Model, is excluded from the model[17], and that the risk perception attribute is now the dependent variable. The socio-economic/demographic predictors identified have often been used in tax evasion studies, such as those cited above. In this study it was hypothesized that these would

[17] It seems reasonable to suggest that a small-business owner's decision to participate in the informal sector will not be a factor determining his/her perceived risk of participation, at least in static framework used in this paper. The same caution about possible simultaneity bias in the case of the results shown in Table 2 also apply here, since some of the variables in this equation may be simultaneously determined. This should be borne in mind when interpreting the results shown in table 3.

affect the level of risk of participation since other studies have shown that some of these variables do influence an individual's tendency to evade taxes (Warneryd and Walerud 1982). For instance, a person who is employed part-time may experience greater financial strain and may be more prone to taking the risk of tax evasion (Mason and Calvin 1978) through informal sector participation.

The results are presented in Table 3 below:

**Table 3: Ordered Probit Results – Perception of Level of Risk of Detection**

| **Attributes** *(modalities in italics)* | |
|---|---|
| Sex: *Male* | -0.157** (0.073) |
| Age: *15-25 years* | -0.169 (0.200) |
| *26-35 years* | -0.237 (0.168) |
| *36-45 years* | -0.101 (0.157) |
| *46-60 years* | 0.054 (0.154) |
| Marital Status: *Married/Common Law* | 0.162 (0.104) |
| *Divorced* | 0.103 (0.189) |
| *Separated* | -0.375* (0.207) |
| Has Dependents: *Yes* | -0.159* (0.087) |
| Area of Residence: *Urban* | -0.009 (0.109) |
| *Sub Urban* | 0.194** (0.092) |
| Living Arrangements: *Owns Home* | -0.185* (0.101) |
| *Renting* | -0.241** (0.118) |
| Level of Education: *Primary* | -0.138 (0.173) |
| *Secondary* | 0.063 (0.161) |
| *Vocational* | 0.044 (0.190) |
| Sector of Activity: *Services* | 0.237 (0.172) |
| *Distribution* | 0.301* (0.167) |
| *Manufacturing* | 0.331 (0.218) |
| *Agricultural* | 0.323 (0.285) |
| Time Spent in the Formal Sector: *1-6 hours* | -0.134 (0.143) |
| *7-9 hours* | -0.306*** (0.111) |
| *10-12 hours* | -0.261** (0.109) |
| Income earned in formal sector: *Less than $1,000* | 0.152 (0.168) |
| *$1001-$5,000* | 0.128 (0.107) |
| *$5,001-$10,000* | 0.283*** (0.110) |
| Opinion on Income Tax Burden: *Too High* | -0.028 (0.098) |
| Opinion on Government Regulation: *Excessive* | -0.004 (0.099) |
| Thresholds: $\mu_0$ | -0.935 (0 .319) |
| $\mu_1$ | -0.006 (0.317) |
| $\mu_2$ | 0.765 (0.318) |
| Observations | 1011 |
| Likelihood Ratio | 59.34 [0.000] |
| McKelvey & Zavoina's $R^2$ | 0.08 |

Standard errors in () parentheses; p-value in [ ] parentheses; * significant at 10%; ** significant at 5%; *** significant at 1%

The likelihood ratio statistic, a measure of the overall goodness of fit of the model, provides evidence of a good fit (p-value of 0.00). The McKelvey-Zavoina $R^2$ is 0.08, an acceptable value in (cross-sectional) studies like these[18]

The estimated coefficients in Table 3 measure the influence of the corresponding attribute's modality, relative to the excluded modality, on the perception of risk involved. For example, the highly significant value of -0.306 attached to the '7-9 hours' modality of the 'Time' attribute provide convincing evidence small-business owners in this group believe that it is less risky (because of the negative sign) than those in the 'Over 12 hours' group (reference modality). This lends generous support to hypothesis no. 5, which is given further validity by the highly significant value of -0.261 attached to the '10-12 hours' modality: small-business owners in this group believe that their chances of detection are less than those of the higher reference group, but more than those of the lower '7-9 hours' group.

There appears to be relatively strong evidence against hypothesis no. 6 (the less income earned in the formal sector, the less the perceived risk of detection): the highly significant, positive coefficient attached to the '$5001-$10,000' modality indicates that small-business owners in that income bracket perceive a greater risk of detection than those in the reference modality group (over $10,000). But there is a possible rational explanation for this: declaring a low formal income, though more consistent with less time spent in the formal sector, is also more likely to attract the attention of the taxman than a high income. This consideration may lead the business-owner to believe that relatively low incomes earned (and declared) in the formal sector increase the risk of detection. The effect of a low formal sector income on the perceived risk of detection is therefore likely to be ambiguous, and ought to be determined empirically.

[18] Several authors (see Long 1997, Long and Freese 2006) prefer the McKelvey-Zavoina to the McFadden $R^2$ on the grounds that it more closely approximates the $R^2$ obtained from regressions on the underlying latent variable.

There is no evidence for hypothesis no. 7 (high tax rates result in lower risk perception). It could very well be that the small-business owner will attempt to cheat the taxman, whatever the rate, especially if he/she believes that this could be done with impunity. There may even be the belief that it may be politically incorrect to 'hassle' the small-business in a situation where there is widespread belief, and a lot of anecdotal evidence (as is the case for Trinidad & Tobago), that big businesses always cheat the taxman.

The results lead to some other interesting conclusions. There is evidence that men, more so than women (the excluded modality), believe that it is less risky (because of the negative sign) to participate in the informal sector, given the estimated coefficient of -0.157 (significant at 5%) attached to the Male modality of the Sex attribute. Business people living in sub-urban communities believe, more than their rural counterparts (reference modality) that there is a risk of detection. Those who own their own homes, or are renting, believe more than those living with relatives that the risk of detection is low. This may be more a reflection of a willingness to risk participation, encouraged by the costs associated with rent, mortgages, renovations etc., which people living with relatives may not have to face.

There is, finally, some small amount of evidence that small-business owners with dependents are less concerned with the risk of detection than those who have no dependences (coefficient of -0.159, significant at 10%). This is not unexpected: more dependents mean greater expense, which may be attenuated by participating in the more 'profitable' informal sector (if only because tax is avoided there). Those active in the Distribution Sector have a greater concern about detection than those active elsewhere (coefficient value of 0.301, significant at 10%) and this is very likely because this sector comes under greater scrutiny than the others, especially given anecdotal evidence that, in this sector, there is a large amount of non payment of the Value

Added Tax. Small-business owners, who have separated from their spouses, believe more than single persons (the reference modality) that the risk of detection is lower (a coefficient value of -0.375, significant at 10%). The attributes 'Age' and 'Level of Education' do not influence the perception of the risk involved: whatever the small-business owner's age or education, he she has the same attitude to risk, *ceteris paribus*.

## 5. Conclusion

Using the case study of Trinidad and Tobago, we investigate the socio-economic, demographic, and attitudinal characteristics of the owners of small businesses who participate in the informal sector of an emerging economy and their perception of the risk of detection by tax authorities while doing so. The results of the study suggest that small-business owners are motivated to participate in the informal sector when, among other things, they believe that the risk of detection by the tax authorities is low and that government regulations are burdensome, but there is no evidence that the tax rate itself is an issue. Their perception of the risk of detection by the tax authority is determined largely by the time they spend and the income they earn in the formal sector as well as by other socio-economic and demographic indicators such as sex, the area in which they live and the conditions under which they occupy their dwelling.

Governments and other state agencies may view informal business activity unfavourably if only because, *prima facie*, it deprives the State of revenue. To the extent, however, that the sector creates employment and generates income, that itself must add revenue to the coffers of the State, if only because it may dampen demand for State hand-outs. The State should therefore be very careful how it treats with informal business activity and should be minded at the very least to consider its potential for positive contribution. Nevertheless, there are some limited things the State can do to 'formalize' some of the activity, and this includes reducing some of the

burdensome regulations which encourage informal sector participation. In this case policy prescriptions should focus on simplifying the procedures in place by removing excessive bureaucracy, especially in the case of new and small businesses. Instead, the advantages to business owners who join the formal economy should be made obvious. Other incentives may be put in place in preference to, or even alongside, a punitive 'compliance' system, which may include an amnesty for a period of time during which time they can be incorporated into the formal sector without having to pay taxes for activity previously undertaken in the informal sector. Since the results show that business-owners in the distribution sector are the most likely to be involved in the informal sector, such policies probably need to be sector-based and aimed at engendering efficient management, promoting linkages between firms in the formal and informal sectors and ensuring that there is some targeted support, such as assistance with certain aspects of the management of the business.

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## Appendix I

## Survey Methodology

In order to obtain information on small business participation in the informal sector, a questionnaire was prepared to target small businesses operating in both the formal and informal sectors. Certain factors peculiar to individuals/units who participate in the informal sector were considered in designing the survey. Research shows that individuals/units who participate in the informal sector tend to be very heterogeneous with regard to type, size and sector of economic activity (Charmes 1999). They also have a tendency to be unevenly distributed within the general population and can sometimes be unstable, with regard to finances, employees and location (Verma 1999). In Trinidad and Tobago the population of interest is characterized by most of these features (see Rampersad 1987 and Lloyd-Evans and Potter 2002) and therefore the survey design selected to investigate small business activity in the informal sector was the two-stage, area-based technique.

At the first level the sampling frame was constructed of all the small enterprises operating in the country. This formed the Primary Sampling Unit and consisted of 13,078 small enterprises. At the second stage, 1030 units were selected systematically using the formula:

$$k = \frac{N}{n}$$

where, $k$ is the skip interval, $N$ is the population size and $n$ is the sample size.

As a result the sample was obtained by randomly selecting one element from the first 12 elements in the sampling frame, and every $12^{th}$ element thereafter.

The random walk method (Kazemier and van Eck 1992) was employed in this study to assist in the sampling process. Commercial research institutes commonly use this method when

undertaking surveys. With this method interviewers are asked to replace addresses by other addresses when there is non-response from units or when they are uncooperative. The use of this method ensures a less expensive survey since non-responses are replaced by responses and no recalls are necessary. Interviewers were asked to replace any non-response by a comparable response as far as possible (Kazemier and van Eck 1992), so for example, if there was a non-response by a motor mechanic it was expected that they would try to find another motor mechanic in the vicinity.

## Appendix 2
## Table A1
Frequency Distributions (%)

| **Attributes (Modalities in Italics)**<br>No. of Respondents → | **Sample Frequencies (1027)** | **No Participation (137)** | **Supply Only (286)** | **Demand Only (220)** | **Dual Participation (384)** |
|---|---|---|---|---|---|
| Sex: *Male* | 54.43 | 48.18 | 51.92 | 63.63 | 53.13 |
| *Female* | 45.57 | 51.82 | 48.08 | 36.37 | 46.87 |
| Age: *15-25 years* | 8.38 | 4.41 | 11.89 | 4.55 | 9.38 |
| *26-35 years* | 23.10 | 15.44 | 28.32 | 11.36 | 28.65 |
| *36-45 years* | 33.72 | 29.41 | 37.76 | 30.45 | 34.11 |
| *46-60 years* | 28.17 | 0.38 | 19.58 | 37.73 | 25.78 |
| *Over 60 years* | 6.63 | 50.36 | 2.45 | 15.91 | 2.08 |
| Marital Status: *Married/Common Law* | 64.85 | 65.69 | 55.24 | 76.36 | 65.10 |
| *Divorced* | 3.99 | 3.65 | 3.50 | 5.00 | 3.91 |
| *Separated* | 3.41 | 0.73 | 3.85 | 3.18 | 4.17 |
| *Single* | 27.75 | 29.93 | 37.41 | 15.46 | 26.82 |
| Has Dependents: *Yes* | 66.01 | 66.91 | 59.09 | 68.04 | 69.74 |
| *No* | 33.99 | 33.09 | 40.91 | 31.96 | 30.26 |
| Area of Residence: *Urban* | 26.58 | 24.09 | 20.63 | 35.00 | 27.08 |
| *Sub-Urban* | 52.48 | 45.99 | 55.94 | 46.82 | 55.47 |
| *Rural* | 20.94 | 29.92 | 23.43 | 18.18 | 17.45 |
| Living Arrangements: *Owns home* | 57.70 | 66.18 | 47.90 | 73.64 | 52.86 |
| *Renting* | 15.11 | 13.24 | 15.73 | 12.73 | 16.67 |
| *Living with Relatives* | 27.19 | 20.58 | 36.37 | 13.63 | 30.47 |
| Level of Education: *Primary* | 24.54 | 29.20 | 25.17 | 25.00 | 22.14 |
| *Secondary* | 61.25 | 58.39 | 57.69 | 64.10 | 63.28 |
| *Vocational* | 8.96 | 8.76 | 11.89 | 5.45 | 8.85 |
| *Tertiary* | 5.25 | 3.65 | 5.25 | 5.45 | 5.73 |
| Sector of Activity: *Services* | 26.48 | 25.55 | 31.12 | 18.18 | 28.13 |
| *Distribution* | 61.05 | 61.31 | 58.39 | 68.64 | 58.59 |
| *Manufacturing* | 5.46 | 6.57 | 5.24 | 6.36 | 4.69 |
| *Agriculture* | 2.24 | 2.19 | 3.50 | 1.36 | 1.82 |
| *Other Sectors* | 4.77 | 4.38 | 1.75 | 5.46 | 6.77 |
| Time Active in the Formal Sector | | | | | |
| *1-6 hours* | 1.07 | 2.21 | 0.70 | 1.36 | 0.78 |
| *7-9 hours* | 10.05 | 11.03 | 12.24 | 7.27 | 9.66 |
| *10-12 hours* | 36.88 | 32.35 | 35.66 | 3.91 | 38.12 |
| *Over 12 hours* | 52.00 | 54.41 | 51.40 | 87.46 | 51.44 |
| Income earned in formal sector: | | | | | |
| *Less than $1,000* | 7.01 | 7.30 | 10.49 | 3.81 | 6.51 |
| *$1,001-$5,000* | 49.07 | 43.07 | 60.14 | 27.27 | 55.47 |
| *$5,001-$10,000* | 26.48 | 30.66 | 24.48 | 33.64 | 22.40 |
| *Over $10,000* | 17.44 | 18.97 | 4.89 | 35.28 | 15.62 |
| Perception of Level of Risk of Detection by Tax Authority: *No Risk* | 19.71 | 16.67 | 14.39 | 17.81 | 25.78 |
| *Low Risk* | 32.45 | 19.70 | 30.88 | 37.90 | 34.90 |
| *Average Risk* | 26.37 | 36.36 | 30.53 | 26.03 | 20.05 |
| *High Risk* | 22.01 | 27.27 | 24.20 | 18.26 | 19.27 |
| Opinion on Income Tax Burden: | | | | | |
| *Too high* | 62.30 | 53.68 | 66.32 | 56.16 | 65.89 |
| *Not too high* | 37.70 | 46.32 | 33.68 | 43.84 | 34.11 |
| Opinion on Government Regulations: | | | | | |
| *Excessive* | 85.11 | 53.44 | 57.85 | 50.70 | 57.59 |
| *Not too Excessive* | 14.89 | 46.56 | 42.15 | 49.30 | 42.41 |