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Informal Economy: A micro-level analysis

Bachelor thesis

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Abstract

This paper analyzes association of informal economy with demographic characteristics. The first part introduces the definition and composition of the informal economy and sets the theoretical background. It presents its consequences and causes from different points of view. In the second part, we isolate characteristics that predict the propensity to work in the informal economy using the probit model. The work finds that the direction of individual effects matches with findings in Latin America reported by Perry et al. (2007).

Keywords

Informal economy, Shadow economy, South Africa, econometrics

Abstrakt

Táto bakalárska práca analyzuje vzťah šedej ekonomiky s demografickými charakteristikami. Prvá časť predstavuje definície a skladbu šedej ekonomiky a uvádza teoretický základ. Prezentuje dopady a príčiny z rôznych uhlov pohľadu. V druhej časti odlíšime charakteristiky ktoré predvídajú sklon k pracovaniu v šedej ekonomike použitím probit modelu. V tejto práci pozorujeme že smer jednotlivých efektov charakteristík súhlasi s výsledkami Perry a spol. (2007).

Klíčová slova

Šedá ekonomika, tieňová ekonomika, Južní Afrika, ekonometrie

Range of thesis: 37 pages; 55,334 characters

Declaration of Authorship

I hereby proclaim that I wrote my bachelor thesis on my own under the leadership of my supervisor and that the references include all resources and literature I have used.

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Prague, July 31, 2015

Signature

Acknowledgment

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Bachelor thesis proposal

This work analyzes which individual characteristics influence formal and informal market participation, through econometric analysis of indiviudual-level data from emerging markets, in which both informal and formal markets are extensive. The work is based on previous studies which identify education, parenthood and firm size as determinants of selection into each respective sector, using publically available micro-data.

–Review of relevant literature

–Microeconometric analysis.

–Interpretation of results in context of theoretical background

–presentation of results.

Main Sources:

Fajnzylber, Pablo, Guillermo E. Perry, William F. Maloney, Omar Arias, Andrew Mason, and Jaime Saavedra-Chanduvi . 2007. Informality: Exit an Exclusion

Eilat Y, Zinnes C. (2000): The evolution of the shadow economy in transition countries: consequences for economic growth and donor assistance. World Development

Jonasson, Erik. 2011. "Informal Employment and the Role of Regional Governance,", Review of Development Economics, 15(3), pp.429-441.

Schneider, F. (2014), "The shadow economy and shadow labor force: a survey of recent developments", IZA Discussion Paper No. 8278.

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Introduction

Whenever there are rules, there are also people who will break them. Similarly, it was a birth of the formal economy that gave an opportunity for its "evil twin" informal economy to exist. Because of that, even though the concept of an informal economy was first touched by Kevin Hart only in 1971, it is safe to assume that informal activities existed long time before that year. While a lot of work has been done on the matter since then, a lot of theories still remains unconfirmed by empirical evidence. This is due to the very nature of the topic that leads to a lack of solid information to work with. Operating within the informal economy usually entails a certain degree of illegality by definition, and therefore people are inclined to hide their participation in official statistics. Such motivations also make collected data veracity from official surveys and questionnaires ambiguous at best.

While this is an even more pressing issue on microeconomic level of research in which we will partake, the results can still have some merit. The insight into the field, and possible comparison with the existing literature it offers is still very interesting and valuable. After all, this uncertainty is ever-present when studying the topic of informal economy and is the reason for many, including me, to delve in the topic in the first place.

I have chosen data from South Africa to work with in this paper as I have found them to be the best match for this type of analysis. Informal economy is present in every single country around the globe, but it is the developing world where it is most rampant. Underdeveloped institutions and population growth outpacing the economic growth make for fertile grounds for the informal economy. Thanks to an extremely high level of inequality, South Africa is developed enough to have well-run institutions on a national level to reliably conduct and supervise costly surveys, while still maintaining characteristics of a developing country.

At the beginning of this paper I will define the subject of the analysis and discuss its characteristics. The second section elaborates on causes and consequences of the informal economy. The reasoning behind the decisions is looked through

from both macroeconomic and microeconomic lenses. In the last part, based on the theoretical and empirical work of other authors in the field, I look for who is the most likely to work in the informal economy based on their characteristics by running econometric regressions, namely the probit model. Conclusion will be given after that to summarize and present the work of the paper.

1 Definition of the informal economy

It is perhaps understandable that for such a heterogeneous topic as that of informal economy there is a lack of general agreement over something as basic as the name itself. Other terminology used to refer to what we call informal economy in this paper are for example "hidden economy" by Maurin et al. (2006), "irregular economy" by Ferman and Ferman (1973), "shadow economy" by Frey et al. (1982), or "underground economy" by Simon and Witte (1982). All of these terms describe a similar phenomenon, with the difference being the particular aspect of the topic they focus on, or from which scope they are focusing at. That being said, the common denominator of all of them is that they each work with activities that are imperfectly or not at all recorded in official national systems. Each of these definition have some merit, but for purposes of this paper, we will adopt the latest ILO's (International Labour Organization) definition.

Historically, the informal sector was defined almost exquisitely in opposition to the formal sector - as the total sum of all income-earning activities outside of legally regulated enterprises and employment relations. However, there are situations when enterprises operating in the formal sector hire wage workers informally, that were not captured under old definitions. Trying to accommodate to this fact, a term informal economy has started to been used by some researchers. To be able to define informal economy, we first need to understand what is informal employment. ILO defines informal work followingly: "Employees are considered to have informal jobs if their employment relationship is, in law or in practice, not subject to national labour legislation, income taxation, social protection or entitlement to certain employment benefits."

Because informal work can take many forms, defining the informal economy poses many challenges. Informal economy is then defined by ILO as composed of informal enterprises (small unregistered or unincorporated enterprises) and people working informally in both formal and informal enterprises. It is a very vague definition in a sense that it does not specifically enlist specific cases, due to the heterogeneity of its application. Therefore to understand it better, Losby et al. (2002) identifies four key characteristics of the informal economy.

1.1 Legality

Income generated from economic activities can be distinguished by legality of the process of producing or provision of goods and services and by legality of goods and services themselves. Food or hairdressing are for example both perfectly legal commodities, but they may come from legally regulated or unregulated production processes. For illustration, street food stall provides a legal product, some food that was bought in the supermarket that is being sold with an added value (e.g. by cooking it, or bringing it to a convenient location), to customers. The owner, however, may evade sales taxes or does not follow sanitation regulations and consequently, breaks the law. Opposed to this is a case of a drug dealer, whose product is illegal per se, by which he breaks the law no matter whether or not he pays taxes or obeys regulations.

Informal economic activity consists only of those activities that derive their illegality from violating principles of non-criminal law such as not filing taxes or adhering to labour laws. It is of the utmost importance to note that criminal activities (e.g. dealing drugs, human trafficking) are not covered in the informal economy as we defined it. While employment arrangements or production process in the informal economy can be illegal, the goods and services it produces, distributes and offers are all legal. This is one of the main differences between our definition of informal economy and other definitions such as shadow economy or underground economy that include criminal activities .

1.2 Medium of exchange

Transactions in the informal economy are by definition trying to stay mainly off the books, meaning that they are not captured by official records. Because of that, cash is the most commonly used medium (instead of bank transfers or checks) as it leaves no trace to be followed. Barter (direct exchange of goods or services without using a medium of exchange) is another often used way to facilitate exchange that escapes detection.

1.3 Unreported income and wages

Continuing from the previous point, as there are no records of transactions, there is no income to be taxed as well. Tax evasion is in fact usually the reason why economic agents operate informally in the first place. On a similar note, there is a mutual agreement between workers and firms about evading taxes. Informally working employees do not claim their income on tax forms and firms employing them do not file employee records. Both sides are incentivized by their personal gain (in form of the "self-imposed" tax relief), which enables this relationship.

1.4 Working conditions

The last outstanding characteristic of the informal economy are working conditions under which workers are usually employed. Since enterprises in the informal economy do not abide by labour laws, generally people working informally have worse working conditions than workers in the formal economy. This includes a range of downsides such as increased safety hazards, no minimum wage, lack of job security or lack of benefits like health insurance, social contributions, or unemployment insurance. Employment standards of working age and/or maximum length of the work week are also often forfeited.

2 Impact of the informal economy

It is important to realize what are consequences of the informal economy in order to know why we are studying it. As with many things, there are two sides of the coin when speaking about the effects of the informal economy on the total economy. Many people depend on informal employment for a living. While the consensus is that overall for the economy it is more beneficial for activities to be done officially than not, the verdict is much less clear when waging between unofficial activities and no activities at all. The positive side-effects of the informal economy have to be considered as well. Eilat and Zinnes (2000) summarizes pros and cons of informal economic activity in the following way:

2.1 Bad influence on the total economy

Firstly, one of the main negative effects has the form of tax revenue losses for the government. The fall in earnings from missing tax revenue can lead to a decrease in the quality of public goods and services. To a certain degree, enterprises in the formal economy gain more utility from public goods and services (e.g. law enforcement), and so the aforementioned decrease can make them reassess the value of functioning formally and push them to informality. This again further lowers tax revenues and consequently decreases the quality of public services, creating in a sense, downward spiral. On the other hand, if the government tries to increase taxes to compensate for tax losses, Laffer curve shows that it will lead to yet another expulsion from the formal economy, dwindle the tax base and therefore, in time, lower the tax revenue. In such cases, governments have often no other option but to resort to financing expenditures through high inflation.

Secondly, the presence of an informal economy reduces effectiveness of national policies. These policies can never affect the whole economy as individuals in the informal economy are less attached to the official system. For instance, entities operating informally do not participate a lot at capital markets or in banking system and therefore monetary policies are weakened. Similarly, legislators often rely on official statistics during the planning phase as an indicator when preparing policies. These statistics are however skewed in the presence of the informal

economy, as they do not account for people working informally. For example, an alarming increase in unemployment could be in reality just a shift from the monitored formal economy to the unmonitored informal economy.

Thirdly, informal economy has a significant effect on resource allocation in the economy. Informal firms have an inherent competitive advantage in the market as they do not comply with taxes nor follow regulations. Their cost of production is however also raised by costs of avoiding detection by authorities (e.g. bribes). If the avoidance expenses can be limited (e.g. by staying smaller in size), they can then undercut opposition or overpay workers while still staying profitable.

Additionally, Perry et al. (2007) specifies that informal economy is in many ways a drag on productivity and growth. Firstly, rigidities in the labour or product market prevent optimal allocation of workers among sectors which leads to losses in the total welfare. Secondly, workers that are not insured against adverse shocks have decreased motivation to invest in appreciating their human capital. Finally informal firms are less productive because they do not have access to credit or larger markets to utilize economy of scale. Formal firms are less productive because they have to compete with informal firms that have lower costs.

2.2 Good influence on the total economy

One of the largest positives of an informal economy is that it substitutes economic activity when the official economy underperforms. In situations of poverty and high unemployment, many workers would not be able to find a job if was not for working in the informal economy. The informal economy provides the only source of work and income for these people. On a similar note, whenever formal economy is reduced by rent-seeking and ineffectiveness that increases its production costs, informal economy can serve as an escape from artificially risen transaction costs. By doing so, it keeps the formal sector honest to a certain scale by providing more competition.

Contrary to the popular rhetoric that the informal economy has negative impact on taxes, it can have a positive effect on them as well. A large percentage, over 66 percent as per Schneider (1998) [1], of money earned in the informal econ-

[1] this number however also includes proceeds from criminal activities

omy is being spent in its formal opposite, boosting expenditures, and through that the amount of collected taxes.

Informal economy can also support entrepreneurial spirit and new ideas in the total economy as Kaufman and Kaliberda (1996) found for post-socialist countries. A potential entrepreneur with limited resources often finds bottlenecks to operating officially too restricting and discouraging.

3 Two perspectives on the rationale of the informal employment

What are the reasons for participation in the informal economy? There are two ways to look at this question - from the macroeconomic standpoint and from the microeconomic standpoint. To understand the topic further, there is no other way but to look for answers from both sides. Economies cannot be entirely understood without understanding individual economic agents that constitute them and vice versa, individual economic actions cannot be understood to the fullest without the context of the economy.

3.1 Macroeconomic point of view

Economic theory posits the role of the state in several ways as legitimate. The state addresses coordination and market failures by providing public goods (e.g. highways), preventing social bads (e.g. global warming), filling missing markets (e.g. courts and the law system). It also deals with social and power asymmetries in the society - redistributing from rich to poor, ensuring the labour-capital relationships are not exploitable by either side or that no enterprise or group of enterprises gain too much economic power (e.g. monopoly, oligopoly). To do so, the state imperatively needs resources and power to monitor and coerce economic agents to do things that they would not do otherwise. Almost every policy and action done by the government can be therefore broadly interpreted as an intervention in a market that distorts it in some form. Regulations and laws alter decisions that economic agents make by controlling and outlawing some actions. These in-

terventions by the government are making way for the informal economy, as more and more agents become less compliant. The specific factors that influence the size of the informal economy are numerous and so it is reasonable to mention only ones with the biggest impact. The next list reviews the most important factors that have been pointed out and summarized by Schneider and Enste (2000) and Schneider (2014).

3.1.1 Tax and social security contribution burdens

Tax and social security contribution burdens are generally considered as one of the main causes for the existence of informal economy. They affect the labour-leisure choices and stimulate labour supply in the informal economy. With an increasing difference between total labour costs and earnings after tax contributions (net salary), there is a raising motivation to avoid this difference and join the taxless informal economy. Empirical results from from past studies show that both direct (including social contributions) and surprisingly also indirect taxation have both significant impact on informal economy, Between those two, direct taxes have a much stronger effect, as moving to the informal economy is a straightforward way to evade them.

The rate of taxation is however, not the only aspect that influences the size of the informal economy, but also an excessive complexity of the tax system is yet another possible cause of distortion that, as noted in David Ulph (2013), incentivizes informal employment. Perplexing set of tax laws and regulations do not only reduces the overall efficiency of the system but also increases the level of legal uncertainty and furthermore, unnecessary tax complexity can also seldom lead to unintentional tax evasion.

Another factor is the efficiency of utilization of these tax charges by the government that also plays a role because it affects the tax morale in the society. Tax compliance is driven by a psychological contract with some rights and obligations between citizens and the state. People are therefore more willing to hold to their end and pay their taxes when the state operates fairly and transparently.

Furthermore, older work from Schneider (1998) shows that ex-post extensive tax reforms with considerable tax rate deductions might not result in the decrease

in informal economy. In such case, reforms would only lead to maintaining the status quo, stopping further increases. This means that once the "damage" is done, it is very hard to mend it. Such phenomenon is explained by costs of investments in capital, creating social networks and relationships when transitioning to the informal economy. These sunk costs then discourage people from returning to the formal economy in the future. This is a problem because the preventative nature of ex-post policies makes it less likely for politicians to push through these reforms as they would probably not gain anything from them.

3.1.2 Intensity of regulations

Regulations by definition limit what economic agents can and cannot do, therefore as they get more strict, boundaries of the formal economy figuratively shrink. These regulations (e.g. trade barriers, employment protections) are usually trading off freedom of choice for social utility, but in addition they lead to an increase in labour costs. These costs provide another incentive for enterprises to operate in informality, or if the costs are shifted to employees (resulting in a lower wage), for workers to switch to an informal economy. However, as found by Johnson, Kaufmann, and Shleifer (1997) what has real implications on the size of the informal economy is the intensity of enforcement of regulation rather than the intensity in sense of an area covered by regulations or their scale.

3.1.3 Public sector services

As mentioned in section 2.1, poor public sector services may lead to increased informal economy, which decreases tax revenues and consequently, further lowers the quality and quantity of public goods and services, creating a vicious circle. However in case of the right policies, by reversing the flow of thought, there is a possibility for virtuous cycle too. This results from the fact that formal economy is positively affected by public goods and negatively affected by taxes, while the opposite is true for the informal economy.

3.1.4 Social transfers

The social welfare system strongly disincentivizes its recipients from working in the official economy as the marginal gain from a formal job is lower. As informal workers are still unemployed from the perspective of the official statistics, they are often still eligible for social transfers. Therefore the welfare system can act like an income boost in the informal economy, making jobs there more attractive compared to formal ones.

3.1.5 Development of the formal economy

State of the formal economy is the last important factor in this list that affects the extent of the informal economy. Formal and informal economy compete for the same labour force within the total economy. The healthier and stronger formal economy is, the less reasons there are for people to join the informal economy. In prosperous times, when opportunities for appropriate employment are many, there is less incentive to work informally. The other way around applies as well though, during crises when unemployment rates and inflation spike, people may have no option but resort to working in the informal economy, even when it is not their preference. Indeed, statistics show that highly developed economies with the strong and stable formal sector have smaller informal economies than developing countries.

3.2 Microeconomic point of view

There are two major schools of thought on what determines why some employees work informally instead of formally. Traditional view states that a certain amount of workers are "excluded" from formal jobs. These workers would prefer to work formally with higher wages and social benefits if possible, but are not allowed to. The second view argues that workers "exit" formal economy voluntarily if it is to their benefit. As presented in Perry et al. (2007), rather than competing, these two views complement each other. Because of the very heterogeneous and complex nature of the informal economy, the influence of exclusion and exit are continuous rather than black and white. Additionally, social environment, history, and legal

framework differs immensely between countries, affecting the institutional setting to a great effect. Finally, there are situations when it is impossible to recognize which view is taking part. It is the same, whether an economic agent decides that costs of crossing into formality are not worth its benefits or that these high costs are what excludes him from doing so. An example of that would be a case of a worker from an area without access to healthcare in its vicinity, for he finds no value in paying for something he cannot utilize, but also cannot utilize it howsoever he would want to. The informal economy has also various layers and jobs that take many forms and some interactions may be more consistent with one view while other situations may favour the second. Through questions aimed at motivation and satisfaction of people who work in the informal economy in Brazil, Perry et al. (2007) finds that people working in an informal salaried work show more signs of involuntary entry that is characteristic for the exclusion view while informal self-employment inclines more to the exit view.

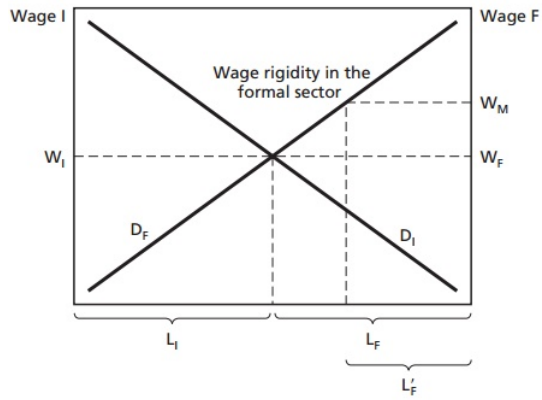
3.2.1 Exclusion theory

As presented in Perry et al. (2007), exclusion theory explanation for an existence of an informal economy worker sees informal jobs as a strictly inferior option to a formal jobs that only exists because of institutional rigidities in the formal system. Participants in the informal economy lack representation in politics (logically as these activities are de jure illegal) to change the laws that are causing the issue and so they do not have the ability to break the status quo. For that reason these rigidities in the formal economy are often correlated with poor institutions and state capture.

One result of such market rigidity are high market clearing wages (e.g. due to minimum wages or powerful unions), which cause workers to queue for formal jobs that they prefer. In the meantime they have to work informal jobs in order to sustain themselves, even though they are paid less and lack the benefits. Figure 3.2.1 depicts mentioned market situation. High market clearing wage W_m increases the size of informal employment as well as the discrepancy in wages between sectors. That means identical workers would earn more in formal jobs than their counterparts with informal jobs, and the latter will always switch if given a chance.

Under the exclusion narrative, opportunities to work in the formal economy are absolutely better and more desirable for every worker with no exceptions.

Figure 3.2.1: Relative sector sizes and wages under wage rigidity



Source: Perry et al. (2007)

Another case of market rigidities that cause expulsion from the formal economy are poorly designed taxes and regulations. Certain small firms could prefer becoming formal, but the expenses in form of costly registration and mandated non-wage benefits, restrain them from such action. Furthermore, as compulsory labour benefits and taxes increase, firms flexibility with workers and global competitiveness decreases. A different way to portray this is that firms are denied an opportunity to become formal because of high costs.

3.2.2 Exit theory - opting out

Perry et al. (2007) discusses exit as an equally important view, and further discusses it as follows. Opposed to exclusion, theory of exit does not regard formal jobs as superior to those informal. The welfare loss of not having the official social security backup and the potential risk of prosecution by authorities can be offsetted by other factors. It is assumed that each worker makes an implicit cost-benefit analysis of advantages and disadvantages whether to work informally and may choose to do so. This means that many informal jobs are comparable to their formal equivalents which require same qualifications. Workers are working here (informally) willingly and could work in a formal job, but decided against it,

as they have nothing to gain by switching. As it is, informality is not viewed as a negative thing from individual's perspective - in the end, each choice depends on personal preferences - the shape of ones utility function. Factors that may be accounted for when making a cost-benefit analysis include: job security (via employment protection legislation), welfare coverage , extent of sanctions if prosecuted and the perceived probability of prosecution for working an informal job, prospects of career progression, entry level requirements and training, wage, and work hours/schedule flexibility.

The main line of arguments lie on the premise that advantages of the formal jobs do not come for free. Their costs are reflected indirectly through security contributions to the system or directly in their lower wages and so workers can consider these benefits basically as an trade-off. Therefore in a situation when they do not value the benefits as much as the subsequent decrease in wages, they may "opt out of the system" and join the informal economy. Perry et al. (2007) explains rationale behind exit in several cases. Informal jobs should theoretically offer higher financial payoff for they have to forgo value in the form of benefits as social protection and have a higher risk of being let go (as they are not covered by labour protection). Poverty-stricken workers or those on the verge of poverty are often more than willing to sacrifice savings in order to bolster current consumption. In such cases, strict budget constraints may deem saving for future welfare unaffordable as there is a pressing need to shift their utility function in favour of increased present consumption. This behaviour can also lead into raised levels of informal employment during crises.

Another case by Levy (2006) shows that with high transition rates between sectors, many workers cannot accumulate enough months of working formally in order to receive meaningful pension. The risk of these pension payments being rendered useless (and in doing so becoming a net loss) further discourages workers from working formally.

Even when workers do not fear that they will be unable to accumulate enough working time in formal jobs to become eligible for pension and social benefits, the quality of these benefits may be often questionable. Mostly happening in

developing countries, low level of institutions combined with the high level of bureaucracy can result in an ineffective use of contributions making benefits not being worth the cost. This is of an even greater significance considering there are often alternatives to the official welfare package in form of informal support networks that function on the local level with lower operating costs. These informal insurance programmes take advantage of social assets like reputation and a threat of social isolation, but also physical retribution [2].

Moreover, there are several cases when working formally is not necessary to enjoy certain advantages of doing so. One such example is a phenomenon of "lighthouse effect" coined by Souza and Baltar(1980), which describes a situation where minimum wage acts as a reference point for wage negotiations in the informal economy. Therefore, although labour protections do not affect informal jobs directly, a rise in minimum wage indirectly boosts wages in informal economy. Another example is when one member is formally employed often the whole family enjoys the medical insurance coverage. After the first one, other members of the family gain substantially less by working in a job that provides medical insurance, and indeed as found by Galiani and Weinschelbaum (2006) for countries in Latin America, "ceteris paribus, secondary workers are more likely to operate formally than primary workers are". As such, an increase in secondary workers participation would increase the level of informal employment.

An analogy similar to individual's choice can be drawn to firms about their decisions on whether or not be formal. Same as workers, firms consider various of factors in their own cost-benefit analysis. They weigh increased expenses(in form of taxes, mandated benefits) against what working formally gives them: access to more relaxed borrowing constraints, additional growth possibilities (larger informal firms are more prone to detection) and institutional support provided by the government. Because of that, entrepreneurs with the underlying ability to develop eventually transfer to the formal economy.

[2]Morduch(1999) has reported that these substitutions can indeed soften potential income shocks.

4 Typology of participants in informal employment

Discussing the reasoning behind a growing informal economy leads us straight to another question: What is the demography of those who join the informal employment? In other words - we are looking for potential influences on the likelihood of working informally, who is most likely to participate in the informal economy. It is important to identify these patterns, as they hint towards the underlying motivations and help in further analyses of the informal economy.

Every individual wants to preferably find a job that maximises their utility. This utility depends on a mix of individuals skills, innate talents, and preferences, where preferences involve both pecuniary and nonpecuniary aspects of work. From then, it is not surprising that certain groups with shared characteristics may find their best fit in the informal economy and therefore have a higher propensity to work informally. Literature on the topic of informal economy in developing countries, e.g. Perry et al. (2007), Losby et al. (2002), Maloney (2004), Packard (2007), lists these situations as the most prolific cases:

- **Women**: In some developing countries women have limited opportunities to work due to gender inequality. Additionally, raising children and working simultaneously requires flexible work schedule and autonomy that can be more easily found in the informal employment

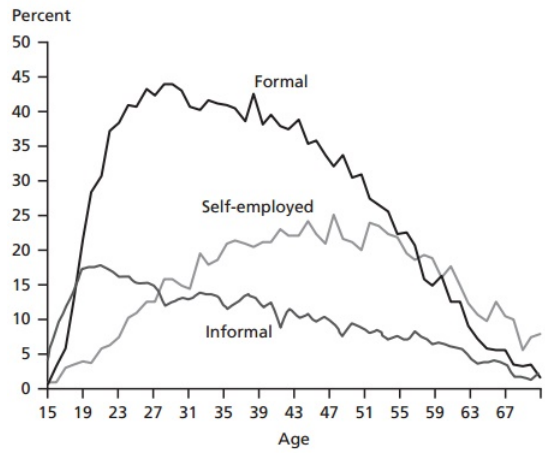
- **Young people with lackluster skills**: With underwhelming education and/or experiences, informal jobs may be more prone to provide them with on-the-job training

- **Older people with obsolete skills**: Contrary to young people, their skills may become outdated to the point of requiring on-the-job training, additionally older workers often choose to pursue self-employment in the informal economy.

- **Education**: Education is another important factor determining selection into formal or informal employment.

Based on the information presented in previous points Perry et al. (2007) suggests that there are life-cycle patterns in dynamics between the formal and informal employment at the individual level. Informal salaried sector is often a point of entry to the workforce for young people. Then as they accumulate more skills, they can eventually find a job in the formal sector or if they desire so, they can become informally self-employed. Therefore the share of the informal salaried sector peaks amongst young workers and then it slowly declines until it hit a plateau where only people who lack the skills or capital to become self-employed or get a formal salaried job stay, or they stay working informally salaried because it is too late for them to accrue enough years to get a pension. By contrast, share of the informal self-employment peaks around late middle-age because of high costs of starting your own microenterprise. The formal sector is largest among prime-age workers. From that, young and late middle-age or old workers should be statistically more likely to work in the informal economy. Figure 4.0.2 illustrates the rate of urban employment across sectors by age in Brazil.

Figure 4.0.2: Rate of urban employment across sectors by age



Source: Perry et al. (2007)

The aim of the rest of this paper is going to be testing if these aforementioned groups do have higher tendency to work informally. Regression analysis can be used to isolate characteristics that best predict the propensity that a given person engages in the informal economy. These findings are and will be more of a suggestive character than conclusive, yet still informative.

5 Data and methodology

Even though it is theoretically nearly impossible to obtain precise data on the subject, it is feasible to measure or proxy informal employment directly, using tax audits and household survey questionnaires designed for this purpose. This direct method of collecting data is microeconomic in nature and while there are many significant disadvantages of the direct method[3], it is the only way to obtain data on microeconomic level.

This thesis employs publicly available data from Quarterly Labour Force Survey (QLFS) from South Africa, which collects information on demographic characteristics (e.g. gender, age, education) and labour market characteristics. To represent the whole population, the dataset is weighted and the final weight is included in the dataset. The QLFS is conducted quarterly as a rotating panel with one-fourth of the sample refreshed every quarter. This system of rotations result in a big overlap between the samples within an one year period. For those reasons I use data from the first report of every year from 2011 to 2015 as repeated cross sections and treat the survey as it is annual. Dataset is for our purposes restricted to only working individuals, which leaves us with 96,711 observations. Variables used for the analysis consist of informal employment as an dependent variable, gender as an independent dummy variable and age (15-24, 25-34, 35-44, 45-54, 55-64, 65+ age intervals), race (black, coloured, indian, white), and education (no schooling, primary, secondary ,or tertiary level finished) as independent categorical variables.

5.0.3 Probit

One of the most used courses of action when dealing with analysis like ours is to run simple probit regressions. In our case, we will use probit to estimate effect of different specific individual characteristics on the likelihood of working in the informal economy. Probit model is appropriate for situations where the dependent variable takes binary values, which is exactly our case. Probit model has the

[3]dependance on interviewees cooperation, or as Schneider (2002) notes, selectivity bias through high non-response levels

following form:

$$P(y = 1|x) = F(\beta_0 + \beta x)$$

where P denotes probability and F is a cumulative distribution function:

$$F : x \mapsto [0, 1], \forall x \in \Re$$

For probit model, the cumulative distribution function takes form of standard normal cumulative distribution.

$$F(x) = \Phi(x) = \int_{-\inf}^{x} \phi(z)dz$$

where $\phi(x)$ is standard normal density function:

$$\phi(x) = \frac{e^{-\frac{1}{2}x^2}}{\sqrt{2\pi}}$$

5.1 Empirical Results

We will use 35-44 year old for the age, white for the race and no schooling for the education as the reference groups.

Table 5.1: Estimation results : probit

Variable	**Coefficient**	**(Std. Err.)**
female	0.160**	(0.011)
black	0.463**	(0.024)
coloured	-0.072*	(0.028)
indian	0.083†	(0.044)
primary	-0.381**	(0.016)
secondary	-1.033**	(0.018)
tertiary	-1.635**	(0.023)
age15_24	0.267**	(0.020)
age25_34	0.085**	(0.014)
age45_54	-0.064**	(0.016)
age55_64	-0.071**	(0.021)
age65	0.518**	(0.059)
Intercept	-0.274**	(0.030)

†significant at 10% level, *significant at 5% level, **significant at 1% level

data: Stats SA, calculations: author

Pseudo-coefficient of determination for our model is slightly above 14%. This number should be satisfactory for analyses in the social sciences field of work, more so when our model consists only of qualitative variables. However, coefficients for variables cannot be straightforwardly interpreted in this probit model because they are representing effects on a cumulative normal function of the probabilities that the response variable equals one rather than direct effects. However it is still possible to observe whether their signs are positive or negative and if they are significant or not. We can see that all of our variables but *indian* are significant at the 5% level. *Female*, and age groups for 15-24 year old, 25-34 year old, and 65 year and above old all have positive effects, which means they are more likely to be defined as informal compared to male population or 35-44 age group respectively. This finding is in line with our assumptions about these groups. Age of 65 and above is however already past the official retirement age, so it was expectable that workers above this age are more likely to work informally. Based on the literature one would expect that late middle-age workers of age range 55-64 would have positive effects as well, but it is not the case here. With the white population as the reference group, we get that black population has positive effect in our regression. This occurrence could be potentially explained as a remnant from the long history of racial segregation - apartheid in South Africa, when white minority ruled over the black majority. *Coloured*[4] has negative effect but it is not significant at the 1% level. On the other side, all levels of education show strong negative effect. This finding weighs more in the side of the exit theory, which says that informal jobs are inferior to those in the formal economy. In that case it could be understandable that higher education gives a potential worker the edge over competition when looking for a formal job.

For better interpretation of our results, instead of coefficients of individual independent variables we can use average marginal effects. The marginal effect is obtained as a derivative of the probit function:

$$\frac{\partial F(x\beta)}{\partial x_j} = f(x\beta)\beta_j$$

[4]An ethnic label for people of mixed origin in South Africa

Table 5.2: Estimation results : probit

Variable	**Coefficient**	**(Std. Err.)**
female	0.048**	(0.003)
black	0.139**	(0.007)
coloured	-0.022*	(0.008)
indian	0.025†	(0.013)
primary	-0.114**	(0.005)
secondary	-0.310**	(0.005)
tertiary	-0.491**	(0.006)
age15_24	0.080**	(0.006)
age25_34	0.026**	(0.004)
age45_54	-0.019**	(0.005)
age55_64	-0.021**	(0.006)
age65	0.156**	(0.018)

†significant at 10% level, *significant at 5% level, **significant at 1% level

data: Stats SA, calculations: author

Now we can interpret the marginal effects of each variable, which for binary variables measure discrete change - how the predicted probabilities change as the binary independent variable changes from 0 to 1.

- **female**: We interpret the size of the marginal effect as that the probability a person is working in the informal economy is 4.8% higher if it is a woman.
- **education variables**: Any additional level of education achieved increases the likelihood of working formally by a huge margin. Completed primary and secondary education decreases the chance of working informally by 11.4% and 31% respectively when compared to people with no level of education finished. A degree from an university gives its holder a staggering 49.1% lesser chance of working in the informal economy compared to people with no schooling. From our tested characteristics, education is the largest factor by far.
- **race variables**: Black population is among race subgroups the most likely to be working in the informal employment with 13.9% higher probability than white population. Other race variables have comparatively much smaller effects if any, with being indian increasing the probability by 2.5% and coloured remaining insignificant.
- **age variables**: The model agrees with the assumption that workers on the younger spectrum will have a higher probability of working in the informal economy compared to prime age workers. While not as impactful as education, workers between age 15 and 24 are 8% more probable to work informally and older workers, who are past their retirement age, have this probability increased by 15.6%

While the previous regression showed us that women are more likely to work in the informal economy, the literature often specifically states that it is child rearing which incentivizes women to work informally. If that is true, the effect is underestimated as we grouped mothers and women without children together. Thanks to the household character of our dataset, we are able to address this by creating a new variable, *children*, that stores the information whether a person has

a child under 5 years old. In the next regression, we will also divide the population into two subgroups based on gender. This should isolate mothers, but additionally we can also observe differences across the gender in other variables as well.

Table 5.3: Average marginal effect of the probit model with male/female

	Female	Male
children	0.00387	0.00198
	(0.79)	(0.39)
black	0.124***	0.151***
	(12.18)	(14.93)
coloured	-0.0577***	0.0117
	(-4.81)	(0.99)
indian	-0.0645**	0.0787***
	(-3.01)	(4.65)
primary	-0.122***	-0.109***
	(-17.17)	(-16.39)
secondary	-0.331***	-0.289***
	(-43.65)	(-40.81)
tertiary	-0.529***	-0.445***
	(-63.85)	(-48.01)
age15_24	0.0453***	0.107***
	(5.06)	(13.90)
age25_34	-0.00242	0.0468***
	(-0.39)	(8.06)
age45_54	0.00301	-0.0437***
	(0.47)	(-6.37)
age55_64	-0.0123	-0.0315***
	(-1.38)	(-3.42)
age65	0.160***	0.145***
	(6.25)	(5.87)
N	46357	50354

t statistics in parentheses

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

omitted variables: white, noschool, age35_44

The new variable factoring for parenthood is insignificant in both cases, so we can not observe how having kids affects the probability to work in the informal economy for both men and women. I tried to substitute *children* variable with a variable for marriage, as some studies show that single women have even higher participation in the formal economy than men (e.g. Bosch and Maloney (2005)), but it was insignificant as well in our case. Nevertheless, we can observe some interesting trends between female and male subpopulation. Several variables that were significant before are no longer significant after the division. From those variables which remained significant, we can see that education has a stronger negative marginal effect for women than men across all levels. This finding is open to more interpretations than one. For example, it could mean that there are higher requirements for women in South Africa when applying for formal jobs. This could stem from discrimination and gender inequality still present in developing countries that South Africa is. The other explanation could be that women with higher education are more likely to pursue career in the formal economy instead of juggling housework and a more flexible job in the informal economy. Their ambitions and the decision to focus more on the career often precedes and coincides with the decision to attain higher education. Overall, however, the marginal effect of the education for both genders still stays very high in absolute value.

Black has a slightly positive higher marginal effect for men, but what is really interesting is that indian is negative for women and positive for men. The probability of an *indian* man to be informally employed is 7.9% higher than of a white man, while on the contrary the probability of an indian woman to be working informally is 6.5% lower than of a white woman. For this phenomenon we have no reasonable explanations. A far-fetched line interpretation is that it is perhaps because the overall informal employment rate in mainland India is as high as 80% and therefore there is no social pressure for primary workers, which are culturally mainly men, to have "legitimate" job. Men can then focus on informal jobs with better wage while women provide the family with health insurance from the formal job. This is however a very unlikely reason. For age variables, the 65+ retirement age and 15-24 age group still have positive effect as in line with the literature for both genders. Other age variables are insignificant for women while retaining

their effect for men. This means that we are able to observe the life-cycle theory of formal-informal dynamics in South Africa only for men.

Overall, the effect of demographic factors on informal market participation in South Africa are matching with findings by Perry et al. (2007) in Latin America. The education is the largest indicator whether a person will work informally. Perry et al. (2007) suggests here that the diploma serves as a signal to employers that a worker has the minimum skills required to justify the cost of the formal contract. This is more important in a case of job queueing in the presence of market rigidities as presented in the exclusion theory. We also found that women are more likely to work in the informal economy than men in South Africa which is in line with Perry et al. (2007). However our results show that marriage status and having children have no role in this like Bosch and Maloney (2005) found in Argentina, Brazil, and Mexico. The life-cycle theory by Perry et al. (2007) was observed only for men in South Africa. All these factors indicate that the gender inequality could still remain an issue in South Africa. Race having such a large impact could be a surprise in a vacuum, but it is not unexpected to encounter these results in South Africa. With apartheid abolished only 20 years ago, vestiges of the old regime still shape South African economy and society.

For our analysis we have used data from 2011 to 2015 period. However, a lot can change over this span of time, particularly in a developing country that relatively recently underwent changes as big as the abolition of apartheid. It is possible that some factors have changed during this short period that were completely missed because of our data pooling. Because of that we will run probit regressions on the dataset from 2011 as well as the dataset from 2015 to see if there are any significant changes.

Table 5.4: Comparison between 2011 and 2015

	2011	2015
female	0.091***	0.013
	(0.008)	(0.007)
married	-0.046***	-0.038***
	(0.008)	(0.007)
black	0.163***	0.111***
	(0.016)	(0.016)
coloured	-0.004	0.038
	(0.019)	(0.020)
indian	0.021	0.065*
	(0.030)	(0.028)
primary	-0.139***	-0.113***
	(0.011)	(0.010)
secondary	-0.348***	-0.318***
	(0.012)	(0.011)
tertiary	-0.524***	-0.474***
	(0.015)	(0.013)
age15_24	0.065***	0.061***
	(0.014)	(0.013)
age25_34	0.026*	0.015
	(0.010)	(0.009)
age45_54	-0.012	-0.016
	(0.011)	(0.010)
age55_64	-0.026	-0.022
	(0.016)	(0.014)
age65	0.167***	0.078
	(0.039)	(0.045)
N	18492	17940

t statistics in parentheses

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

omitted variables: white, noschool, age35_44

The first thing we can notice is that every variable has smaller marginal effects in 2015 compared to marginal effects in 2011. This means that differences between all variables and their respective omitted variables have decreased. In case of the gender and race we can interpret this result as a possible reduction in inequality between genders and races during this period. While the decrease in propensity to work in the informal economy does not tell anything on its own on this matter, in context with the South African socio-economic setting it is possible to interpret it as a suggestive sign. It is most probable that as time goes, vestiges of apartheid will slowly wither away, especially with the South African government actively trying to mend problems it left. An decrease in the marginal effect of *black* is a good sign that their efforts have some effect. Gender inequality is another problem that long troubled South Africa and many actions have been made in order to deal with this issue, going as far as having Commission for Gender Equality established in its own constitution. In case of job queueing for formal jobs that exclusion theory presents, the decrease from 9.1% to 1.3% for *female* is a leap in the right direction on the way in the quest for gender equality. *Female* in 2015 is however significant only at 10% level. *Married* is for the first time significant with -4.6% and -3.8% effects for 2011 and 2015 respectively, meaning that a person is less probable to work an informal job by that percentage if he is married. Unfortunately every attempt to isolate marriage for females yielded insignificant results. For age variables, many became insignificant or less significant. For those variables that remained significant, nothing much has changed except the already mentioned decrease in marginal effects in 2015 compared to values in 2011. On the other hand, all variables for education remained extremely significant. However, just like positive effects of other variables decreased in 2015, the negative effect of education variables has decreased as well. The marginal effects have dropped from -13.9% to -11.3% for finished primary education, from -34.8% to -31.8% for finished secondary education, and from -52.4% to -47.4% for finished tertiary education. This drop could be caused by a myriad of factors, for instance a lot of new job positions that do not require higher education could have been created in this time.

Conclusion

This paper provides a detailed description about the informal economy and then tries to investigate how are various demographic characteristics associated with informal employment. There are many interpretations and wordings for the exact definition of the phenomenon, but I decided to use the latest version of ILO's definition which extends the concept to the formal enterprises that partially employ informal workers and distinguishes itself from criminal illegal activities. The distinction between criminal and informal economy is too large and would further diversify an already very heterogeneous topic. Furthermore, our microeconomic data are aligned with this definition, mainly due to the fact that while data for informal employment is hard to obtain and/or proxy, microeconomic data for successful long-term criminal activities are plain impossible to obtain.

The paper then summarizes consequences of the informal economy in order to shed light on the reason why to study informal economy in the first place. The negative impacts like loss in tax revenues, reduced effect of national policies, and reduced efficiency of resource allocation are well established facts by now. There are however also opinions that informal economy has positive impact as well, for example in form of providing employment in times when formal economy underperforms.

Causes and motivations behind the informal economy are looked upon from two perspectives. From the macroeconomic point of view almost any intervention by the government in the market can be considered as a cause of the informal economy. Taxes and social contribution burdens, intensity of regulations, level of public sector services, system of social transfers in the economy, and the development of the formal economy are the most important factors that contribute to its growth. The microeconomic point of view presents two major school of thoughts on the matter. Exclusion theory views informal economy as an inferior sector where people work because they cannot find a job in the formal economy. Exit theory presents the informal economy like an equal to the formal economy in eyes of a worker. It has its disadvantages but also advantages compared to the formal economy and in the end, it is up to individual preferences and values which sector

will the worker choose. These two theories coexist rather than compete, which is possible because of the heterogeneous character of the issue.

In the empirical part of this paper, I isolated demographic characteristics using probit in order to determine how they affect the propensity to work in the informal economy. There is an important issue with endogeneity when it comes to our regressions. Combining the nature of the topic and limitations of even the most comprehensive datasets, we cannot easily resolve the problem of omitted variables. The survey isn't equipped for things such as controlling for all of the influences on our variables like education. However we have to be aware of the bias and proceed with caution when interpreting our results. Causality is also a possible issue, as education is undoubtedly causally related with some race variables. Non-white people had very limited access to education during apartheid and therefore they may be underrepresented in higher education variables. The same applies for the connection between age variables and education variables - many generations of the non-white majority did not have access to education and therefore higher education variables will be more leaned towards younger age groups. Even gender and education variables are causally connected to a certain degree as due to long-enrooted gender inequality, women were underrepresented in schools as well. White, male and low end of age variables therefore probably have a bias towards formality because they are overrepresented in higher education variables. Scales and exact numbers in our results can be therefore very misleading. The problem of endogeneity could be better addressed in the future by collecting more data for that purpose and employing models that can control these factors. Such measures are however currently out of the scope of this paper, but there is definitely space for improvements in future research.

The findings in this paper are generally in line with previous empirical work, specifically Perry et al. (2007). Education, gender, and age are all significant in our regression. People with higher education and men are less likely to be informally employed compared to people with no schooling and women respectively. For men, we could see also observe indicators of the life-cycle theory which proposes that many people start their career in the informal salaried sector, progress to the formal sector as they accumulate more skills and experiences, and some then end

their career informally self-employed. Significance of race variables is a specific trait of the South african economy with its history of racial segregation. Even 20 years after repealing discrimination laws, black people still have higher propensity to work informally compared to white people.

We can see firsthand in this paper that the institutional setting matters greatly when doing any kind of analysis. Like any country on the world, South African economy and labour market have their own specifics. The biggest factor that shaped the profile of the labour market in South Africa was undoubtedly the apartheid. It is very probable that race variables in regressions were affected by the legacy of apartheid. Under the old regime, the black majority had limited educational opportunities and was largely confined to locations outside city centres, lowering their human capital. Lack of skills among a large proportion of the labor force and geographical obstacles to job search largely affected the economy as a whole as well. Therefore even though apartheid is already abolished, some of its effects still linger on and will take a lot more time to vanish completely.

References

[1] Bosch, M., & Maloney, W. F. (2005): Labor market dynamics in developing countries: comparative analysis using continuous time Markov processes, *World Bank Publications, (Vol. 3583).*

[2] Eilat, Y., & Zinnes, C. (2000): The evolution of the shadow economy in transition countries: consequences for economic growth and donor assistance, *Discussion papers, (83).*

[3] Ferman, P. R., & Ferman, L. A. (1973):. The structural underpinnings of the irregular economy. *Asia Pacific Journal of Human Resources, 8(1), 1-17.*

[4] Frey, B. S., Weck, H., & Pommerehne, W. W. (1982): Has the shadow economy grown in Germany? An exploratory study, *Weltwirtschaftliches Archiv, 118(3), 499-524.*

[5] Galiani, S., & Weinschelbaum, F. (2012): Modeling informality formally: households and firms, *Economic Inquiry, 50(3), 821-838.*

[6] Johnson, S., Kaufmann, D., Shleifer, A., Goldman, M. I., & Weitzman, M. L. (1997): The unofficial economy in transition. *Brookings papers on economic activity, 159-239.*

[7] Kaufmann, D., & Kaliberda, A. (1996): Integrating the unofficial economy into the dynamics of post-socialist economies: A framework of analysis and evidence, *World Bank Policy Research Working Paper, (1691).*

[8] Levy Algazi, S. (2007). Productividad, crecimiento y pobreza en México: Qué sigue después de Progresa-Oportunidades?

[9] Losby, J. L., Else, J. F., Kingslow, M. E., Edgcomb, E. L., Malm, E. T., & Kao, V. (2002): Informal economy literature review, *ISED Consulting and Research.*

[10] Maloney, W. F. (2004): Informality revisited, *World development, 32(7), 1159-1178.*

[11] Maurin, A., Sookram S., & Watson, P. Kent (2006): Measuring the size of the hidden economy in Trinidad & Tobago, 1973-1999, *International Economic Journal (2006): 321-341.*

[12] Morduch, J. (1999): Between the Market and State: Can Informal Insurance Patch the Safety Net? *World Bank Research Observer 14: 187-207.*

[13] Perry, G. (Ed.). (2007): Informality: Exit and exclusion. *World Bank Publications.*, ISBN 0-8213-7092-8.

[14] Schneider, F. (1998): Stellt das starke Anwachsen der Schwarzarbeit eine wirtschaftspolitische Herausforderung dar?: einige Gedanken aus volkswirtschaftlicher Sicht.

[15] Schneider, F., & Enste, D. (2000). Shadow Economies Around the World Size, Causes, and Consequences, *IMF Working Papers 00/26, International Monetary Fund.*

[16] Schneider, F. (2014). The shadow economy and shadow labor force: a survey of recent developments, *IZA Discussion Papers 8278, Institute for the Study of Labor (IZA).*

[17] Simon, C. P., Witte, A. D., Eakin, K., Schoettler, R. G., & Ziegert, A. L. (1982): Beating the system: The underground economy, *Boston, Massachusetts: Auburn House Publishing Company.*

[18] Souza, P., & P. Baltar. (1979): Salario minimo e taxa de salarios no Brasil, *Pesquisa e Planejamento Economico 9: 629-60.*

[19] Ulph, D. (2013): Measuring tax complexity, *Office of tax simplification.*