

End of Studies Project

Topic

Shining light on the Shadow Economy in Tunisia

Presented and defended by:

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Supervised by:

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Student belonging to:

BCT

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Introduction

Shadow economy is a very important phenomenon that attracts much attention because of its great influence on official economy growth, public finance safety and labour market demand etc. Although researchers, Central Banks and governments have undertaken intensive efforts and urgent actions to control the development of the shadow economy, it is still a difficult but common economic problem all over the world. Research has shown the existence of the shadow economy. Some of the most recent research was conducted by an IMF economists Medina and Schneider (2017), using a statistical method, have calculated the size of shadow economy in 158 countries during 1992–2016. The obtained results showed that the average size of the shadow economy of these 158 countries over 1992–2016 was 32.5% of official GDP, and it was 34.82% in 1992 and decreased to 30.66% in 2016. Their results showed also that the lowest size which existed in East Asian countries still reached 16.77% over this period, and the highest level which existed in Latin American and Sub-Saharan African countries reached 35%.

So what is the definition of the shadow economy?

The literature uses many definitions of the shadow economy, and agreeing on a precise definition is still difficult. However, most of the economists and researchers can agree on many of the features of what is known as the shadow economy with a focus on slightly different aspects of this phenomenon. A variety of different terms are used in addition to “shadow economy” can be found in the economic literature The terms are: occult, invisible, black, gray, ghost or unofficial, ‘underground economy’, ‘illegal economy’, ‘informal economy’, ‘tax evasion’ which are related to the main phenomenon (shadow economy) that may affect the economic stability and growth. Regardless of how it was called, this economy has been considered by all economists doing business in violation of social norms and economic laws, in order to obtain income that cannot be controlled by the state, thus, evading paying taxes.

Shadow economy-the complex, dynamic and global phenomenon that evolves complementary or contradictory to the formal economy, take on harmful and very serious forms of progress, jeopardizing the economic and social development. A large part of market goods and products comes from the shadow economy. Hence, a large amount of the cash in circulation has their origin in the activities carried out in the shadows. So, we can say that we are living in a world where informal and official economies are tightly interwoven. This correlation exists in most countries in the world and generally has the same causes: inadequate tax systems, regulations, corruption and unemployment etc.

All these considerations emphasized the vitally important role of the computation of the size of the shadow economy and the role of Central Banks, government and citizens to cushion the effects of this tumour. Within the framework of this interrogations, the present investigation broaden current knowledge about the Tunisian shadow economy. The latter arouse widespread concerns especially in last years. In, fact, the Tunisian shadow economy is the highest among African and Middle-east countries.

Tunisia's shadow economy is a phenomenon that did not begin with the 2011 revolution but has in fact existed for a number of years especially at Tunisia's borders where products and goods

(tobacco, oil, drugs and weapons ...) are smuggled across the borders with Libya and Algeria. Moreover, contraband takes many other different forms such as people selling on the streets, people providing tutoring, parallel imports or individuals being employed by a formal company without being issued a contract etc. In Tunisia, such activities and many other forms of activities present a significant part of the Tunisian economy.

Following this insight, we aim to understand the main causes of the shadow economy in Tunisia, its negative impacts in order to define the right tools to fight this tumour. We believe that this issue is a topic of current interest since highlighting the causes and effects of the Tunisian of the shadow economy and estimating its size and its evolution over time would strengthen the economy. Despite the importance and the urgent need to deal with this phenomenon, few are researchers that addressed questions about the causes and the size of the Tunisian shadow economy; hence, our work is considered the pioneer that deals with this phenomenon.

Within this intriguing context, we try to draw the landscape of the Tunisian shadow economy by responding to these following detailed research questions:

- 1) *What are the most influential factors on the development of the shadow economy?*
- 2) *What are the main visible sectors of the shadow economy?*
- 3) *What are the key recommendations and the Central Bank of Tunisia strategies to fight this phenomenon?*

Responding to these questions starts firstly by highlighting the determinants of the amount of currency in circulation (to carry out formal activities and informal ones) by dressing the long run relationship as well as defining the speed of adjustment to ensure the return to equilibrium with its major determinants, secondly to determine the amount of currency in circulation used only for formal transactions; hence, the difference is considered the extra money which is estimated as the illegal.

In order to shed the light on Tunisian shadow economy and get a better understanding of the causes, consequences and solutions related this phenomenon, our study will be outlined as follows.

The first part provides an overview on the shadow economy as a global phenomenon; where the first chapter underlines the motives of the shadow economy activities, its impacts positive and negative ones and the actual trend of carrying out activities in the shadows. Afterwards, in the second chapter we will exhibit the different visible sectors of the shadow economy in Tunisia, and the reasons of their developments.

In the second part, we exhibit the steps of the measurement of the size of the shadow economy in Tunisia, strategies and the recommendations to tackle it. In the first chapter, we propose to expose in detail the empirical literature review which is presented as the background for our empirical analysis. Afterwards, we will conduct the empirical estimation of the size of the shadow economy in Tunisia. In the second chapter we will focus on the Central Bank of Tunisia strategy toward the shadow economy and on the recommendations to tackle tax evasion and then the shadow economy, this tumour that we should cushion its serious impacts.

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DEDICATION

Nobody has been important to me in the pursuit of this journey than my family; I would like to express my heartfelt gratitude to them for their unconditional love and support.

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Chapter 1: Shadow economy: literary review, causes, consequences and new developments

Agreeing on a precise definition of the Shadow Economy is still difficult, the literature uses many definitions that have varied according to author's interpretation. Each author focuses on a different aspect of this phenomenon.

In the economic literature there is a lot of appellation for this type of economy. It was called shadow economy, occult, invisible, black, gray, ghost or unofficial economy. Regardless of how it was called, this economy has been considered by all authors as doing business without respecting social norms and economic laws, aiming to gain profits that escape from government control.

A variety of different terms are used in addition to what we call “shadow economy”. The terms are ‘underground economy’, ‘illegal economy’, ‘informal economy’, ‘tax evasion’... these terms which are related to the main phenomenon of shadow economy may affect the quality of the national accounts’ estimates.

These terms are considered as the components of shadow economy, and each one is defined from a different angle: the fiscal and administrative laws, the penal code and the labour market.

Therefore, they may overlap.

The shadow economy phenomenon with all its components started attracting the attention of economists in the first half of the 1970s. It had also attracted some attention during World War Two. Obviously it had emerged before even though its existence had not attracted attention. Over these years, the debate on the shadow economy has crystallized into four dominant schools of thought because before the creation of modern economies, economic activities were mostly informal and illegal.

The causes that lead to the creation of this phenomenon are several but, for the most part, they can be compressed into four major categories: tax system, labour market institutions, incentives from the financial sector and other institutional and economic incentives. In addition to these causes, four main factors are influencing the development of the shadow economy all over the world (globalization, enhanced international co-operation, developments in technology and criminals increasingly entering the legal business market) which are presenting opportunities and challenges to tax administrations and government as things move into and out of the shadows, changing the nature of some un-observed economy activities.

Five main changes are occurring in shadow economy activity and they can enable such activity, we can mention, the changing patterns in the use of cash, the emergence of new business models and ways of working, areas where technology can be misused, cross-border activity, particularly fraud and the exploitation of workers.

With all these changes, the negative or positive influence of the shadow economy still an ample phenomenon, mainly stated, that the shadow economy has serious consequences that are usually negative, such as inequity, bad effect on the tax system, budgetary pressures and

political decisions based on wrong macroeconomic information. However, on the other hand there are also positive effects as poverty reduction, innovation achievement and the improvement of the competitiveness.

Section1: Literary review

The aim of this section is to review the different definitions of the shadow economy, its components and its origins. It also brings out the differences between the dominant schools of thoughts regarding the definition of the shadow economy.

I. Definition

Agreeing on a precise definition of the shadow economy is still difficult, the literature uses many definitions, ancient definitions and recent definition.

1. Ancient definitions

Most authors trying to calculate the shadow economy still face the difficulty of a precise definition.

James P. Smith (1994) *Senior Economist, RAND Corporation which is an American nonprofit global policy think tank . Dr. Smith was responsible for all research studies at the RAND Corporation that dealt with domestic labor markets, demographic trends in the United States, and economic development in the third world.* defines the shadow economy as ‘market-based production of goods and services, whether legal or illegal, that escapes detection in the official estimates of GDP.

The Oxford Dictionary defines the shadow economy as the “illicit economic activities existing alongside a country’s official economy.” It is the market in which goods and services are traded illegally, to avoid government regulation or taxation. However, not all services and goods traded in the shadow economy are illegal, such as cigarettes or manufactured goods.

According to one frequently used definition, shadow economy comprises all currently unregistered economic activities that would contribute to the officially calculated gross national product if the activities were recorded. This definition is used, for example, by Schneider who is an economist authors **Friedrich Schneider*

Since 1986 Friedrich Schneider is Professor of Economics at Johannes Kepler University of Linz, Austria, and since 2006 he is Research Professor at the DIW Berlin, Germany. He has also been consultant to numerous organisations including the Brussels EU Commission, IMF, World Bank. He has published extensively in leading Economics journals including The American Economic Review, The Quarterly Journal of Economics, The Economic Journal and the Journal of Economic Literature. He has also published numerous book chapters and books including The Shadow Economy (with Dominik H. Enste, Cambridge Uni. Press, 2002), he Economics of the Hidden Economy (editor of 2 volumes, in: Mark Blaug (ed.) The International Library of Critical Writings in Economics, Edward Elgar Publishing Company 2008), Handbook of the Shadow Economy (Edward Elgar Publishing, 2011), and The Shadow Economy (with Colin C. Williams, The Institute of Economic Affairs, 2013). In other words he defines the shadow economy by focusing mainly on the reason of existing of the shadow economy.

“(…) the shadow economy is production of goods and services that are deliberately concealed from public authorities for any of the following reasons:

- To avoid payment of income, value added or other taxes,
- To avoid payment of social security contributions,
- To avoid having to meet certain legal labour market standards, such as minimum wages, maximum working hours, safety standards, etc.; and
- To avoid complying with certain administrative procedures, such as completing statistical questionnaires or administrative forms.”

This definition excludes illegal activities. In this case, we talk about “underground economy” and not “shadow economy” which is not always the case in the literature.

The main arguments in favour of their exclusion are the following:

- In some countries, the national accounts have as main objective measuring the well-being of the society, while, shadow economy activities are considered “bad activities” for the entire economy, in that sense, such activities do not have a contribution to the well-being of the society.
- The lack of accurate data made difficult the measure of illegal activities and thus they should not be taken into account.

2. Recent definition

One of the most important and relatively recent definitions including illegal activities has been provided by the United Nations (UN), the Organization for Economic Cooperation and Development (OECD) and by the European Union (EU):

The Commission uses the term “non-observed economy”, which includes:

- Illegal activities where the parties are willing partners in an economic transaction (drug selling) however, this definition excludes those illegal activities where at least one of the parties is not a willing participant (theft), as they are not economic transactions.
- Hidden and underground activities where the transactions themselves are not against the law, but are unreported.
- Informal activities, where transactions are not recorded (households that occasionally rent rooms, non-registered teaching assistants, etc.)

The main arguments in favour of the inclusion of the illegal activities are the following:

- Distortion of aggregates in national accountancy: it appears when no record of illegal operations are kept, hence distortions may appear in false economic indicators. For example, if the sums that refer to illegal goods and services are not recorded in accounts, the sum for consumption expenses will be underestimated, while the sum for savings will be overestimated.
- Internal coherence of national accounts: national accounts are an integrated, complete system. The information referring to a column cannot be modified or excluded unless this action has repercussions on the information referring to important indicators in other columns.
- Comparability: the information in national accountancy is used to analyze the evolution of a certain economy in time and to compare it with other economies. A valid comparison of the level of economic activity in time is achieved by including the totality of production in accounts, but we should take into consideration that the importance of illegality in economic activity vary from one country to another. If this is not done, discontinuity. The economic information referring to the countries where a high proportion of the active population is involved in illegal activities will be slightly falsified by excluding them.

- Coherence of definitions: the unobserved economy includes undeclared legal activity which must be integrated in national accountancy, it includes also illegal activity not declared out of fiscal reasons. One may operate a distinction between the revenue from an illegal operation (such as selling heroin) and the revenue from a legal operation which further leads to a crime (for example, not declaring revenue).

II. The components of Shadow economy

Underground, illegal and informal activities are terms that are considered as the components of shadow economy, and each one is defined from a different angle.

1. Underground activities

Underground economy includes legal products and services which are not recorded by the government, for the purpose of:

- Tax evasion
- Tax avoidance: to avoid the payment of income, value added or other taxes and the payment of social security contributions.
- Avoid having to meet certain legal standards such as minimum wages, maximum hours, safety or health standards, etc.
- Avoid complying with certain administrative procedures, such as completing statistical questionnaires or other administrative forms.

Examples of underground hidden activities: having children work at night, employing illegal immigrants paying wages far below the minimum wages etc.

2. Illegal production

Illegal production is splitted into two categories:

- Production of goods and services whose sale, distribution or mere possessions is forbidden by law, for example production and distribution of narcotics, extortion, black mail, drug dealing and manufacturing, prostitution, gambling, smuggling, fraud, human trafficking, drug trafficking and weapon trafficking and theft, which do not involve mutual agreement.
- Production activities which are usually legal but become illegal when carried out by unauthorized producers, for example unlicensed medical practitioner, which do not involve mutual agreement.

Both kinds of production are included in the production boundary, because both of them are processes whose output consist of goods and services for which there is an effective market demand. However, illegal production refers to illegality in a strict sense, in other words “acts violating the penal code” and associated with “criminal behavior”, but still, there is not a clear borderline between illegal production and underground production.

3. Informal household and do-it-yourself activities

The informal sector can be broadly described as legal economic activities

- Conducted by individuals, at home or in small enterprises
- Not recorded by the official statistics department (as tax or social security laws, regulations of professional groups etc.) even if they are not intended to escape taxation and government deterrence.
- Typically operated at a low level of organization.

III. Shadow economy Time-Scale

The shadow economy phenomenon started attracting the attention of economists during World War Two and especially in the first half of the 1970s and since then, the debate on the shadow economy has crystallized into four dominant schools of thought.

1. Origins

a. Illegal activities

Illegal activities prosper in most countries during the war. Countries fighting a full-scale war often restrict the domestic use of critical resources needed for the war effort, such as food, gasoline, rubber, minerals, etc., usually through rationing, that's when the illegal market develops to supply regulated goods at exorbitant prices.

In two words, rationing and price controls applied in many countries during World War II encouraged large-scale illegal activities.

As example, during wartime, because of rationing system, farmers have declared fewer domestic animal births to the Ministry of Food than what has actually happened which led to the flourish of the black-market meat.

Another example, in Britain supplies which were from the United State, intended only for use in US army bases that on British land, however it was leaked into the local native British black market.

b. Informal activities

1950s-1960s

It was widely believed that, with a good combination of economic policies and resources, low-income economies could be turned into dynamic, modern economies and petty traders and many casual jobs would be absorbed into the formal economy. This hypothesis was reinforced by the success of the reconstruction of Europe and Japan, as well as by industrial expansion in Europe and North America after World War II.

However, by the mid-1960s, the International Labour Organization (ILO) organized employment missions to various developing countries because optimism about economic growth in those countries began to give way to concerns about widespread unemployment.

1970s

British anthropologist called Keith* Hart is International Director of the Human Economy Programme at the University of Pretoria and lives in Paris with his family. His main research has been on economic anthropology, Africa and the African diaspora. He has taught at numerous universities (including Yale University and the University of Chicago), most significantly at Cambridge where he was director of the African Studies Centre. He has contributed the concept of the informal economy to development studies and has published widely on economic anthropology coined the concept "informal sector" during his study of economic activities among rural migrants in Accra Capital of Ghana, Ghana. He concluded that most migrants were involved in shadow activities that had autonomous capacity for generating incomes.

1980s-1990s

By the 1980s, changes were occurring in advanced capitalist economies, where production was being reorganized into small, decentralized and more flexible economic units. These changes included the informalization of employment where standard jobs transformed into non-standard or atypical jobs, with hourly wages and few benefits.

The informal economy has then became a permanent and a dependent feature of capitalist economies.

Economic crises such as those in Latin America in the 1980s and in Asia in the 1990s have shown that people who lost formal jobs turned to the informal economy for a living. In addition, high inflation often forces households to top up their formal salary with informal wage to earn a living.

During the 1990s, globalization has also contributed to the informalization of the workforce in many sectors and countries.

Recent years

Informal economy has always been a matter of renewed interest all over the world. Partly, this is because the informal economy has not only increased but also expanded in new features and in an unexpected places mainly during the great recession.

It actually represents an important but highly unnoticed share of the global economy and workforce.

In fact, it is noted that the connection between official economy and shadow economy and its contribution to the overall economy has been a matter of recognition considering that supporting the working poor in the shadow economy (illegal activities not included) is important for reducing poverty and inequality, just as supporting working poor women in the informal economy is important for reducing gender inequality.

Informal economy continues then to be a concept that triggers policymakers, researchers and activists although their interest is a permanent increase and decrease mainly due to the interesting fact that there is a large proportion of the global workforce and production outside the full-time and stable and guaranteed jobs.

2. Dominant schools of thoughts

The debates between these dominant schools of thought have tended to generate more heat than light in large part because each has focused on a “slice of the (informal economy) pie,” not the whole pie. In developing countries, the four schools of thought regarding the shadow economy are:

- The dualist school: it considers the shadow economy as a separate economic sector that is distinct from and not related to the formal economy and that provides income for the poor and a safety net in times of crisis.
- The structuralist school: it considers the shadow economy as subordinated economic sector, in other words, it considers that the relationship between formal and informal economy is under the form of a dominant economy and a subordinate one (informal enterprises and workers working to reduce labor costs of capital companies)
- The legalist school: it considers the shadow economy as comprised of lucky businessmen who choose to operate in the shadows in order to avoid the burdensome costs, time bureaucracy of formal registration etc.
- The voluntarist school: It considers the shadow economy as a bunch of entrepreneurs who choose to operate in the shadows in order to avoid taxation, unnecessary commercial regulations, rental fees, and other costs of operating formally.
- The illegal/underground school: it considers the shadow economy as an illegal/underground economy. The System of National Accounts (SNA)* *The System of National Accounts (SNA) is the internationally agreed standard set of recommendations on how to compile measures of economic activity. The SNA describes a coherent, consistent and integrated set of macroeconomic accounts in the context of a set of internationally agreed concepts, definitions, classifications and accounting rules* assumes that illegal economy is those activities which are forbidden by law or which become illegal when carried out by unauthorized producers, however, the underground economy is legal when performed in compliance with regulations, but are deliberately concealed from the authority.

Section 2: Shadow Economy: Causes, consequences and new developments

The aim of this section is to review the main causes, consequences of the shadow economy, new ways of working in shadows as well as new developments of this phenomenon that lead to its rapid growth and prosperity.

I. Causes of the shadow economy

The causes that lead to the creation of a shadow economy are several but, for the most part, they can be compressed into four major categories: tax system, labour market institutions, incentives from the financial sector and other institutional and economic incentives.

1. Causes rooted in the tax system

High tax rates and social security contributions

Fiscal pressure and the increase of contributions for social securities are major factors for the development of shadow economic activities. They increase the opportunity cost of legal economic activities and reduce work profitability in the official sector.

The higher is the difference between the total work cost in the official sector and the after tax income, the higher is the desire to avoid this difference and work on the shadow sector.

The efficiency of the tax administration in collecting taxes

Collecting tax inefficiently and being unequal are also an important causes of the shadow economy, in other words that greater probability of detecting tax evaders leads to a reduction in the shadow economy.

The probability of sanctions

The probability of sanctions where evasion is detected also affects the extent of the shadow economy. Even with a perfect broad body of regulations that includes rules on tax evasion's penalties can be an inefficient tool for attacking the shadow economy due to corruption, poor co-ordination between the Tax Administration and other government bodies, and lack of willingness on the part of the judiciary to address cases of tax evasion.

The Fairness of the Tax System

The lack of fairness in taxation is a major driver of tax avoidance because, normally, a fair tax system treats companies with same financial strength with similar tax burdens. However, in certain tax systems, such fairness is often absent. Personal income from various sources is taxed differently, as a consequence individuals with high income from capital are taxed at a lower rate than those with high income from work. In addition, there are many tax breaks and tax cuts available to business entities so that entities in different segments pay different levels of tax on the same amount of profit.

Tax compliance costs

The benefits of not paying tax and tax compliance costs (time and money) will increase with the level of those costs. When those costs associated with declaring and paying taxes are high due to complicated procedures, taxpayers are more motivated to operate in the shadow sector. Accordingly, it's obvious that high tax compliance costs can be a major reason for the increase in the shadow economy.

Difficulty of complying

In some countries, it is difficult to comply with tax law, for example difficulties in registering for tax or in understanding tax liability, this difficulty of complying can influence taxpayer behavior. Hence, this can be a major driver of the shadow economy.

2. Labour market institutions as an incentive to the shadow economy

Working hours

The Labour Law stipulates rules governing working hours which covers rules on the length of full-time, part-time, and shortened working hours, overtime and work on holidays, annual leave, maternity leave, etc.

If rules are generous to workers (shorter working week...) this can be a great cost to employers and a great incentive for them to partially or fully rely on informal workers because in this case they can deny legal rights. Thus, they can extend the working hours of their employees, both formal and informal, without reimbursement for overtime and they can ignore statutory paid leave periods.

3. Other institutional and economic causes of the shadow economy

High levels of corruption

Political or bureaucratic corruption is considered a troublesome area because it tends to encourage tax avoidance and tax evasion. In fact, it can generate financial gains to those who engage in corrupt activities, in other words, it can be used for personal needs instead of financing adequately the public sector

In addition, the payment of bribes to some public officials (not all of them) can distort for example the price of a public investment. It can also change misreport some of the official prices of products sold in the market. It's obvious now that high levels of corruption remain an unsettled area.

Tax morality

Low detection rates of tax evasion and wide dissatisfaction with the fairness of the tax system can lead to low tax morale which is considered as a major drive of the shadow economy.

In addition, it often happens that people find it very easy to justify their low tax morale because their family and friends do the same. In other words, if there is high trust in tax administration and government bodies and if individuals have a positive attitude towards fiscal regulations, then the result will be a decrease of the desire to be work in shadow economic activities.

Quality of public institutions

The quality of public institutions is one of the key factors of the development of the shadow economic activities.

In fact, corruption of bureaucracy and government officials seems to be associated with larger unofficial activity. Thus, efficiency of the application of tax systems by tax administrations and regulations by government are important to fight unofficial activities. In other words, a bad quality of these public institutions will promote shadow activities.

Low Productivity

In fact, when the productivity of businesses (value added per worker) is low and their production expenses are high coupled with other factors, causes a vicious circle in which low productivity makes business entities turn to the shadow sector, which, decreases productivity

further. In this case, those business entities can survive only if they fail to comply with their tax obligations, either wholly or partially.

Unemployment

The unemployed individuals with few opportunities to find employment in the formal sector, heads towards shadow economic activities that does not include the payment of taxes and contributions on their wages (nor the rights arising from the payment of such dues). Hence, the higher the unemployment quota, the higher the incentive to work in the shadow economy.

Increased regulation

Too many rules and regulations is another cause of the rise of shadow economy. Although the regulations on the labour market that protect the workers have positive effects in the long run.

The increase of the regulations often leads to:

- Higher bureaucratic expenses both for individuals and for public authorities.
- A limitation of personal freedom.

These supplemental costs are an incentive for working in the informal sector. Examples of increased labor market regulations, there is trade barriers, labor restrictions for immigrants which is another important factor that reduces the freedom (of choice) for individuals engaged in the official economy. It's clear then that regulation is correlated with a larger shadow economy.

Prohibitions

Some activities are prohibited in some countries while they may be allowed in others. They are special forms of regulations so that are classified under the category of regulation. Prostitution is a classic example. They can play an important role in pushing people and resources off the official economic track. There are some operation that are forbidden so that those who engage in them are engaging in illegal or even criminal activities.

The reason of their engagement is the output of these operation that are in great demand so that high profits can be made operating in them. In a private cost benefit evaluation, those who engage in them determine that the benefits in the form of potential high profits exceed the costs that include the probability of being caught and being punished.

Major forms of these activities are the production and distribution of illegal drugs, engaging in illegal gambling, lending of money at usury rates, the production and sale of dangerous or forbidden substances (weapons, prohibited biological substances, and others), various services, including prostitution, and others.

In fact, it's important to note that some countries allow at least some of them, while others forbid them. For example Germany allows prostitution and the German tax authorities expects prostitutes to report fully their "incomes" and pay taxes on them. The Netherlands allows the sales and the consumption of some drugs that are illegal elsewhere. In both of these countries those activities are counted in the countries' national incomes. Thus, important questions are raised by prohibition and criminal activities for the definition and the measurement of the shadow economy. Because of the large estimates of these activities, their inclusion or exclusion can make a significant difference to that measurement.

4. Incentives from the financial sector

Cash transactions

Cash is considered as a means that enables informal transactions because it involves off-account payments that often occur informally. Generally speaking, countries where electronic payments is more widespread see substantially lower volumes of shadow economy.

Informal finance

In developing countries, informal finance is a phenomenon that is coupled with the large extent of the shadow economy. Its existence is caused by market entry barriers, expensive formal financing sources and lack of finance products that meet beneficiaries' needs, etc. However, informal finance has a negative effect on the development of the financial sector and the efficient allocation of financial resources. It's then, in the interest of economic policymakers to prevent informal financing channels along with efforts in tackling the shadow economy, and to boost financing through formal channels.

It's also important to note, that the main drivers for non-violent crimes, sometimes referred to as "white collar crimes" and for violent crimes, such as trafficking of people or drugs, robberies and organized crime are large potential financial benefits.

II. Shadow Economy's effects: Risks and "benefits"

The shadow economy has serious consequences that are usually negative, such as budgetary pressures, wrong macroeconomic information and others, on the other hand there are also positive effects as poverty reduction...

1. Risks

Serious consequences can arise from the existence of the shadow economy. We shall list some of the main ones.

a. Fiscal and social issues

Effects on the tax system

The shadow economy has implications for the tax system. When an important part of the economy of a country digs into the shadow and, thus, does not meet its tax obligations, but still uses government services, the results are:

- Government forced to raise the tax rates on those who pay the taxes, making their existence even more difficult.
- Less neutral tax system which imposes additional distortions on the economy.
- Less tax revenue and thus macroeconomic difficulties.

Inequity

There are a lot of possibilities to avoid payment of taxes both by companies and by people with high income. Consequences of this asymmetrical distribution of chances are:

- People from the "middle" class going towards the illegal activities that are the only possibility of avoiding taxation.
- An unfair economic system because in spite of the fact that all of these individuals benefit from government services, there is some individuals buying goods and services at prices that fully reflect the taxes imposed by the government while other may buy similar but cheaper goods or services produced by the shadow economy.
- An unfair competition because sellers who operate in the official economy pay taxes while those who operate in the shadow economy do not.

A weak labour market

Employers and employees working in the shadow economy are facing:

- A lower level of labour organization

- A poor access to public infrastructure and benefits.

Regarding employees, they become highly vulnerable to harassment and abuse because employers can take advantage of the absence of formal contracts by not complying with government standards, such as ensuring adequate working conditions and paying the minimum wage.

The need to remove barriers to a more efficient, stronger shadow economy

Many individuals/companies working in the shadow suffer from a lack of:

- Access to formal credit as well as
- Inadequate market information, infrastructure,
- Government support and a weak legal system.

As a result, the shadow economy businesses who lack access to public institutions for social protection against crime, will be forced to turn to illegal businesses, mafia protection and illegal loan sharks for support thus an increase in crime, even when the original enterprise is a perfectly legal activity which can weaken the efficiency of the shadow economy.

The most vivid example comes from Ethiopia, where most traders have little access to credit and rely on informal price negotiation and contract enforcement. As a result, some 30 to 55 per cent of the traders reported that they were victims of contract violations.

b. Financial issues

Budgetary pressures

The shadow economy is an often discussed topic. For the reasons set forth below, in periods of crisis when it's difficult to balance the budget, the interest in the financial consequences of the shadow economy on government budget becomes greater:

- If the potential loss of taxes and social contributions are at the income side (because there are no state interventions and this gives freedom to the consumer and to flexible prices) then, the misuse and improper use of social benefits and subsidies are at the expenditure side.
- One may say that shadow economy has the “perfect” conditions for an optimum allocation of resources, being the cheapest alternative for small businesses, which may offer their products for a lower price due to tax evasion. Consequently, in the long run it leads to pressures on public finance.

c. Political and economic issue

Economic growth

The shadow economy can adversely affect legal economy activity by degrading the quality of economic and social institutions, impacting negatively the provision of public goods, etc.

Political decisions based on wrong macroeconomic information (GNP, Inflation...)

The development of the shadow economy distorts the economic indicators in the official statistics may lead to promote policies that may not be the ones that a country needs and it may affect a country's international standing.

- An incorrect GNP, which may be growing faster than the statistics indicate
- An exaggerated unemployment rate, when many so called unemployed may in fact be working in shadow activities,

- High rates of inflation, if prices in the shadow economy increase slower than in the official economy. Etc.

Effect on Foreign direct investment

A large shadow economy may also discourage foreign direct investment into a country because FDI generally is often affiliated with taxed activities. This may force the government to compensate the foreign enterprises for the high tax rates with more generous tax incentives. This, in turn, may create other distortions and economic problems.

2. “Benefits”

Some governments are beginning to become more aware of the vital role the IE plays, especially for the most vulnerable. Because of this awareness, some now look to policies that support the IE to become more productive, provide a better voice in governance and a better quality of life for those dependent on it.

a. Engine for poverty reduction

Due to its flexible nature, the shadow economy (except illegal activities) is in some ways better able to adapt to difficulties such as the current global recession, providing some measure of support to those most in need, in other words it is :

- A key route to promote gender equality and empowering women.
- In developed countries, it predominates as a livelihood activity for poorer people.
- In developing countries, it predominates for people in poor urban and rural areas, and farmers.
- A solution when formal labour markets have not been able to generate sufficient jobs to absorb a continuously growing workforce, particularly for unskilled labour.

b. Engine of several competitive advantages

Shadow economy (except illegal activities) is not bound by the same restrictions as the official economy (tax evasion, non-compliance with regulations, such as minimum wage).

As a result there are lower barriers to entry. Thus, companies working in shadows can, potentially, gain a competitive advantage over formal, registered companies.

These low barriers to entry also allow many people to join the informal economy as a survival strategy in times of poverty and disaster.

c. Engine of innovation

Most governments have discouraged the shadow sector (except illegal sector) because it encourages individuals to adopt survival tactics such as casual jobs, temporary jobs, unpaid jobs, subsistence agriculture, tax evasion, avoidance of labour regulation and other government or institutional regulations, unregistered companies. Those survival tactics stimulate competition, an efficient production, and promotion of innovation.

Furthermore, working on the shadow economy (except illegal economy) is linked to a certain degree of enthusiasm. There are a lot of individuals who are enthusiastic, have initiative and take risks to find some niche for their products on the informal market where technical innovations can be easily achieved (new products, improve existing ones, make valuable use of resources and tap into new and international markets).

III. Recent developments in the shadow economy

Five main changes are occurring in shadow economy activity, we can mention: the changing patterns in the use of cash, the emergence of new ways of working, areas where technology can be misused, cross-border activity, fraud and the exploitation of workers.

1. Cash – still king?

The use of technology, in particular the rise of internet and telephone banking, contactless cards and mobile applications as well as the significant growth in online shopping, seems to be having a strong trend impact on the use of cash. This has led to a reduction in many countries in the use of cash for recorded transactions.

In Sweden cash transactions made up barely 2% of the value of all payments in 2015.

In the United Kingdom the number of recorded payments made in cash fell by 15% between 2015 and 2016.

The majority of large payments are made electronically, including as a result of the physical difficulty of making large payments by cash and the vulnerability of holding large amounts. However, contrary to predictions of the imminent demise of cash, the demand for cash in the form of bank notes has recently been growing in the vast majority of countries. It is estimated that there are over 500 billion banknotes in circulation globally.

In that sense, it's obvious that cash is still king, in other words there is an increase in demand (especially for high denomination notes) attributed to its function as a store of value and its untraceable nature to a particular individual or transaction.

In fact, antimoney laundering rules require financial institutions to report suspicious transactions and transactions over a certain amount, but smaller transactions or those taking place outside of the banking system will often be entirely untraceable and invisible.

As a result, cash continues to be used to facilitate shadow economic activities, whether in paying traders, employees or in carrying out illegal activity.

2. The sharing and gig economy

The terms sharing and gig economy are often used interchangeably because while the first tends to be concerned more with physical assets and the second with labour, labour and assets are frequently used in combination.

a. The core idea behind the sharing and gig economy

The sharing economy, it is that value can be extracted from “sharing” assets which may otherwise be unused - for example, a spare bedroom, a parking space or a car. Where this activity involves payment rather than cost contribution (for example contributing to petrol costs in a shared ride), then there can be taxable consequences. This activity has gone on in the past although usually on a very small scale.

One reason for this, is that in the past advertising such assets widely was difficult and there were issues of trust on the side of the provider – for example entrusting your house to a stranger – and also on the side of the customer – protection from fraud, insurance coverage and so on. The new online intermediaries have rapidly expanded the sharing market by providing mechanisms to assure trust (insurance, ratings, complaints procedures, funds held in escrow, etc.) and making the assets visible to large numbers of people combined with ease and security of use.

The gig economy, it is the unbundling of specific tasks which can be performed at specific times allowing suppliers and purchasers of labour to transact in a cost-efficient way without a traditional intermediary employer.

For example:

- Taxi drivers: whereas in the past taxi drivers were often employed or on contract to a particular employer, new technology allows the customer to connect directly via an online intermediary.
- One-off deliveries, meal services, childcare services etc.: Now, the online intermediary is able to provide mechanisms to assure trust and advertise the services widely.

b. The emergence of the sharing and gig economies

They can have strong positive impacts on the economy, providing new markets for physical assets and labour, increasing market efficiency, lowering prices and providing more choice. However, the new business models do raise a number of tax issues:

First, there may be uncertainty among some providers of labour or assets as to what their tax liabilities are. As a result some may not be aware that they may be liable for tax and therefore may not report this source of income.

The second issue is that since there is usually no traditional employer, payments received will not generally be visible to the tax administrations in the way, for example, that they are for salaried employees in many countries.

Third, as regards tax collection, the online intermediary itself may not be located in the same jurisdiction as the person who receives the end payment, and therefore it may be difficult to get information, in particular if sufficient details are not contained on the site itself. In addition some online intermediaries may structure themselves, or interact with clients in a way that such anonymity is seen as part of the “package” (some tax administrations report seeing some such cases).

Although these new business models do not yet have a significant share of economic activity, they are already having wider influences on the provision of goods and services and many experts estimate that revenue will grow rapidly from the low tens of billions today to hundreds of billions over the next ten years.

3. Misuse of technology

While the use of technology can enhance the visibility of the shadow economy, it can also be misused to create false data. Tax administrations providing input to this project noted that two of the most commonly observed facilitators of shadow economy activity were the use of **fictitious invoices/receipts** and **identity fraud**. In addition, even though more transactions are now being recorded electronically, such electronic records can themselves be vulnerable.

a- Fictitious invoices and receipts

Fictitious invoices and receipts have long been used in the shadow economy because they have always been relatively easy to produce. They are used either to:

- Reduce taxable revenues: A receipt can be issued for goods or services which under-records the actual amounts received.
- Inflate deductible costs: This can be done by recording an inflated cost of goods or services supplied to the company or an entirely fake purchase. As well as reducing costs this can also be utilized in fraudulent claims for refunds of VAT on goods or services, including those never purchased.

Nowadays, the difference is that these can be indistinguishable from real invoices as a result of computers and online services. It is also easier, and less costly, to provide what can look like legitimate trails for false invoices through fake websites. In addition, high quality fake receipts can also be relatively simple to obtain. (Typing “buy fake receipts” into a web browser shows a large number of sites producing fake receipts for downloading or receiving by post.)

b- Identity fraud

Identity (ID) fraud is becoming more common as vulnerabilities can be exploited more easily and at greater scale than before by obtaining personal data from the internet and through the ability to produce high-quality forgeries using new printers and scanners.

For example, phishing emails which trick people into revealing personal information themselves or through the installation of spyware programmes, accessing and mining unprotected social media etc.

In addition, ID fraud facilitates tax crimes (such as obtaining refunds due to the real taxpayer by changing taxpayers' bank details) and it can be used to facilitate shadow economic activities in order to:

- Set up fake companies, facilitating invoice frauds and false VAT refunds;
- Create “phoenix businesses” which are closed prior to tax having been paid and where fake ownership makes it difficult to collect debts;
- Obtain licenses from regulatory authorities while avoiding being visible to tax administrations;
- Claim benefits or other government payments under one ID while working under another.

4. Sales suppression

Sales suppression traditionally was in the form of some payments being “off books”, usually carried out through receiving cash payments without recording the transaction and often without there being a legitimate receipt. However, due to:

- The increased customer demand for receipts,
- The protection that comes with them (for example in the ability to return goods) and,
- The increased use of electronic payments

Some businesses are now providing receipts but are in parallel seeking other means to take some payments “off books” through the use of specialised software or devices.

5. The rise of the cross border shadow economy

Tax administrations report increasing difficulty in dealing with the range of issues that arise through personal and corporate taxpayers trading and earning income internationally.

They note concerns about the adequacy of domestic laws and regulations to deal with the range of issues that have tax consequences inside their borders, but that are occurring where their laws and regulations are unenforceable. In addition increasingly the integration of processes and systems across borders can enable fraudulent activity to operate in time-scales far faster (including real time) than cross-border co-operation can currently operate.

Examples of cross border shadow economy activity increasingly seen by tax administrations are:

a. VAT carousel fraud

In the carousel or VAT fraud, a fraudster import goods VAT-free. He sells the goods to a company controlled by an accomplice and charges him the VAT tax. The goods are then sold through a series of companies, each liable to VAT, and finally exported.

The first link in the chain always disappears. He vanishes with the VAT that he has charged to his customer and that he should report and transfer to the tax agency. The final link also disappears but not before he has reclaimed the VAT it has paid from the tax agency.

The criminals have then to invest money, create companies and execute a series of transactions in a short amount of time to be successful. As a result, the added ‘benefit’ of this fraud is then hard to prove and even harder to detect before the criminals vanished.

b. Cross-border traders

As barriers to cross-border transactions have generally reduced, they have offered new opportunities for shadow economy activity through distance selling.

Distance selling is the use of internet based online intermediaries to sell cross-border. Some users of such online intermediaries will sell without VAT or appropriate customs duties being paid.

In addition, due to the large volume of world trade and the rapid growth of e-commerce, illegal trafficking of counterfeit or pirated goods are now easier. These illegal goods, cover a wide range of products from luxury goods, to intermediate goods and mass consumer goods such as food, medicine and toys.

c. Illegal work

Illegal employment and shadow economy are closely connected due to the fact that they both entail tax avoidance and non-respect for regulation.

In addition, people in vulnerable situations (illegal employment) are more exposed to being used by organised criminals or fraudsters who can proceed with false corporate registrations, misuse of identities and the illegal trade in work permits.

Amongst the most vulnerable groups, migrants are likely to be found at risk of labour market exploitation. However, it is important to distinguish illegal employment of migrant workers from informal employment, as illegal employment of foreign workers may also be found in formal economy while informal employment may not necessarily involve migrant workers.

Hence, illegal employment of foreign workers, needs to be addressed as a source of concerns for migration policy perspective (possibility of working illegally likely to be a key pull factor for irregular migration, stigma and backlash against migration in general), for human, social and ethical arguments (migrants workers at risk of exploitation, with their fundamental rights violated) and for economic reasons (lost revenues for the State, social dumping, etc.)

Conclusion

All definitions ancient and recent ones suffer from flaws. However, the recent definition, although imperfect like any other, presents certain advantages in thinking about shrinking the shadow economy. It recognizes that some forms of the shadow economy activities may be recorded outside of the tax administration which shows that it can exist within a legal business if there is not full reporting and it can englobe the criminal activities as well. Thus each form present a component of the shadow economy which has its proper characteristics that make it different from the other components, we have unrecorded activities, unreported activities and illegal ones. Thus, a great common understanding of the components of the shadow economy can contribute to the construction of a comprehensive strategies and tools in order to tackle them.

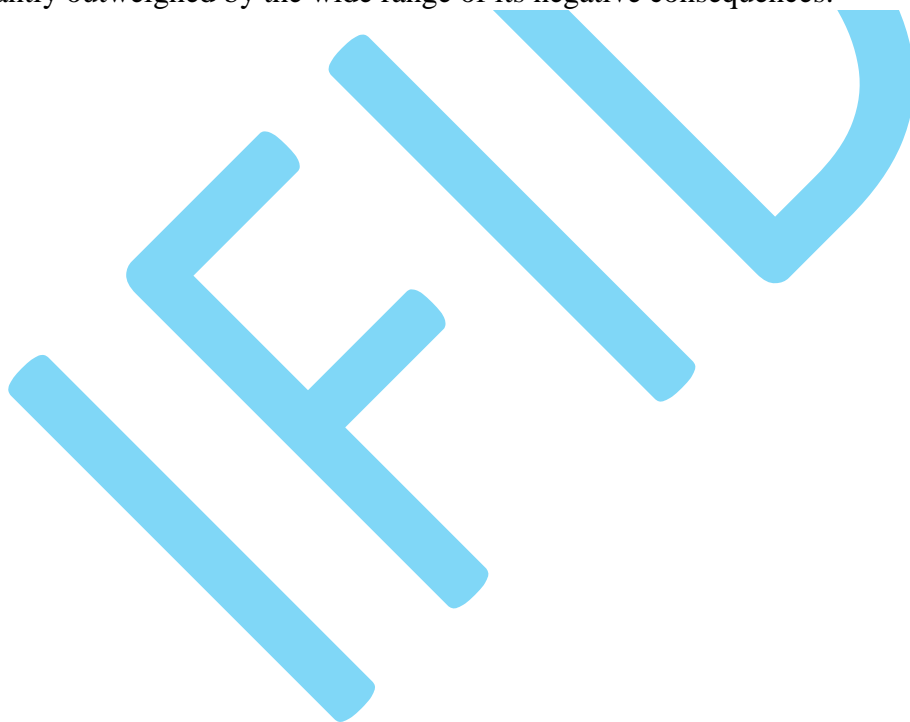
In this context, we note that people tend to forget that before the existence of modern economies, shadow economy was the norm and not the exception and the debate on it was presented under five schools of thought. Clearly, the dualist school focus on workers/businessmen engaged in traditional and survival activities, the structuralists focus on small traders as well as sub-

contracted workers, both the legalists and voluntarists focus on informal entrepreneurs and small companies and the other school of thought focus on illegal and underground activities.

Despite the differences of these school of thoughts, the common idea is that the shadow economy does not happen by accident. It is considered as a consequence of imperfections in the economic system and inadequacies in economic policy. While the key factors that generate and foster the growth of an unobserved shadow economy are many and complex, the most important ones are: excessive tax burden, government over-regulation of business, unemployment, cash transactions and high level of corruption

In fact, the shadow economy is constantly changing and adapting. In particular recent changes in forms of business, technology progress, and globalisation are causing new shadow economy activities to exist and some existing ones to expand. These can generate new problems such as an increased cross-border frauds, a rise of sophisticated use of technology and new threats to the tax base because of the rapid growth of the new business models.

It's then quite obvious that even though that the shadow economy may have some benefits, it is significantly outweighed by the wide range of its negative consequences.



CHAPTER 2: Overview of the shadow economy in Tunisia

How is the Tunisian economy doing today?

After an IMF mission to Tunisia, a press conference held Wednesday, July 17, 2019 gave indications to see a little clearer in terms of macroeconomic policy good points, but also failures and even risks. In the presence of Bjorn Rother IMF Mission Chief for Tunisia, Mr. Marouane

Abassi Governor of the CBT noted the efforts to develop the decashing and electronic payments and it was an opportunity to note that between three and four billion dinars are outside the official circuit.

According to Mr. Marouane Abassi the governor of the Tunisian Central Bank, there are actually three forms of shadow sectors. The first, and probably the best known, is the street traders that everyone meets in the corners of the streets. The second is cross-border trade and the third is illicit trade, the latter is linked to contraband and mafia networks. This is by far the most important.

The shadow economy in Tunisia includes three axes: street trade, smuggling goods and parallel imports, micro-enterprises and small trades, illicit trade and even frippery. All of this deprives the state coffers of important tax revenue, including:

Income tax on corporations	← Tax evasion
Tax receipts on wages	← Informal employment
VAT receipts	← Goods without invoices
Customs revenue	← Smuggling and fraud, and
Consumption rights	← Tobacco and oil products.

As a consequence, those axes represent threats to the post-revolutionary Tunisian state which we are trying to change for the better.

The causes that lead to the emergence of Tunisia's shadow economy with its three axes are several, they can be compressed into three major categories: economic causes (price differences...), fiscal and legislative causes, social causes (corruption...), external cause such as a bad education system, the use of cash and the financial exclusion. Thus, it affects the growth of GDP rate and the volume of the formal trade between countries in the Maghreb. That's why it's necessary to implement strategies and to use the right tools in order to weaken the effect of the shadow economy on the GDP rate.

How each of these major categories has contributed to the shadow economy is showed below.

Section 1: Overview on the visible sectors of the shadow economy

The aim of this section is to study the shadow economy in Tunisia including these following axes: smuggling goods and cash, small trades, street trade, parallel imports, illicit trade and frippery.

I. Smuggling dilemma

1. Definition and effects

Smuggling is a central phenomenon that dates back to the mid-1990s when free trade with Europe and the resulting prosperity of the "Trabelsi clan" imply the forgiveness of "laissez-faire" for small people, for example the emergence of "Libyan souks" in almost every city. This is a recognized and tolerated social valve which is leading to the massive destruction of the organized economy.

A whole series of distribution chains have therefore been set up in an informal way with the bottom of the chain (retailers) perfectly visible and paying higher wages than those practiced in the formal sector while the top of the chain remains invisible.

As a Consequence, the labor market is in crisis in all the governorates where smuggling prevailed, because the wages have to align with the incomes of contraband, otherwise the employers will not find labor accepting market wage rates.

In addition, this is a phenomenon that fuels arms trafficking and religious extremism. It is also symptomatic to note that it was during this same period of the 1990s that smuggling and distribution networks nourishing Islamism, are set up in Algeria.

The risk is then that the entire organized economy is infected.

Nowadays, smuggling represent a significant percentage of the country's economy. In terms of volume, the four most important product families are tobacco, petroleum products, clothing and finally household appliances and electronic products.

2. Stimulus for smuggling different goods

- Tobacco smuggling: The national tobacco supply (domestic production and legal imports) has a deficit that is difficult to understand and does not meet the needs of the internal market. Smuggling, mainly from Algeria and Libya, fills the gap and accounts for nearly a third of national tobacco consumption. This poses public health problems and causes revenue losses for the state.
- Smuggling of petroleum products: this comes from the large price differences between Tunisia and its Algerian neighbors and Libya and therefore can be dealt with effectively only through a joint strategy developed with the authorities of these two countries
- Smuggling of other products except tobacco and petroleum products: differences in import taxes and subsidies, leading to significant price differences between Libya and Tunisia on the one hand and Algeria and Tunisia on the other. *Joussour 2016*
- Criminal organizations smuggle bulk cash to keep their proceeds and related activities away from the scrutiny of financial regulators and law enforcement agencies. Bulk cash smuggling damages our economy by removing billions of dollars from the commerce of the United States. Those dollars could otherwise be used to purchase goods, pay taxes, or invest in lawful enterprises.

It also diminishes the integrity of our financial system by promoting an unregulated, unreported and underground market for illicit goods and services. It fuels criminal enterprises that traffic in illicit drugs, engage in violent crime against persons and property, fund terrorism and extremist groups, engage in human trafficking and smuggling and commit commercial fraud.

- Parallel imports: Other sources to supply the parallel market: Finally, a large flow of products from the shuttle trade, non-taxable imports from Tunisians living abroad, illegal imports and products sold without official company bills. This inflow is estimated at between 2 and 3 billion dinars in the selling price and generates revenues of 500 million dinars.

This smuggling represents a significant percentage of the local market and therefore a factor in improving the purchasing power of many Tunisian consumers, but it also generates significant annual income for a few dozen barons and wholesalers on both sides of the border, with real risks of interference with organized crime and infiltration by terrorist groups.

3. External stimulus : “The border regions”

Since independence, Tunisia, Libya and Algeria have prioritized economic development and investment in their coastal centers, leaving vast interior regions and borderlands neglected and marginalized. While largely uninterested in fostering economic opportunities in borderlands, Tunisia has nonetheless sought to limit the risk of instability in those regions. For this reason, and also to provide some additional income for politically connected elites “Trabelsi” family, our state has tolerated alternative forms of income generation in the borderlands, particularly smuggling, networks trading in contraband gasoline, foodstuffs, textiles, or electronics...

Although the region’s borderlands can appear uncontrolled and chaotic, with government officials either ignoring or actively involved in the activity, limited enforcement never meant that the state had relinquished control. In fact, large sections of the smuggling trade were conducted through border crossings under the watchful eye of security officials because of bribery or because of mafias who threaten the authorities, smugglers who are often armed so customs officers do not stop the trucks, and tractors bypass customs posts on a route through the dunes.

Since the 2011, uprisings governments in North Africa have begun to primarily view their borders as a security challenge. Conflict in Libya and northern Mali led to a boom in arms smuggling and drug trafficking across the region and opened space for militant groups to flourish and stage attacks on Tunisia and Algeria, thus, porous frontiers came to be seen as a cause and an indication of an increasing of illegal economy as well as a source of instability and vulnerability in the region.

Since early 2019, The acute risk of political instability has been growing steadily in Algeria and because of that, Algeria’s economy is also stagnating and analysts predict an increase in unemployment in 2019 and continuing economic stagnation could lead to further instability in Algeria that would have significant ramifications for Tunisia (increasing in the employment rate) counterterrorism interests and regional stability. Therefore, informal trade surge would have more chance to be contained whenever a political agreement is reached.

II. Street trade and small trades

1. Street trade

Street trade is an increasingly important component of urban informal economies, and a crucial livelihood strategy for the poor and very poor, it provides a key source of new jobs, and supports significant urban-to-rural and international remittances.

It is also one of the most visible and contested sectors of the shadow economy with public space as a place of work subject to frequent police crackdowns.

Yet, far from the common perception that street trade is a survivalist outlet for local produce or manufacturing, the informality is seen as a response to over-regulation and an entirely rational reaction to today’s economic, cultural and social world, with traders now inextricably linked to global systems of exchange.

Till now, the main trade unions had been hostile to street traders, considering them “bandits” because a high per cent of traders had no patent (licence).

In fact, after the revolution, UTICA had launched a dialogue with informal economy operators because a complex system of payments and protection was operating, before the revolution, with police and municipality officers extracting payments and bribes, but also providing some protection from evictions. The process was quite straightforward, street traders paid a small

amount to established vendors to negotiate with the authorities without arresting them. Established vendors then made the negotiations with the authorities. Thus, security forces protected them against conflicts and violence and traders could keep their place.

The Tunisian revolution in 2011, sparked because of the neglected rural areas and neglected areas in the capital. While the spark that lit the protest was outraged because of the death of Mohammed Bouazizi on 4 January 2011, was also outraged because of the main grievances concerning repression, corruption, economic difficulties and lack of political freedoms.

After the revolution, the impact of the revolution and the resistance of traders were explored from various angles, including: the reaction of traders to the growing number of new arrivals on street trade, the changing role of authorities and the evolution of insecurity and harassment. In fact, since the revolution, a rapid increase of newcomers is noticed, mainly young men, some were hostile, reporting competition if newcomers were selling the same product, “noise and anarchy” in the souk, and a “lack of security in the chaos”, however, there is some who were more sympathetic, saying that “we are all poor” and treated each other with respect.

2. Micro-enterprises and small trades

This informal sector is a vast domain largely beyond the control of the state. It contributes significantly to Tunisia's growth and acts as a shock absorber in times of crisis, but since 2008 it has grown faster than GDP which is a real concern. While tackling the informal sector that should remove some aspects, it will be necessarily to use the accompanying policies to increase productivity and policies to protect the people who work there for certain tasks so that they can operate in decent conditions.

Anarchic importation of Tunisians residing abroad

It is important to note that the informal sector is also well interconnected with the formal economy, as a large number of smuggled products are sold in regular commercial shops in around the country (clothes, make ups etc)

Manufacturing industry

This is a sub-sector in which the weight of the informal sector is the weakest. Given its size and strengths, this sector can, in the short term, play the role of driving Tunisia's development and formal employment (it already accounts for almost half of private sector employees)

Building and civil engineering sector

The sub-sector is the largest informal sector. The disproportion, in terms of official figures, between the sector's share of total employment and its share in the GDP indicates possibilities of great money evasion (money laundering, sales without invoices ...). All this makes this subsector a priority area of investigation for the INS.

III. Illicit trades

1. Illegal weapons trade, drug trade and human trafficking

Shadow economy is a concept encompassing various illegal activities which need money laundering to help processing proceeds from illegal activities and re-entering them into formal economy. The big three illegal activities are illegal weapons trade, illicit drug trade and human trafficking and prostitution and the indispensable tools of those activities are money laundering. Illegal trade with weapons and small arms is one of the sources of money in the shadow economy. The illegal trade has the most impact on the world we live in. Weapons are the focus of every

armed conflict. Up until recently, there weren't many conflicts in the world where nations faced each other directly.

Most of the conflicts were internal and limited to countries or non-governmental groups, such as rebels, armed opposition and various religious groups, operating across state boundaries.

Many of these conflicts were classified by the international community as civil wars. These would be conflicts between different factions or against state actors. If we consider state actors, such as regular national army or regional militias are legally organized and armed, any other actor in these conflicts would, naturally by definition, obtain and use their illegal weapons.

Illegal drugs are another big global problem. There are many types of substances commonly known as drugs, and almost all are classified illegal in most of legal systems around the world. This makes it a very popular product, produced in many different places in the world. Yet, once again there is a significant need for money laundering to support the illegal drug trade and trafficking.

IV. Frippery

For two decades, second-hand clothing has been a boon for Tunisian households. Long perceived as the shopping corner of the poor, it is now prized by all social categories for its quality / price ratio.

Since 2011, the number of leather factories and shoes in Tunisia is declining and many active factories are experiencing financial difficulties. The roots of this serious situation are the lack of control over the legal quantity of finished and semi-finished products imported by secondhand clothes shops, parallel trade. Thus, an illegal competition between textile and leather industry and secondhand clothes shops was created.

In 2016, according to the Ministry of Commerce, trading in old clothes is helping to bail out the state coffers up to millions of dinars, in taxes, annually. However, the weight of tax evasion in this sector is pretty important and exports in this sector cover only a small amount of imports because we export at prices lower than those with which we have imported. Thus, it costs the state a foreign exchange loss.

It should also be known that some second-hand clothes companies export without the money returning to Tunisia, corruption gangrene this sector.

In this situation, the second-hand clothing sector has experienced an uncontrolled development with a large number of non-licensed merchant traders.

This is why representatives of the leather and footwear sector have always been demanding strict enforcement of the law, including the ban on the importation of leather goods by secondhand clothes stores.

August 15, 2018, at the headquarters of UTICA *Tunisian Union of Industry, commerce and Handicrafts* in the presence of the President of the National Chamber of Leather Craftsmen, the President of the National Chamber of Footwear Manufacturers, and the President of the Chamber of Trade of Leather Goods, the shortcomings experienced by the leather and shoes sector were mentioned and discussed, so the first point discussed is that because of the absence of control, the quota of imports of the products used fixed by the law of 1992 organizing the profession to 12%, the equivalent of 10 500 tons per year is not respected (The rate is estimated at 40% or approximately, from 350 thousand to 400 thousand tons annually). It was affirmed, in the same vein, at this meeting, that although Tunisian law prohibits the marketing in second-hand clothes of leather and leather shoes, since they are carriers of germs and harmful to health, we still can see secondhand clothes shops selling leather goods (leather bags, belts and wallets).

Section 2: Study of the causes

The aim of this section is to study the following fundamental causes of the shadow economy in Tunisia: economic causes, fiscal, legislative, social causes, the bad education system, the use of cash and the financial exclusion.

I. Economic causes

1. Price differences

Price differences for oil, tobacco, and other food and non-food items in Tunisia, Libya and Algeria are due to differential tax regimes and subsidies, customs duties and consumption taxes. For example, significant government subsidies are on petroleum in Libya and on gasoline in Algeria, which put their cost far below the market value in Tunisia.

This is particularly true for fuel, as smuggled diesel represents 20 percent of fuel used by the national economy, according to the Tunisian Oil Activities Company. (*According to statements of the CEO of the Tunisian Oil Activities Company, Al Magheb Paper, April 19, 2014.*)

As a consequence, the big gap in prices, especially of fuel, represents a significant incentive for workers to work in the shadows as it enables them to generate considerable profits. For example, truck drivers

may receive between 300 Dinars and 1000 Dinars for one trip between Ben Guerdane and Tripoli, in addition to other profits on logistics. Plus, the absence of development activities in their regions that could offer decent work in the formal sector push informal workers to take important risks and face threats associated with smuggling and underground activities in order to take profit of the price differences

However, we should note that working in the shadows contributes to the extremely low level of formal trade between countries in the Maghreb and between other countries

2. Low-wage jobs

Tunisians' lifestyle is living day to day and to savour life to the full, that's why they are ready to work in the informal sector to top up their income. In other words, working informally is a way of servicing debts without losing benefits.

In addition, they frequently fall behind with their basic household bills such as rent, mortgage, gas, electricity, water and council tax.

For the people in deprived areas, who live day to day and who are unable to make decisions on a long-term basis, low-wage jobs is what pushing them into informal work. They feel that the alternative to taking up informal paid work was absolute material poverty – not having enough income to pay for food and bills. Because as we know their situation is one of 'can't pay' rather than 'won't pay'.

3. The weak capacity of the national economy to generate enough jobs

According to data from the national survey on population and employment for the first quarter of 2019 conducted by the National Institute of Statistics (INS), Tunisian economy suffers from structural unemployment, which for many years hit more than one active in seven in 2016 and still affects 15.3% of the labor force (637 thousand 700 unemployed) in 2019. While the majority of the unemployed are low-skilled, young people (15-24 yr.) show the highest unemployment rate (34.3% in 2019). Young people are also overrepresented among inactive people. Moreover, a significant disparity is also observed between the coastal areas most developed in terms of service or industry infrastructure (including manufacturing) and within the country where jobs are scarcer or more precarious. This unemployment contributes significantly to the palpable social malaise in Tunisian society, as illustrated by several major social conflicts (notably in January 2016 in Kasserine or in May 2017 in El-Kamour, in the governorate of Tataouine).

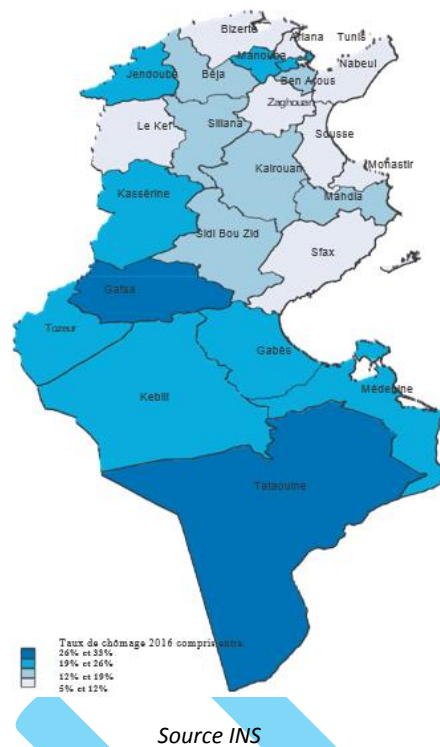
The large proportion of unemployed represents a mass of assets, most of them engaged in the informal economy, and thus operating largely in the margins of formal financial and social systems and systems.

They therefore represent a major challenge for the Tunisian economy of tomorrow, who must find ways to allow them to develop sustainable productive activities: This goes through their social and financial inclusion, which thus constitutes a major challenge for the country

In this context, in the city of Kasserine, where an important percentage of employees work in the shadow sector, there is those activities which are related to the smuggling with its neighboring country “Algeria” that create the conditions of unfair competition with the formal sector that cannot develop because many reasons, and one of them is the inability to offer attractive pay rates compared pay rates offered by smuggling activities. That’s why people there will risk taking shadow work in order to avert more immediate situations such as going hungry.

4. Low level of private investment in the interior regions

Maintaining a strong centralization of decisions and the lack of fast connections between inland and coastal areas have led to a concentration of activities on coastal areas leaving the interior regions behind. This concentration has led to a decline in the level of private investment in the interior regions limiting the development of productive activities leading to a wide dispersion of the unemployment rate between the regions.



Without pretending to be representative of the diversity of Tunisia, certain localities illustrate some characteristic aspects of Tunisia:

The governorate of Kasserine

Located in the center west of Tunisia, the governorate of Kasserine along the Algerian border. It remains highly rural with 61 per cent of the population and has a high rate of emigration to coastal areas and Tunis. According to the INS* studies of August 2018, the unemployment rate is high 24.1 per cent in 2018, as well as the poverty rate which one of the highest among the governorates.

In addition, this region suffers from its isolation and low investment and private initiatives that remove any prospect of development. The local economic is not currently a solid foundation for economic recovery in the region, and does not allow for the implementation of an active employment policy, consisting mainly of small units of work. Public worksites are practically the only source of job creation and subject to clientelism and corruption.

For the rest, the economy of the governorate revolves around the parallel trade of products imported from Algeria. Social problems (drugs, crime, violence, etc.) are spreading and the lack of leisure and entertainment centers is pushing young people to frequent cafes. To these difficulties is added, since the revolution of January 14, 2011, the emergence of terrorist homes on the Chambi Mountains, which have never been reduced.

Town of Ben Guerdane

Ben Guerdane is a commune and coastal town in south eastern Tunisia, close to the border with Libya. In a report published in December, the World Bank estimated that 20 percent of the

active population in the Ben Guerdane region work are smugglers, making it "one of the largest employers (if not the largest) in the region."

Everything from oil to electronics, hard currency and video games can be bought and sold there, with the profits “navigating” a vast web of global business dealings. Trafficking in drugs and weapons is also suspected, although this type of trafficking is less visible due to the increased vigilance of security forces.

The gradual proliferation of parallel trade in downtown Tunis coincided with the intensification of a migratory wave from the center-west to the capital to escape the poverty characteristic of "inner" rural areas, little affected by the development policies of the post-colonial state.

II. Fiscal and legislative causes

1. Fiscal causes

a. High taxation on labor

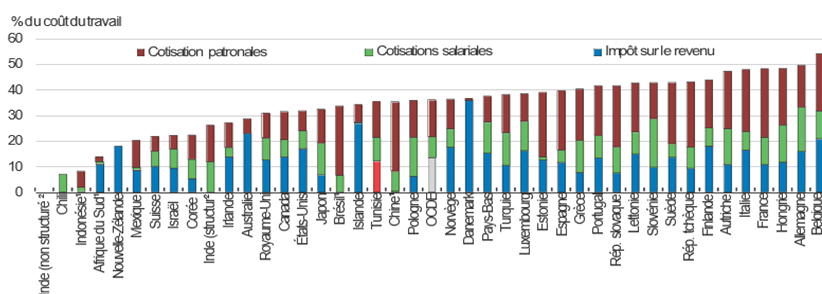
An important determinant of informal work in Tunisia is the high level of the tax wedge, ie the burden of social security contributions (employers and employees) and the income tax. A high tax burden limits the hiring incentives for employers and participation in the formal labor market for employees.

In point of fact, the increase in employer and employee contributions to social security funds included in the Finance Act 2018 could weigh on the formal work which contributes to tax avoidance thus, working in the shadows.

Even internationally, as can be seen in the figure below, Tunisia's tax system is one of the rigid regimes where social contributions are a burden on formal employment (38%-39% of labor cost) so, a program of legal reform needs to be adopted to absorb the workers in the shadow economy.

Graphique 2.10. Les cotisations sociales pèsent sur l'emploi formel

Fiscalité sur les revenus du travail, 2016



1. Les données se réfèrent à l'année 2010 pour le Brésil, la Chine, l'Inde et l'Afrique du sud et à l'année 2009 pour l'Indonésie.
2. Le secteur non structuré en Inde correspond aux entreprises employant moins de 20 personnes. Les entreprises de plus de 20 salariés doivent se conformer à la loi sur le fonds de prévoyance des salariés et autres dispositions et, à ce titre, s'acquitter de cotisations sociales.

Note : Scénario pour un célibataire sans enfant avec un salaire égal à 100 % du salaire moyen.

Source : Statistiques des recettes publiques de l'OCDE; et ministère des Finances de la Tunisie.

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<http://dx.doi.org/10.1787/888933694631>

b. High import taxes

Imported goods in Tunisia can be subject to high tariff rates depending on the product, taking for example, the 2018 Finance Law that increased tariffs on certain products: tariff rates were increased to 36% on products such as salmon, natural honey, avocados, and pineapples, and to 30% on products such as washing machines and video monitors. In addition, some products originally exempt are now subject to a 15% tariff, such as lubricating oils, tanning extracts, soap,

adhesive preparations, pesticides, vinyl, pipes and hoses, hides and skins, craft paper, sewing thread, natural pearls, screws, bolts, drilling tools, and dishwashers.

c. Consumption taxes

Tunisia's basic VAT *Value Added Tax* rates are 19%, 13%, and 7%, with the majority of local goods covered by the 19% rate. It is also applicable to certain imported and similar locally produced items.

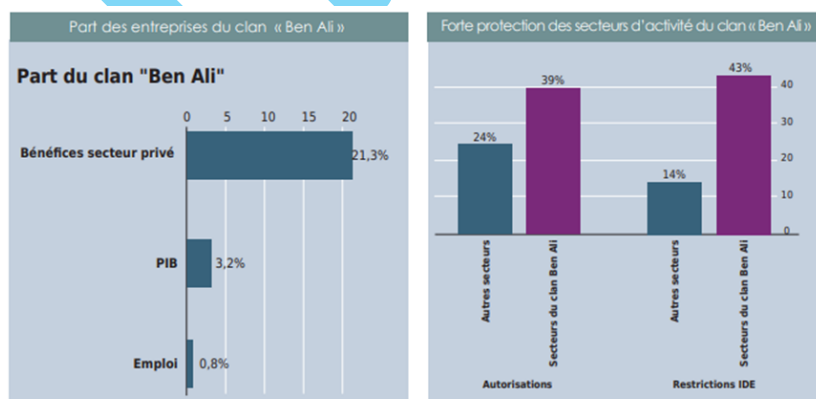
The highest rates are applicable to cosmetic products (which represent a great part of smuggled products) and luxury items (automobiles with large engine capacity also carry a high consumption tax, with rates up to 277% for gasoline-fueled engines and 360% for diesel-fueled engines). It is clear that High taxes are important determinants of the informal sector in Tunisia

2. Legislative cause

The regulatory system of economic activity was originally created for the purpose of protecting the well-being of citizens and national enterprises. But in reality, before the Revolution, it had rather turned into a screen allowing a minority close to the political power to enjoy privileges, to obtain annuities and make profits unwarranted. In addition, a bundle of administrative restrictions and obstacles to foreign investment, rules and practices allowed to protect some sectors and companies held by families close to the regime.

Thus, Tunisians lived and still live in an unfair economic system where a limited number of people monopolized profits and opportunities and benefited from the wealth. These patronage practices manifested under several forms:

- Repeated amendments to Investment Incentives Code for certain people
- Violations of the laws governing economic activity and the rules of competition
- Preservation of information on essential business opportunities for economic operators for the development of their activities
- Licensing and a public procurement process without respecting procedures and equal opportunities in favor of companies close to power, lead to an unfair competition on the local market, companies close to power



Source : Résumé non technique La Révolution Inachevée : Créer des opportunités, des emplois de qualité et de la richesse pour tous les Tunisiens Mai 2014 Groupe de la banque mondiale

So, this regulatory system has made difficult the capacity of citizens to participate in the economic activity, to create their own companies or to access credit. Thus, making difficult the capacity of the national economy to start and offer a purchasing power and good jobs to the people. The economic difficulties in Tunisia are therefore partly due to a business climate that is favored to a minority who is close to the politic power over fair competition which is the pillar of economic growth.

Thus, the absence of competition, the recrudescence of favoritism and the proliferation of laws had led to the restriction of economic initiative and had deprived Tunisia of the possibility of moving forward on the path of development.

III. Social causes

1. Corruption

a. Bribery

Working in parallel trade poses constraints, especially as the working space is a public space. It is subject to state control. Before, the police were much more severe than today, they were letting the dogs go on parallel traders, however, traders didn't gave up to negotiations to obtain permits from the municipality. The one who was in charge of the market at that time was responsible of getting permits for his "brothers" from municipality. In order to do that, parallel traders should pay him a nominal amount of money "Bribe", and then they make subdivisions, each had a tile.

Gradually, the force gave way to negotiation in the management of this activity and traders managed to obtain a negotiated arrangement in order to practice their profession under more or less organized conditions.

For example, in the mid-1990s, there were only a handful of traders in the Moncef Bey space who sold various products: sheep, second-hand clothes, glasses, gas oils, etc, but gradually, a double process of specialization and gentrification has profoundly transformed the vocation and structuring of the Moncef Bey space.

Placed under the management of the municipality of Tunis, this space welcomed the requisitioned animals of the offenders and little by little business flourishes.

This was explained by a complex process of bribery, a moral economy of commerce and a spirit of solidarity.

b. Customs fraud

Customs fraud in ports has not always been thoroughly examined, which led to an increase in customs fraud since the revolution. Apart from smuggling, customs fraud in Tunisian ports or at the Tunisian borders is based on "conventional" techniques, such as misclassification, undervaluation of imports, false declarations of the country or the place of origin, and abuse of duty suspension regimes.

The most widespread form of customs fraud concerns the undervaluation of goods on the customs import declaration, because it reduces the duties payable to the customs authority.

In point of fact, there is also another form which is the inaccurate marking of the country of origin to avoid a higher duty if the actual country of origin is subject to a high duty regime. Another, is the misclassification of products is also a common problem as it involves declaring a product under a lower duty category than its real duty category.

Last, is the lack of full or partial payment of customs duties? Although regular importers and large firms are unlikely to default on their obligations, there is a risk that this may occur for irregular importers or when a product dumping fine has been imposed subsequently.

2. The enthusiasm of youth for quick gain and the good life

a. Seasonal jobs attract young people more than the private sector

In the regions, the youth are opting for jobs that pay the most like, working in the informal sector or working seasonal jobs (work in the seasonality of tourism) or risky jobs (smuggling) which is in detriment of the formal sector which it still isn't able to compete with the pay rates of these jobs.

In fact, tourism which is one of the most important sectors of the Tunisian economy, is built on the foundations of precarious informal employment (fixed-term contracts that do not even imply registration with social security, and whose clauses may not even be respected), yet the income from it, will in a few months, make the tourism worker earn more than the average private sector salary over a year.

On March 19, 2019, the president of the regional federation of hotels in Monastir said during a working meeting at the seat of the governorate that hotels in the region are asking to recruit more than 1000 employees. He added that it is possible to recruit more than 1000 men and women as seasonal workers or permanently depending on the specialty of the job

b. No risk-taking! No initiative-taking!

In point of fact, young people are torn between wage labor and entrepreneurship, between the public service and the private sector, however, many of them are naturally opting for stability and the best protection because of the salary which is at the end months, a very extensive social protection (health, maternity, retirement), as well as a hierarchy less heavy than in the private sector. Another, even the education system, it does not prepare for risk taking and private initiative, therefore, it is clear that the public service, the stable wage and guarantees offered (social security is considered as an essential element) continue indeed to be sought, despite the fact that the state can no longer offer a job for all the young people.

However, to be integrated in the public sector is often chaotic, for example:

- It is estimated that the average period of integration of young people is 6 years in Tunisia, a delay that the OECD considers to be significantly higher than in most countries.
- According to the results of ETVA (BIT-ONEQ, 2014), 65 per cent of young Tunisians want to work in the public and 22 percent in the private sector and 10 percent self-employment.
- The process of crowding out public service contests from those with a CNSS number. This action taken in the context of the "Amal" program adopted in the aftermath of the 2011 revolution in order to ease social tensions, reserved jobs in the public sector to those who were registered as job seekers. The program would have had a catastrophic impact on the youth unemployment rate in particular and ultimately on their informal employment rate, creating an artificial crisis situation whose effects are still felt today even though laws have come to modify this situation state of affairs.
- Employers' preference of non-registration of employees to social security: it is true that many young people do not wish to be declared by their employers in order to retain a chance of being recruited into the public service or the public sector, for example the Company Gafsa Phosphate (to be recruited must not already have a social security

number), the fact remains that employers prefer verbal contracts and are always consistently against registration.

So, it's clear that, taking no risk and showing no initiative, and looking only for a job in the public sector which is also a sector full of problems, can't solve the problem of unemployment "the silent epidemic" related to the shadow sector.

IV. The education system: A reform is needed

According to a study by the National Observatory of Youth conducted in cooperation with the World Bank, one million young people are inactive, a third of Tunisian youth.

On a global scale, the categories of inactive persons are classified under the name NEET which means Not in Education, Employment or Training (neither student, employee nor trainee). According to the definition, this is a negative classification that includes people aged between 15 and 29 and who have left the school system.

Today, youth inactivity is a major problem in Tunisia. Faced with economic difficulties, Tunisian youth is left behind. A recent survey shows that 62% of young people do not trust state institutions. The main points that can reflect the reasons behind the high unemployment rate are:

1. Vocational training

Traditionally, vocational training is reserved for those who failed in their studies, nowadays it seems to be an option again, especially for those who have not chosen it at the right time.

Beyond this radical criticism of the education system, the contours of decent employment are outlined, as made by young people who have known for the most part since leaving school or university only odd jobs, precarious contracts and informal employment.

In this context, on the sidelines of an international conference on the management and empowerment of vocational training centers, Ayida Ounissi, Minister of Vocational Training and Employment has recently said that 60% of graduates of vocational training in Tunisia are hired in the first year after graduation. In this regard, the ministry is committed to increase the capacity of the Tunisian vocational training system from 25,000 young people currently to 55,000 young people by 2020 (Par Entreprises Magazine 12 décembre 2018) and that what shows that nowadays the vocational training is finally considered an important issue that should be taken seriously as soon as possible.

It's clear then, that if we focus on this issue, it will be a new start for young people who have a flare for the vocational skill and it will be an opportunity to carry on by opening there their own businesses in spite of working in the shadows thus less unemployment, less crime and less jobs in the shadows, hence contribution to the economy.

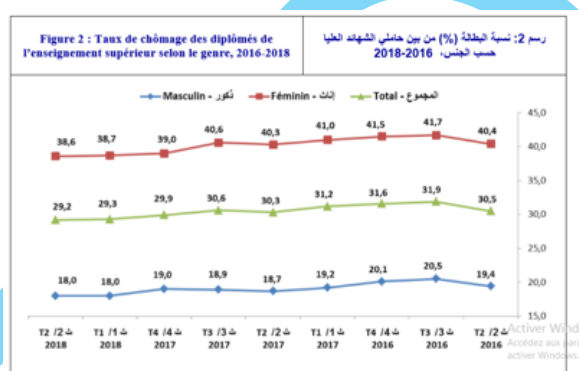
2. Mismatch between education system and labor market demand

Tunisia is characterized by a longer average duration of education among young people than in most developed countries which can explain why young people don't keep up with Tunisian educational system, which can lead a young student to drop out of high school or university in a young age which can lead to the persistence of a high and long-term unemployment rate for young graduates. So it's clear that the main reason is the loss of confidence on the education system. According to the INS*, the age at which 50 percent of young people drop out of school is 20.4 years old.

Another, the inadequacy between the studies pursued and the job market is of course underlined and it is clear that the solutions to this persistent problem for several decades still have not solved. While the problem is not specific to Tunisia, it is particularly acute and one of the factors explaining why underemployment is so widespread and why the feeling of dissatisfaction with the job being exercised is also generalized.

Youth unemployment results from dysfunctions of a very elitist post-baccalaureate orientation system, which select the best and leave the majority of young graduates to pursue studies in fields offering very few job opportunities (law, literature, history, management, economy, etc.) As a consequence, the exercise of an activity unrelated to the studies pursued is common and young graduates are aware of the underemployment and the waste of human resources which is leading to what we are fearing the worst, working in the shadows.

Tableau : Le taux de chômage des diplômés de l'enseignement supérieur 2016-2018



Source INS

The number of unemployed graduates in tertiary education is estimated at 258.6 thousand in the second quarter of 2018 compared to 260.2 in the first quarter of 2018, a decrease of 1.6 thousand. The unemployment rate dropped from 29.3% to 29.2%.

V. The financial exclusion and the use of Cash

1. The Financial Exclusion

a. Definition

To define the financial exclusion, it is necessary to have a definition for financial inclusion that is adapted to the Tunisian context. The financial inclusion is defined as follows: "Financial inclusion defines the possibility for natural or legal persons, poorly or unserved, to have access to a range of financial and non-financial products and services best suited to their needs, offered by a multitude of formal actors".

Nowadays, the Tunisian authorities is giving financial exclusion dilemma a central importance in their efforts to provide concrete solutions to the socio-economic problems of Tunisians because being financially excluded is one of the causes of the "Cash Economy" and of the "Shadow Economy", how?

The financial exclusion is a constraint to:

- Day-to-day transactions, including sending and receiving money.
- Households who need help to manage cash flow spikes, smooth consumption and build working capital.

- Individuals who need help to finance small businesses or microenterprises, helping owners invest in assets and grow their businesses.
- Poor families who want to improve their overall welfare.

b. The use of financial service : Very low

This study was conducted for the benefit of the Ministry of Finance of Tunisia, the supervisory authorities and the Observatory of Financial Inclusion (Central Bank of Tunisia) under the management of the European Investment Bank - and the exceptional contribution of the Ministry of Foreign Affairs of the Grand Duchy of Luxembourg, within the framework of the MicroMED program, followed by a collaboration with the INS to allow replication of the study.

- Individuals: Tunisian adults (18 years old and over)

- Micro-enterprises: for companies with 5 employees or less

The areas of analysis that are qualitative dimensions and areas identified in the questionnaires that are sent to individuals and businesses have been standardized by international surveys dedicated to facilitate consistency and international comparability of financial inclusion indicators.

Inclusive growth is facing multiple obstacles in Tunisia, a very low use of financial services is, among other things, a major constraint:

- 61% of Tunisians individuals and 55% of micro-enterprises are customers of a formal financial institution including the post office, MFIs and insurance companies.
- Only 9% of Tunisian individuals and 25% of micro-enterprises are active customers of formal financial institutions that register at least 3 transactions per month on their client account.
- The use of formal financial service (means of payment, credit, paid savings, insurance, non-financial services, etc.) by the Tunisian individuals never exceed 17%, and the use by micro-enterprises never exceed 34%.
- 16% of Tunisian individuals had a formal credit last year and 66% of them had an informal one and 33% of micro-enterprises had a credit and 46% had an informal credit last year
- The use of means of payment replacing the cash by individuals is 17%, and the use by micro-enterprises is about 34%. In addition, the use of a financial service on mobile phone: 3% of Tunisians have already used this service.

c. Access to financial institutions / financial knowledge: Average

Access

Inclusive growth is facing multiple obstacles in Tunisia, an average access to financial institutions and financial services is, among other things, a major constraint, particularly in disadvantaged regions.

Répartition des DAB par région

Région	Nombre d'adultes ⁸ (18 ans ou plus)	Banque		Poste	
		Nombre DAB bancaires ⁹	Ratio nombre de DAB pour 100 000 adultes ¹⁰	Nombre de DAB postaux ¹¹	Ratio nombre de DAB pour 100 000 adultes ¹²
Grand Tunis ¹	1 962 810	1 060	54	66	3,3
Nord-Est ²	1 103 783	328	30	24	2,2
Nord-Ouest ³	854 098	140	16	21	2,5
Centre-Est ⁴	1 828 670	675	37	55	3,0
Centre-Ouest ⁵	986 407	103	10	18	1,8
Sud-Est ⁶	712 297	250	35	21	3,0
Sud-Ouest ⁷	427 385	87	20	14	3,3
Total	7 875 450	2 643	33	219	2,8

Sources : (1) Gouvernorats de Tunis, Ariana, Manouba, Ben Arous ; (2) Gouvernorats de Nabeul, Bizerte et Zaghouan ; (3) Gouvernorats de Béja, Jendouba, Kef et Siliana ; (4) Gouvernorats de Sousse, Monastir, Mahdia et Sfax ; (5) Gouvernorats de Kairouan, Sidi Bouzid et Kasserine ; (6) Gouvernorats de Gabès, Médenine, et Tataouine ; (7) Gouvernorats de Gafsa, Kébili et Tozeur ; (8) Calculs Altai Consulting sur la base des données INS issues du RGPH 2014 ; (9) BCT, 2018 ; (10) Calculs Altai Consulting ; (11) La Poste, rapport annuel, 2016 ; (12) Calculs Altai Consulting.

There are large regional disparities in the distribution of ATMs relative to the population, particularly for bank ATMs: the Center-West and North-West regions are the least well-endowed

with ATMs compared to their population while the Greater Tunis regions Central East and Southeast are those with the most ATM per capita.

Perception/financial knowledge: Low

The main barriers to accessing and using financial services are:

- The cost: Only 32% of micro-enterprises consider that the cost of financial services is accessible and 38% of Tunisian individuals consider that the cost of financial services is accessible.
- Lack of confidence in formal institutions: 52% of micro-enterprises trust formal financial institutions and 53% of Tunisian individuals have confidence in formal financial institutions.
- A low-level financial knowledge: 3, 1/7 is the average score obtained by Tunisian individuals for a financial knowledge test.

d. Conclusion : Causes of the Financial exclusion

Tunisia, although endowed with a dense and varied economic fabric and a large pool of skilled labor, remains confronted with development and unemployment problems intimately linked to the financial exclusion of individuals and companies and thus to the Shadow economy. These problems include four important findings:

- The cleavage between urban and rural areas, which has its origins in a historically contrasting and unequal development of the territory.
- The low level of education and financial literacy are the main cause of financial exclusion.
- The inequality of inclusion between rich and poor populations, which underlines the historical disinterest (or lack of knowledge) of economic agents and especially financial institutions for the disadvantaged segments of the Tunisian population.
- The coexistence of two economies with comparable weights: the formal economy which is known, studied, measured, and the shadow economy, which has so far received little attention in terms of its importance and whose precise contours remain little known. However, it's important to note that the shadow economy is the cause and a consequence of the financial exclusion.

2. Cash-dominated transactions

a. Cash-still king

Tunisians, they « love » cash. In other words, we can see an increase of fiduciary circulation and of the behavior of economic agents regarding cash in Tunisia. This means that fiduciary circulation is increasing faster than nominal GDP, probably reflecting a change in the behavior of economic agents and reflecting a clear preference for the use of cash.

According to the latest figures published by the Central Bank of Tunisia, the notes and coins in circulation on 19/09/2019 amounted to 13736 MTD, which is a staggering amount considering the lack of liquidity in our financial institutions. Measures have then been taken recently to limit cash payments and to emphasize other payment methods, especially for major purchases, such as debit cards, checks and the transfer from one bank to another in a current account.

b. Causes

Cash payments are simple, secure, efficient and anonymous, which is why consumers still prefer to pay their purchases as large as they are by cash money. At the same time, these characteristics

also make cash a focal point for potential illegal uses. In other words, cash promotes the shadow economy and is used as a means of financing crime.

In addition, several traders in Tunis and elsewhere still do not accept checks which represent one of the solutions to limit cash in circulation under the pretext that this method of payment has been the cause, in the past, of several problems borne by the merchant. Indeed, it has been found, on several occasions, that the customer's bank account does not contain sufficient funds, which causes a significant shortfall for the merchant. Although the court is suing the defaulters, the case is very time-consuming and does not solve the problem.

Some people go so far as to keep their money in safes at home or in their workplace for use when needed. This archaic method has no profitability for the taxpayer and for the State. Formerly, the economy of money was done at home for fear of seeing the banks deduct certain taxes without the knowledge of the client especially when feeding the account.

Also, it is important to note that the use of cash has another cause, it is automated teller machine (ATMs) that are available almost everywhere but that are not always functional when we need them especially during the weekend and national holidays. It must sometimes walk around the town to "discover" a distributor that operates normally. Such automated teller machine (ATM) failures do not really encourage consumers to deposit their funds at a bank.

- All these causes explain why cash still "King", and if we want to tackle the shadow economy we should think about how to eliminate all possible causes of the dominance of cash transactions.

Conclusion

Tunisia's shadow economy is a phenomenon that did not begin with the 2011 revolution but has in fact existed for a number of years at Tunisia's borders where goods (tobacco, oil, drugs and weapons ...) and even cash are smuggled across the borders with Libya and Algeria. It also takes other variety of forms: people selling on the streets, people providing tutoring, or individuals being employed by a formal company without being issued a contract etc. In Tunisia, such activities make up a significant and growing part of the Tunisian economy.

Tunisia's shadow economy is a recognized consequence of imperfections in the Tunisian economic system. Globally speaking, the main causes are prices differences, high taxation, corruption, the enthusiasm of youth for quick gain and the good life, the weak capacity of the national economy to generate enough jobs, low level of private investment in the interior regions, an education system which is characterized by a "misunderstanding" of the vocational and by a mismatch between education system and labor market demand and vocational training. In addition, in Tunisia cash dominated transactions and the financial exclusion are also major causes of the expansion of the shadow economy and are now the main focus of the Center Bank of Tunisia in order to shrink the phenomenon "un-observed shadow economy".

Partie2: The size of the shadow economy in Tunisia



Partie2: The size of the shadow economy in Tunisia

Chapter I: Estimation the size of the Shadow Economy

Despite the large amount of empirical work on the shadow economy in several countries over the past years as well as in recent years. These studies focused on the Tunisian context remain rare. Methods used to estimate the size of the shadow economy, can be broken down into four categories. The first one consists of all indirect methods that produce an estimate by using macroeconomic indicators and is called 'macro-model methods'. The second category consists of all indirect methods, called also 'micro methods' produce a careful and detailed data analysis to estimate the size of the shadow economy. The third category consists of statistical model that considers the shadow economy as a latent variable and is called "MIMIC" (Multiple Indicator and Multiple Causes) Method and the fourth category consists of methods that do not fit into the first three.

This chapter will also be devoted to estimating the size of the shadow economy in Tunisia. First, we propose to define the determinants of money demand (Cash in circulation). Then, we present in detail the empirical methodology used. We then go on to the analysis of stationarity, changes in variables over time and the basic model used.

Finally, depending on the results obtained, we determine the size of the shadow economy in Tunisia.

Section 1: Empirical literature review

The methods, used to estimate the size of the shadow economy, can be broken down into four categories.

Macro-model methods

Discrepancy methods

Physical input method

Monetary methods

- Transaction method

- Currency-demand method

Statistical-model method

The MIMIC method

Micro- model methods

Tax audits

Household surveys

Other methods

Observation and participation

Delphi method

Sensitivity analysis

I. Indirect approaches

These approaches, which are also called macroeconomic approaches use various economic indicators that contain information that may help to measure the development of the shadow economy over time.

1. Discrepancy methods

a. The discrepancy between national expenditure and income statistics

Studenski (1958) considers three methods to estimate national income. If the national income is based on data on production, he calls this the 'production method'. If it is based on data on international trade, consumption and investment, he calls it then the 'expenditure method'. But if it is based on data on income Studenski calls this the 'income method'. Generally speaking, income method based estimates are the lowest. Because of the existence of the shadow economy. In national accounting the income measure of GDP should be equal to the expenditure measure of GDP. In this context, the discrepancy between national expenditure and income statistics approach is another approach to measure the shadow economy, it is based on the idea that individuals working in the shadow economy are able to hide their incomes for tax purposes if they want to but not their expenditure, hence the gap between national income and national expenditure could be used as an indicator to approximate the size of the shadow economy.

$$\text{Estimate of the hidden economy} = \text{Expenditure measure} - \text{Income measure}$$

Since national accounts statisticians are anxious to minimize this discrepancy, the initial discrepancy or first estimate, rather than the published discrepancy, should be employed as an estimate of the shadow economy.

This method has several weaknesses:

- This approach assumes that all components on the expenditure side are measured without error so that they are statistically independent from income factors.
- The initial discrepancy or first estimate, rather than the published discrepancy, is employed as an estimate of the shadow economy.
- The discrepancy reflects not only the shadow economy but also all omissions and errors in national account statistics. These estimates may therefore be crude and of questionable reliability.

b. The discrepancy between the official and actual labor force

According to Contini (1981) a decline in labor force participation in the official economy can be seen as an indication of increased activity in the shadow economy, if total labor force participation is assumed constant. In other words, according to the participation-ratio method, a decrease of official employment means that there is a shift going on from the official labour market towards the underground labour market.

$$\text{The underground labour market} = \text{Actual labor market} - \text{Official labour market}$$

This method has several weaknesses:

- Differences in the rate of labor participation may have other causes, such as the position in the business cycle, difficulty in finding a job and education and retirement decisions which represent weak indicators of the size of the shadow economy.

- People can work in both the hidden economy and the official economy. Therefore such estimates may be viewed as weak indicators of the size and development of the shadow economy.

2. Physical Input (Electricity Consumption) Method

If there is a strong relation between a well-measured variable and national income, this variable can be used to forecast economic growth. Kaufmann and Kaliberda (1996) assumes the idea that electricity consumption is the single best physical indicator of overall (official and unofficial) economic activity. Therefore, there is a stable relation between the use of electricity and national income. Due to the fact that overall economic activity and electricity consumption have been empirically observed to move in lock-step, with an electricity/GDP elasticity usually close to one, these authors suggest using the difference between growth of electricity consumption and growth of official GDP as a proxy for the growth of the shadow economy.

$$\text{Growth of S.E} = \text{Growth of electricity consumption} - \text{Growth of official GDP}$$

Although this method is simple and appealing, it has several weaknesses:

- Not all shadow economy activities require a considerable amount of electricity (such as personal services) or they may use other energy sources (such as coal, gas, etc.), hence only part of the shadow economy growth is captured. The output of agriculture, for example, heavily depends on the weather conditions.
- Electricity-overall GDP elasticity might significantly vary across countries and over time. For example, in many developing and transition countries electricity is not even the major source of energy in industry.

The trend of more energy-efficient production and the invention of energy-efficient consumer goods aren't taken into consideration.

3. Transaction Method

The transaction method was first described by Feige (1979). Starting point is Fischer's quantity equation:

$$\text{Money} * \text{Velocity} = \text{Prices} * \text{Transactions.}$$

Further it is assumed that there exists a constant relation between the money flows and total national income:

$$\text{Prices} * \text{Transactions} = k (\text{official GDP} + \text{shadow economy}) = \text{Total nominal GDP.}$$

The stock of money and official GDP estimates are known, and money velocity can be estimated. However, to estimate the shadow economy and to calculate it for the rest of the sample, one must also assume a base year in which there is no shadow economy and then the ratio of $p * T$ to total nominal (official = total) GDP was "normal" and would have been constant over time if there had been no shadow economy.

$\text{Prices} * \text{Transactions} = \text{Total nominal GDP} = \text{Official GDP}$ in a base year

Relating total nominal GDP to total transactions, the GDP of the shadow economy can be calculated by subtracting official GDP from total nominal GDP.

$$\text{Shadow economy} = \text{Total nominal GDP} - \text{Official GDP}$$

Although theoretically attractive, this method has several weaknesses:

- Assumption of a base year with no underground economy
- Assumption that k would be constant over time seems quite arbitrary
- Need precise figures of the total volume of transactions. This might be especially difficult for cash transactions, because they depend, among other factors, on the durability of bank notes in terms of the quality of the paper on which they are printed.
- Other factors like the development of checks and credit cards could also affect the desired amount of cash holdings and thus velocity.

In short, although this approach is theoretically attractive, the empirical requirements (data requirements) necessary to obtain reliable estimates are so difficult to fulfill that its application can lead to doubtful results.

4. Currency-demand method

The currency/deposit ratio method uses figures about the ratio between currency and transferable money. According to Gutmann (1977) the currency/deposit ratio is only affected by changes in taxation that change the way people make payments. It is assumed that the main reason that people change behaviour is that they want to hide certain activities to avoid taxation. Guttmann illustrates the method by an example from the United States. After a short rise during the Second World War, the currency/deposit ratio for the US remains almost constant until 1961.

Tanzi (1983) developed this approach further and used it to measure the size of the underground economy in the USA. He assumed that shadow transactions are undertaken in the form of cash payments, in order to leave no traces for authorities, an increase in the size of the shadow economy will, consequently, increase demand for currency.

$$\text{Increase in underground economy} = \text{Increase in cash demand}$$

In order to isolate excessive demand for cash, Tanzi (1980) suggests using a time series approach which is an equation for currency demand econometrically estimated over time.

The currency demand is then a function of control variables, such as the evolution of income, payment habits, interest rates and so on. In addition to control variables, there is factors causing people to work in the shadow economy, such as the tax burden, government regulation and the complexity of the tax system. And then,

$$\text{Excess demand for cash} = \text{Amount unexplained by the control variables}$$

Tanzi who developed this approach and used it to measure the size of the shadow economy in the USA postulates that the demand for cash money as a proportion of total money $C/M2$ is a function of taxes, wages and salaries, the interest on fixed term deposits and per capita real income.

Based on a regression analysis the result is two different estimates of the notional demand for cash money: The first is the total demand for cash money with taxes taken into consideration. The second is the demand for cash money without tax pressure.

The difference between the total currency ratio (=total demand for cash money) and the ratio without any tax pressure (the demand for cash money without tax pressure) resulted in the shadow economy

Assuming that the velocity of money in both types of economy the shadow economy and the official economy is the same.

$$\ln(C/M2) = \beta_0 + \beta_1 \ln(1+TW)_t + \beta_2 \ln(WS/Y)_t + \beta_3 \ln R_t + \beta_4 \ln(Y/N)_t + v_t$$

With $\beta_1 > 0$, $\beta_2 > 0$, $\beta_3 < 0$, $\beta_4 > 0$

- C/M2 is the ratio of cash holdings to current and deposit accounts,
- M2 is cash money + transferable money + fixed period deposits
- TW is a weighted average tax rate (as a proxy for changes in the size of the shadow economy),
- WS/Y is a proportion of wages and salaries in national income (to capture changing payment and money holding patterns),
- R is the interest paid on savings deposits (to capture the opportunity cost of holding cash) and
- Y/N is per capita income.

Cash money in the S.E= the actual demand for cash money- the notional demand

Although this method is one of the most commonly used methods, it has several weaknesses:

- It may underestimate the size of the shadow economy because not all transactions take place using cash as means of exchange;
- Increases in currency demand deposits may occur because of a slowdown in demand deposits rather than an increase in currency used in informal activities;
- The velocity of money in the official economy is hard to estimate. The velocity of money in the hidden economy is even harder to estimate.
- The assumption of no shadow economy in a base year is arguable.

The assumptions underlying the three monetary methods are at least questionable. A crucial assumption of the currency/deposit method and the currency-demand method is that a growing underground economy is caused by changes in taxation and government regulation, which leads to an increasing demand for cash money. The majority of the payments in the underground are assumed to be cash. This assumption is not always verified.

- These four methods capture a good portion of shadow. They use mostly macroeconomic data and various economic and other indicators that contain information about the development over time of the hidden economy. But still, No ideal or dominating method because they all have serious problems and weaknesses. If possible we can use several methods to determine the size of this phenomenon.

II. Statistical-model method

The statistical model method is called also the empirical MIMIC method. It is quite different from those described so far. It is based on the statistical theory of unobserved variables.

Zellner (1970) and Joreskog and Goldberger (1975) consider the statistical theory of unobserved variables to estimate the size the shadow economy, they call this 'the MIMIC model' which is a special type of structural equation modelling (SEM) that is widely applied in psychometrics and social science research.

The pioneers to apply the MIMIC model to measure the size of the shadow economy in 17 OECD countries were Frey and Week-Hannemann (1984). Following them, Tedds (2005), Chaudhuri et al. (2006), Farzanegan (2009), Schneider (2010) and Hassan and Schneider (2016).

Multiple Indicators, Multiple Causes (MIMIC) approach: This method explicitly considers several causes, as well as the multiple effects, of the shadow economy. The methodology is used to confirm the influence of a set of exogenous causal variables on the latent variable (shadow economy), and also the effect of the shadow economy on macroeconomic indicator variables, to estimate the latent variable itself. Therefore, the MIMIC model is considered to be a confirmatory rather than an explanatory method.

The MIMIC estimation procedure has two parts: the structural model and the measurement model. This procedure involves three steps:

- Modeling the shadow economy as an unobservable (latent) variable.
- The structural model: A description of the relationships between the latent variable and its causes.

$$\eta = \Gamma x + \zeta$$

- The measurement model: A link between the latent variable and its indicators.

$$y = \Lambda_y \eta + \varepsilon$$

Where

η : latent variable (shadow economy)

X : ($q \times 1$) vector of causes in the structural model

Y : ($p \times 1$) vector of indicators in the measurement model

Γ : ($1 \times q$) coefficient matrix of the causes in the structural equation

Λ_y : ($p \times 1$) coefficient matrix in the measurement model

ζ : error term in the structural model and ε is a ($p \times 1$) vector of measurement error in y .

The specification of the structural equation is:

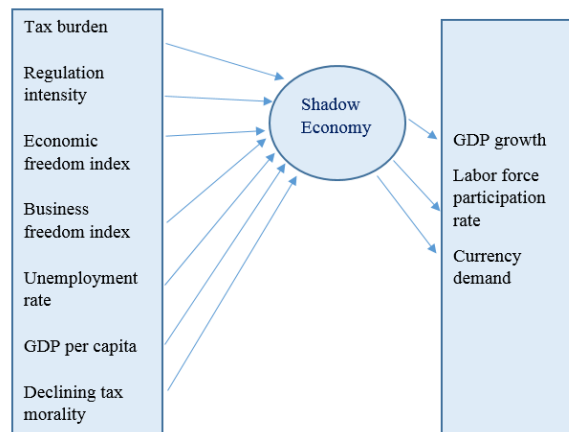
$$[\text{Shadow economy}] = [\gamma_1, \gamma_2, \gamma_3, \gamma_4, \gamma_5, \gamma_6, \gamma_7, \gamma_8] \times [\text{Share of direct taxation}]$$

- [Share of indirect taxation]
- [Share of social security burden] + [ζ]
- [Burden of state regulation]
- [Quality of state institutions]
- [Tax morale]
- [Unemployment quota]
- [GDP per capita]

The specification of the measurement equation is:

$$\begin{array}{l} \text{Labor force participation} \\ \text{rate} \\ \text{Currency demand} \\ \text{GDP growth} \end{array} \left| \begin{array}{l} \lambda_1 \\ \lambda_2 \\ \lambda_3 \end{array} \right| * \text{Shadow economy} + \left| \begin{array}{l} \varepsilon_1 \\ \varepsilon_2 \\ \varepsilon_3 \end{array} \right|$$

Where γ_i and λ_i are coefficients to be estimated.



In order to calculate the size of the shadow economy, the following steps are necessary:

1. Estimate the latent variable 'shadow economy' which is considered as an unobserved phenomenon by using the causes of its existence: tax burden, regulation intensity, economic freedom index, business freedom index, unemployment rate, GDP per capita, declining tax morality and indicators reflecting its existence: GDP growth, labor force participation rate and currency demand

2. Based on the currency demand method proceed to an estimation of the starting values of the shadow economy and then use it to calibrate the relative estimates into absolute ones.

3. Estimate the parameters of the MIMIC model by the Maximum Likelihood method (ML). Thus, the time series index of the size of the shadow economy is estimated.

4. Calculate this time series MIMIC index (equation (1)) by multiplying the coefficients of the significant causal variables with the respective time series.

5. An index of the trend of the size of the shadow economy is produced. Thus, the changes in the ratio of the size of the shadow economy from year to year is given.

6. Benchmarking: calibrate the index in order to calculate the size of the shadow economy as percentage of GDP.

Although this method is appealing, it has a disadvantage including:

- The most common criticism is around the meaning of the latent variable. It's a confirmatory approach and not an exploratory approach in other words it's used to determine whether a certain model is valid than to find a suitable model. Therefore, it is possible that this model includes potential definitions of shadow economic activities such as illegal activities. For example, it is difficult for a researcher to confirm that illegal activities such as drug dealing are completely excluded from analysis of the shadow economy.
- Only relative coefficients (no absolute values) are obtained. Hence, we need another approach to normalize these estimates and their validity depends on the reliability of this second approach. Consequently, it is very difficult to draw statistically confirmed conclusions about the causal relations in the real world.

- The estimations are quite often highly sensitive with respect to changes in data and specifications
- Difficulties in differentiating between the selection of causes and indicators,
- The calibration procedure have a great influence on the results
- Starting values used have a great influence on the results.

The need to use other macro approaches like the currency demand approach to measure the size of the shadow economy independently from the causes used in the MIMIC model. Hence one can check whether a tax increase leads to a rise in the shadow economy.

- The economic literature using MIMIC model is well aware of these limitations. It highlights that the best statistical method can obviously not produce reliable empirical results about the shadow economy. However, it assumes that the MIMIC approach shouldn't be abandoned. On the contrary, future research should therefore concentrate more on the MIMIC method which is a great method when studying the shadow economy. In two words the limitations mentioned shouldn't be reasons to abandon this method but should be reasons for further research in this field.

III. Direct approaches

These approaches, which are also called microeconomic approaches use well designed surveys or tax auditing, they provide detailed knowledge about the shadow economy on an individual basis.

1. Household surveys

Surveys are the most obvious way to collect detailed data which can be obtained about the structure of the shadow economy. Although this method is appealing, it has several weaknesses:

- It will never yield reliable results because the nature of this subject is delicate.
- People will never admit all their hidden activities, even if anonymity is guaranteed.

In other words, the average precision and results depend greatly on how the questionnaire is formulated and on the respondent's willingness to cooperate, it is difficult to assess the amount of undeclared work from a direct questionnaire, most people who are involved in shadow activities refuse to co-operate and hesitate to admit their fraudulent behavior, and responses are of uncertain reliability. Thus Such activities are very difficult to measure in an interview

It is also true for activities of an administrative nature, for example not declaring interest on savings. In an interview, it's not simple and easy to detect such activities because of the difficulty of interviewees' willingness to admit their act and to co-operate because of their problems in recalling how much interest was received in a previous year. However, surveys can be successful if it focuses on the shadow labour market. The first reason is that many people are involved. The second reason is the fact that hiring oneself out is remembered afterwards much better than for example the receipt of interest. The third on, doing additional work in shadows is, in certain countries such as The Netherlands, often considered as only a minor infringement. Thus, it may be assumed that at least part of people working in shadows are willing to collaborate with the interviewers.

Results of survey research on shadow activities must be interpreted very carefully because the non-response may be selected. Such non-response is difficult to reduce, and then it will likely provide lower-bound estimates of the shadow economy

2. Tax audit

Tax auditing is another direct method used to estimate the size of the shadow economy, it's based on selective checks to measure the amount of undeclared taxable income. Thus a measure of the non-observed shadow economy.

Although this method is appealing, it has several weaknesses:

- Tax auditing is equivalent to using a sample of the population. Generally speaking, the selection of taxpayers for tax investigations is not random but is biased, in other words it's based on properties of submitted tax returns that represent a certain likelihood of tax fraud. So this sample is not a random one of the whole population.
 - Estimates based on tax audits will not reflect all portions of the shadow economy because investigations by the tax authorities can't uncover all tax evasion, and this is likely to be only a fraction of all hidden income. Thus, estimates based on this method generally underestimate the phenomenon "shadow economy".
 - Tax auditing provides only point estimates and does not offer estimates of shadow economy over a longer period of time.
- These two methods capture a good portion of shadow labor activities in households and rarely in or between firms. In addition Surveys and tax auditing are likely to provide lower-bound estimates of the shadow economy. However, they gather detailed data about shadow economy activities, the "shape" and composition of the activities as well as the socio-economic characteristics and incentives of individuals who are working in shadows.

IV. Other methods

These approaches do not use economic indicators, but use experience, expert's opinions. These approaches are: Observation and participation, Delphi method and Sensitivity analysis.

1. Observation and participation (USN, 1976)

Observation and participation or "participation at the grassroots" is a method often used in cultural anthropology. In this method in order to observe what they need for their research, the researchers go to the communities they want to study participate in it.

For example if researchers want to study the field of cigarettes smuggling, they need to observe and participate in smuggling, in order to do so they need to gain confidence of the smugglers and to make conversation with them so that they can be able to do their observation. Thus, based on their own observation and participation and so on, the researchers can be able to estimate the extent of the phenomenon.

Although this method is appealing, it has a disadvantage which is obtaining a result that is often not suitable to generalize because it can only be used to study a certain category or sector of the shadow economy within a relatively small geographic area.

2. Delphi method (Linstone en Turoff, 1975)

Delphi method is a method used to estimate the size and composition of the shadow economy based on the different opinions of experts. In other words it's a method to consult a carefully selected panel of experts on tax evasion and utilize their knowledge and opinions to reach an agreement about the size and structure of the shadow economy. This process involves many rounds:

- Information is collected from these experts by a written survey.
- All opinions are summarised and each expert need to interpret its own opinion.

- Their interpretation are collected, summarised and circulated again. This goes on till the experts have arrived at a certain level of agreement

Principles of this method:

- The experts who participate do not know who the other experts are and they do not meet each other. Thus there is no direct interaction between the members of the panel.
- There is no criterion in advance to decide whose opinion should weight most.
- Experts are allowed to change their mind.

3. Sensitivity analysis

Weck and Frey (1985) assumes that experts often have some knowledge of the size of the shadow economy in the different sectors of the economy. This knowledge, combined with information on the relative size of the sectors, can be used to get a picture of the sensitivity of the GDP for the existence of shadow activities. Weck and Frey divides these sectors into six categories. Each of these categories is sensitive to shadow activities in a certain way:

- Indirectly measured activities: Estimates of production that is indirectly measured are insensitive to the response behaviour of producers. For example, if production of agriculture is measured by experts who make an independent estimate of the crops, then the estimates of agricultural production is not affected by response behaviour of the farmers.
- Government controlled activities: Government, semi-government, banks and insurance companies are often well controlled by government. In many countries, these sectors have little opportunities to keep activities hidden from observation.
- Large companies: Although large companies have the opportunity to participate in the underground economy, they in general have less risky ways to avoid taxation.
- Medium size companies: These companies have fewer opportunities to avoid taxation by legal means.
- Small companies and self-employed: The value added of these activities is often estimated using information on production and value added per employee of the medium size companies. So if activities are not observed in medium size companies it will also lead to an underestimate of the value added of small companies and self-employed. If further some of these small-scale activities are not observed, the underestimate is even bigger.
- Fiscal data: Activities, which value added is estimated by using fiscal data.

These methods based on expert's opinions and knowledge can obviously come up with more realistic result than the result given by other methods. However those methods cannot produce reliable empirical results about a phenomenon about which little is known. Future research is therefore needed to determine how the size and development of the shadow economy can be estimated.

Although there are many methods available that claim to measure the size of the shadow economy. There is no ideal method. All methods have serious methodological problems and weaknesses.

Section 2 Empirical investigation

Shadow economy in Tunisia is an important issue that attracts the attention of the Central Bank of Tunisia and many researchers because of its great influence on official economy growth,

public finance safety and government corruption. In this regard, we found necessary to try estimating the size of the shadow economy in Tunisia.

I. Data definition and sources

In our investigation, we use quarterly time series data relating to the first quarter of 2001 until the fourth quarter of 2018 relative to five variables, which are; Banknotes and coins in circulation, the inflation rate, Tunisian Monetary Market rate (TMM), real Gross Domestic Product (GDP_{real}) and Tax-to-GDP ratio. This investigation was augmented by two other variables to account for two shocks that significantly affected Banknotes and coins dynamics, namely: D1 reflecting the Tunisian revolution of 2011 and D2 reflecting the process of changing banknotes in 2013

All the data relative to this part are publicly available and collected from the Central Bank of Tunisia and Ministry of Finance.



Abbr.	Variables	Description
CT	Currency in circulation	Banknotes and coins in circulation in real terms (MTD)
YT	Real GDP	Gross Domestic Product at constant prices (MTD): A macroeconomic measure of the value of economic output adjusted for price changes
INFL	Inflation	The "Global Inflation rate (%)": A quantitative measure of the rate at which the average price level of a basket of selected goods and services in an economy increases over a period of time.
INT	TMM	"Tunisian Money Market rate in (%)" is the rate at which banks borrow and lend money to each other
TAX	Tax-to-GDP ratio	A measure of tax burden.
D1	Dummy 1	The Tunisian revolution of 2011
D2	Dummy 2	The process of changing banknotes in 2013
v	Velocity	The velocity of money is important for measuring the rate at which money in circulation is being used for purchasing goods and services. $v = \text{NGDP} / (\text{M1} - \text{EC})$
T	Taxes	Total tax revenue (MTD)
Def	Deflator	The ratio of nominal GDP to the real measure of GDP
NGDP	Nominal GDP	An assessment of economic production in an economy but includes the current prices of goods and services in its calculation.
M1	Monetary agregate M1	Coins and notes in circulation and other money equivalents that are easily convertible into cash
EC	Extra currency	The illegal money in the economy

II. Variables description

Variables	LCT	LYT	INT	INFL	TAX
Characteristics					
Mean	8,577404	9,591636	4,95839	3,842597	20,47861
Median	8,590135	9,642618	5	3,675178	20,24966
Maximum	9,054093	9,81486	7,263333	7,73333	24,85258
Minimum	8,098093	9,286094	3,236667	0,518367	16,40189
Std. Dev.	0,311089	0,167997	0,764896	1,578082	2,000096
Skewness (Degree of asymmetry)	-0,128068	-0,511466	0,588857	0,348089	0,290598
Kurtosis (Degree of flattening)	1,649317	1,938871	4,062592	2,921625	2,458059
Jarque-Bera	5,669847	6,517156	7,548344	1,47242	1,894462
Probability	0,058723	0,038443	0,022956	0,478926	0,387813
Observations	72	72	72	72	72

- According to the analysis of the standard deviation, we note that the five series are highly scattered.
- Skewness measures the degree of asymmetry of the series' distribution around the mean. For the current study, the three series INT, INFL and TAX present positive Skewness. Therefore, they are asymmetrical on the right. However, LCT and LYT present negative Skewness. Therefore, they are asymmetrical on the left.
- Kurtosis indicates the degree of flattening of the series compared to normal, the judgment is made with respect to the value three. In the case where the Kurtosis is greater than 3, the series is considered higher than normal, it is called leptokurtic is the case of the series INT. When the Kurtosis is less than 3, the series is rather flat compared to the normal, it is called platykurtic this is the case of series LCT, LYT, INFL, and TAX.
- The Jarque-Bera is the statistic that determines whether the series in question is a normal distribution or not. In our case, the series LYT and INT are not normal distributions. However, LCT, INFL and TAX are normal distributions.

III. Empirical methodology

Estimating the size of the shadow economy requires an identification of the approach that it will be used. In our case, the selected approach is the “Currency demand” approach. This approach is one of the most commonly used indirect approaches. It was first used by Cagan (1958), who calculated a correlation of the currency demand and the tax pressure (as one cause of the shadow economy) for the United States over the period 1919 to 1955.

Cagan’s approach was further developed by Tanzi (1980, 1983), who econometrically estimated a currency demand function for the United States for the period 1929 to 1980 in order to calculate the shadow economy. Following Cagan’s work, a typical currency demand function can be written as:

$$C_0 = A (1+\Theta)^\alpha Y_0^\beta \exp(-\gamma i) \quad : \text{Equation (1)}$$

C is the observed cash, Y_0 the registered GDP, α, β, γ A parameters and Θ **the variable that gives incentives to make hidden transactions. This is the key variable of all currency models and it can be approximated using tax revenues to GDP,**

First step: Before proceeding with the estimation:

- Perform Augmented Dickey-Fuller Test (ADF test): Each series is individually examined under the null hypothesis of a unit root against the alternative of stationarity (Au. There are three likely outcomes:
Series are integrated of order 0. That is, stationary in level (this requires no differencing).
Series are integrated of order 1. That is, stationary after first difference.
Series are integrated of different orders. That is, having a combination of I(0) and I(1) series.
- If series are integrated of order 1 (must be I(1) not I(2)). That is, stationary in first difference. In this scenario, it is assumed that variables are stationary in first difference, that is, they are I(1) series (integrated of order one).
- Determine optimal lag length (p) for the model.
- Performing a cointegration test with (p) lags is necessary to establish a long-run relationship. Two prominent cointegration tests for I(1) series in the literature. They are Engle-Granger (Engle, Granger, 1987) and Johansen cointegration test. If we will perform Johansen cointegration test: Trace tests and the eigenvalue test would allow us to conclude how many cointegration relationships exist.
Note: Cointegration test should be performed on the level form of the variables and not on their first difference. It is okay to also use the log-transformation of the raw variables.
- Estimating the vector error correction model VECM: If non-stationary but I(1) time series are cointegrated, we can run the VECM to examine both the short-run and long-run dynamics of the series. The term, error-correction, relates to the fact that last period deviation from long-run equilibrium (the error) influences the short-run dynamics of the dependent variable. Thus, the coefficient of ECT, is the speed of adjustment, because it measures the speed at which LCT returns to the equilibrium after a change in the explicative variables.

$$\text{LogCT}_t = \beta_0 + \beta_1 \cdot \text{LogYT}_t + \beta_2 \cdot \text{INT}_t + \beta_3 \cdot \text{INFL}_t + \beta_4 \cdot \text{TAX}_t + \varepsilon_t \quad : \text{Equation (2)}$$

Regarding the sign of the variables in the model, we expect a positive impact on currency demand for Tax burden and GDP ($\beta_1 \beta_4 > 0$), and a negative effect from the part of interest rate and inflation rate ($\beta_2 \beta_3 < 0$).

➤ We have then obtain \tilde{C} : Currency demand for both formal and informal transactions.

Second step: After estimating the vector error correction model (VECM) and obtaining the coefficients for the long-run relationship of equation (2), we proceed to estimate the size of

shadow economy. Setting the incentive variable Q equal to the lowest tax burden, and leaving the coefficients of the other variables unchanged and we re-estimate the equation.

$$\text{LogCTt} = \beta_0 + \beta_1 \cdot \text{LogYTt} + \beta_2 \cdot \text{INTt} + \beta_3 \cdot \text{INFLt} + \beta_4 \cdot \text{TAXt} + \varepsilon_t \quad \text{Equation (3)}$$

➤ We then obtain \hat{C} : Currency demand for formal transactions.

Third step: The difference between \hat{C} and \tilde{C} is the amount of extra currency that measures the amount of illegal money in the economy.

Fourth step: The difference between these two variables \hat{C} and \tilde{C} give the amount of extra currency (EC) in the economy

$$\text{EC} = \hat{C} - \tilde{C} \quad \text{Equation (4)}$$

Fifth step: Following Tanzi (1983), we can assume that the velocity of money is the same in both formal and informal sector. $V_{\text{formal}} = V_{\text{informal}} = \text{GDP} / (\text{M1} - \text{EC})$.

$$V = \text{GDP} / (\text{M1} - \text{EC}) \quad \text{Equation (4)}$$

Sixth step: Once we estimate the velocity, we can obtain an estimate of the size of shadow economy (Y informal) by multiplying illegal money by the velocity of money

$$Y \text{ informal} = \text{EC} * v \quad \text{Equation (5)}$$

Last step: Using equation (5), we can infer the size of informal sector in formal GDP terms

$$Y \text{ informal} / \text{GDP} * 100$$

VI. Empirical findings

1. The estimation of the Vector Error Correction

In order to estimate the size of the shadow economy in Tunisia using the Currency demand method firstly, we need to perform stationarity tests on time series. Secondly, we need to perform the cointegration test. Thirdly, we need to estimate the Vector Error Correction Model (VECM). Finally, we can re-estimate the currency in circulation equation with the lowest tax burden. Once it's re-estimated, we proceed to the calculation of the size of the Shadow Economy in Tunisia.

- Augmented Dickey-Fuller test for unit root

Thanks to Augmented Dickey-Fuller (ADF), we tested the stationarity of existing series. Hence, the null and alternative test hypotheses are:

H0: The variable has a unit root

H1: The variable is stationary

The result presented in the table III.4 proved the acceptance of the null hypothesis of unit root for all variables. However, their first differences are stationary; therefore, all the variables are integrated at level of one.

Variable	ADF test at the level			ADF test at the first difference			Status
	t-statistic	Critical value at 5%	Decision	t-statistic	Critical value at 5%	Decision	
Real GDP	-2,038416	-2,902953	Non-stationay	-7,040529	-2,903566	Stationay	I(1)
Cash in circulation	-0,621252	-2,902953	Non-stationay	-9,265338	-2,903566	Stationay	I(1)
TMM	-2,204417	-2,903566	Non-stationay	-4,732391	-2,904198	Stationay	I(1)
Inflation rate	-0,403014	-2,905519	Non-stationay	-7,172854	-2,905519	Stationay	I(1)
Tax burden	-1,24797	-2,905519	Non-stationay	-5,341387	-2,905519	Stationay	I(1)

According to the table III.4, all the variables are not stationary, as well as having the same order of integration, we can use the co-integration technique to confirm the existence of a long run equilibrium relationship between the Currency in circulation, Real GDP, Tax-to-GDP ratio, the inflation rate, and TMM.

- Selection of the Lag length

In the aim of estimating the long and the short term relationship between different variables, a prior determination of the model order is required. To do so, we refer to Lag length criteria as Likelihood Ratio (LR) test statistic, Final Prediction Error (FPE), Akaike Information Criterion (AIC), and Hannan-Quinn information criterion (HQ). The optimal lag length is the one which minimizes the information criteria. Schwarz information criterion and Hannan-Quinn information criterion offered the minimal lag length, which is one lag as shown in the appendix I.3.

- Cointegration Result

The johansen co-integration test proved the existence of a stable relationship among currency in circulation, and different explanatory variables, hence the disequilibrium error would tend to be stationary and has a zero as a mean. The co-integration equation that expresses the long run dynamic is:

Equation 2: Long term dynamic equation

$$LCT_t + -1.17*LYT_t + 0.062*INT_t + 0.068*INFL_t + -0.123*TAX_t + 4.589 = \varepsilon_t$$

Based on the co-integration test, the equation defined above would be if ε_t is stationary; hence, the test for co-integration, exhibited in tableII, validate the previous assumption.

Table III.5 : Test for Cointegration

	t-statistic (ADF)	Critical value at 5%	Results
Residuals ϵ	-8,389615	-2,90766	Reject H0
Conclusion	The residuals of the long run equilibrium do not have a unit root. Therefore, Currency in circulation, inflation rate, TMM, GDP and Tax-to-GDP are differential are co-integrated.		

Therefore, the long run equilibrium that explains the level of gross foreign exchange reserves is:

Equation 3: The long run equilibrium of currency in circulation

$$LCT_t = -4.589 + 1.17 * LYT_t - 0.062 * INT_t - 0.068 * INFL_t + 0.123 * TAX_t + \epsilon_t$$

- If GDP increases by one unit, enhances the currency demand by 1.17 units.
- If tax-to-GDP ratio increases by one unit, the currency demand must grow by 0.123 units.
- If the inflation rate decreases by one unit, the currency demand must grow by 0.068 units.
- If interest rate decreases by one unit, the currency demand must grow by 0.062 units.

- The Vector Error Correction Model

The existence of one or more co-integration relationship motivates us to utilize the VECM as an appropriate method of estimation. This method has the credit to capture the existence of a mechanism of adjustment and its speed.

Table6: The Vector Error Correction Model estimation

Error Correction	ΔLCT_t	ΔLYT_t	ΔINT_t	$\Delta INFL_t$	ΔTAX_t
Adjustment	-0.093205	0.008999	-0.241687	0.005715	10.98078
ΔLCT_{t-1}	-0.090159	0.018340	0.054039	-1.088009	-8.110790
ΔLYT_{t-1}	-0.365705	0.040629	-3.843816	4.166786	14.14556
ΔINT_{t-1}	0.020672	-0.011517	0.556283	-0.122396	-3.016673
$\Delta INFL_{t-1}$	0.001784	-0.001944	0.073076	0.091128	-0.289609
ΔTAX_{t-1}	-0.010236	0.000288	0.004895	-0.017425	0.167350
C	0.014150	0.008231	0.044761	0.043111	0.155136
D1	0.049660	-0.014664	-0.329106	0.264448	-0.365037
D2	0.000786	-0.000832	0.026497	0.003841	0.146702

To sum up, after testing the validity of our model, it's proved that our model is valid and stable, and then it is able to capture the short run effects. In the light of this consideration, the speed of adjustment exhibited by the error correction term is significant at 10% level with a negative sign,

which confirm the existence of correction mechanism. The celerity of adjustment as defined by VECM is 0.093205, thus, around nine percent of the deviation from equilibrium is removed within each quarter. This speed is judged to be slow, which denotes that the return to equilibrium would be realized in slow pace and may take a long time.

Therefore, as expected, the estimated model which corresponds to equation (2), the coefficients for output, Tax burden and Gross Domestic Product have a positive long-run effect, while Tunisian Money Market rate and inflation rate take the pressure off the currency demand.

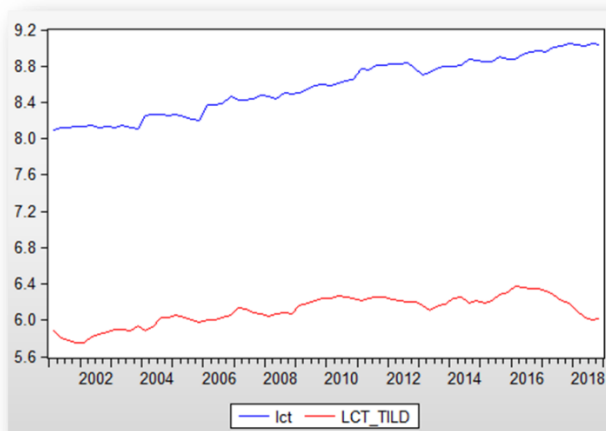
- Our work has given us; Tax burden is the only independent variable that has a significant impact on the dependent variable ($p\text{-value}=0.0012<5\%$). The positive and significant impact of the tax burden on currency demand can be interpreted in the view of (Tanzi,1983) as follows: as the tax rate rises, economic agents will be incentivized to divert the tax system. This is called "tax evasion". This practice is also ensured by the massive use of cash to circumvent traceability.
- The positive impact of real Gross Domestic Product on currency demand can be interpreted by the fact that increasing the wealth of the individual allows him to have more cash, all other things being equal.
- The negative impact of inflation on currency demand can be interpreted by the fact that an increase in the inflation rate leads the economic agents to move towards the placement of the cash they have in assets they find it profitable to grow their money and take advantage of the continued increase in prices.
- The negative impact of interest rate on currency demand can be interpreted by the fact that an increase in the interest rate leads the economic agents to pay more for their bank credits (consumer credits), they will then feel discouraged to apply for a bank loan; thus, a drop in currency demand.

2. The size of the shadow economy in Tunisia

After estimating the vector error correction model (VECM) and obtaining the coefficients for the long-run relationship of equation (2), we proceed to estimate the size of shadow economy. As we have noted the variable that gives incentives to make hidden transactions is high taxes. So now, the next step is setting the incentive variable TAX equal to its lowest value of 15%, to obtain the currency demand for formal transactions.

a. The estimation of the key variable: The tax burden in Tunisia

The impact of high taxes on the currency in circulation



The value of Tax burden
in Tunisia (2018)

23,2103%

In order to dress the causal relationship between high taxes and the amount of the illegal currency (Extra currency). We present in the following figure, the significant impact of tax-to-GDP ratio on the amount of currency in circulation. As it's presented, when taxes are high, economic operators tend to use more massively the cash "LCT". However, when we set the tax variable at its lowest value, we can notice a much lower amount of currency in circulation. To sum up, the higher the tax the more attractive the tax evasion becomes. In other words, to avoid high taxes, using cash is the only way to circumvent traceability.

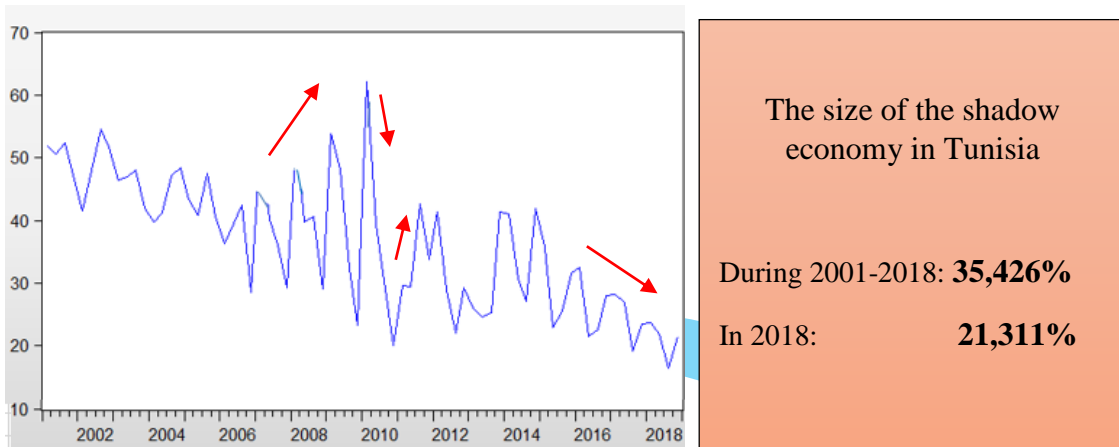
- We tried to determine the value of tax burden during 2001-2018; hence, our work has given **23, 2103%** as the value of Tax burden in 2018, a maximum of 24, 85258% and a minimum of 18, 51041%.

To push to analysis further, tax burden in Tunisia is the most important of the continent. This figure, when compared to the tax burden in the United States and Japan which is considered very high, as they are around 27%, even though they have a different social system from our system. In addition, if we compare to European countries. France and Germany have a tax burden of 40% (...) even though these countries have a level of health services and public facilities much better than ours.

- To sum up, tax burden is definitely the main cause of the evolution of the size of the shadow economy in Tunisia.

b. The evolution and the size of the Tunisian shadow economy

The evolution of the size of the shadow economy in Tunisia.



The results of the estimates make it possible to trace the evolution of shadow economy in Tunisia during from 2001 to 2018. According to the chart, we note that the level of the shadow economy is high in Tunisia with a peak in 2010. In addition to the high taxes, this is due to the illegal practices of the ousted president's family and the effects that are felt beyond the 2008 financial crisis because of the global financial and economic crisis that triggered an unprecedented wave of informality.

The social unrest experienced at the mid-year of 2010 put a lot of pressure on the former president, prompting him to take steps to absorb the tensions, which at the time, led to a decline in informality. However, on the eve of the revolution, there was a return to the growth of the shadow sector. This is explained by the amplification of contraband due to the absence of border controls with Algeria and Libya, as well as the increase in prices along with historically high levels of inflation, because as we all know, Tunisia has always been characterized by a moderate inflation rate compared to similar countries. However, since the revolution of 2011, several stylized facts have characterized the Tunisian economy: the first one lasts for periods of two years, from August 2012 until June 2014 where the CBT gradually tightened its monetary policy by raising the reference interest rate four times, from 3.5% (effective 5 September 2011) to 4, 75% in June 2014; this is what contributed to the deteriorating purchasing power of economic agents who have moved into the shadow sector.

The upward trend persisted over a long term (until 2016), indicating the failure or lack of effective policies targeting the shadow sector, leaving a large proportion of economic agents out of the legal sector. However, since 2016, it seems that Tunisian government and the CBT started to take small steps to develop long-term strategies in order to channel informal agents and their economic flows towards formality.

Chapter II: Strategies and Recommendations to fight the shadow economy

Introduction

This chapter summarises actions taken by the government and the Central Bank of Tunisia as well as recommendations for formalising the shadow economy. The policy recommendations that we highlighted are a set of preventive measures and incentives aimed at tackling the shadow economy which cover tax policy and regulation, the financial sector, etc.

In fact, the fight against shadow economy is not all about enforcing laws and punishing offenders, but also about making the formal sector more attractive (De-Cashing, Financial inclusion and FinTech Startups) and changing social norms for paying taxes. It's necessary to build trust in government and tax authorities so that citizens become convinced by the importance of paying their taxes. According to the World Bank (2012), "a good starting point is building good and trustworthy relationships between tax officials and taxpayers. (...) Improved and sustainable high levels of tax morale can only be achieved through a successful liaison of three factors: corruption control, the quality of institutions, and the degree of citizens' participation."

Section1: Strategies and legislative texts

I. Legislative texts to tackle S.E

1. The war against cash transactions: efforts undertaken by Tunisian taxation administration

The mechanism of rationalization of commercial operations carried out in cash instituted by the finance law for the year 2014

- Encourage companies to adopt means of payment that allow the traceability of such transactions (bank or postal transfer, check, draft, electronic payment, compensation) to improve transparency and control.
- Obligation of the companies to settle the value of their acquisitions made in cash and whose amount exceeds 20.000 DT within the framework of the commercial operations by the means of payment allowing the follow-up of the circuits of these operations ". The amount of 20,000 DT is reduced to 10,000 DT from 1 January 2015 and 5,000 DT from 1 January 2016.
- The seizure of cash amounts greater than or equal to 10,000 DT whose origin is not justified instituted by the supplementary finance law for the year 2014.

Contribution of the 2019 Finance Law

Article 45 of the Finance Law for 2019 introduced the following provisions to regulate cash payments exceeding TND 5,000, including the obligation of the competent municipal authorities to refuse to legalize the signatures of parties to contracts for the sale of immovable property, business assets or means of transport for which the price is paid in cash.

2. The framing of cash transactions in non-tax texts

Taxation is not the only legal discipline to be allergic to cash ... We have identified a few other non-tax texts that regulate cash transactions, including:

- Payments by electronic payment card are governed by the law n ° 2005-51 of June 27, 2005
- Law No. 2000-57 of 13 June 2000 amending and supplementing the Code of Obligations and Contracts (Article 453), then Law No. 2000-83 of 9 August 2000 on Trade and Electronic Commerce. Law No. 2001-1 of 15 January 2001 promulgating the Telecommunications Code.
- Law No. 2005-51 of 27 June 2005 on the electronic transfer of funds.
- Organic Law No. 2015-26 of August 7, 2015, relating to the fight against terrorism and the repression of money laundering, which stipulates that legal persons must refrain from receiving any cash money whose value is higher or equal to five thousand (5,000) dinars, even by means of several payments likely to have links.
- Circular of the Central Bank of Tunisia No. 2018 -61: Rules governing the activity and operation of payment institutions.

I. Central Bank of Tunisia strategies: Financial inclusion and De-cashing

In addition to the need to establish a **supervisory function** within the *Central Bank of Tunisia* through a **regulatory framework** and the need to initiate additional **education efforts**, the activity of payment institutions is a continuation of the national efforts initiated by the Central Bank, the Government and the banking sector for de-cashing and financial inclusion. Recently, “*Viamobile*” filed an application for approval as a payment institution with the *Central Bank of Tunisia*.

1. Payment institutions

This new entrant into the financial sector will be given prerogatives such as remote knowledge of customers, the possibility of approaching marketing with an innovative and liberalized approach, etc.

Compared with the banks, the payment institutions have unique opportunities to absorb the cash in circulation in the interior regions where the presence of the banks is weak as 73% of the banking agencies are concentrated in Greater Tunis, Nabeul, Sousse, Monastir and Sfax.

It is true that the presence of the Post Office fills this gap relatively, but there is significant growth potential for these institutions. The ability to open accounts electronically will enable rapid development without necessarily resorting to a physical branch.

In addition, payment institutions will be able to include more young people in the formal financial sector (Students and young professionals) as they will be able to access basic services at a lower cost.

And so it is clear that the payment institution is a lever for inclusion and de-cashing through the distribution of banking products and services including payment cards, prepaid electronic money issued by banks and the post.

2. FinTech Start-Ups : A threat to traditional banks

Recently, the *Central Bank of Tunisia* launched a national competitive bidding to implement the “*BCT-FinTech*” website and develop an Information technology (IT) application to manage the **FinTech*** Financial technology, database.

A *BCT-FinTech* commission is in the process of being set up by the Central Bank, which constitutes a sort of laboratory dedicated in its entirety to FinTech. The objective is to allow a better understanding and mastery of new technologies etc

What is a FinTech Start-Up?

Is it then a game changer for financial inclusion?

The term FinTech refers to companies, generally startups that operate in the field of technological innovation, applicable to financial and banking services. Their field of action ranges from alternative financing of companies, up to online payment, through savings management, loans, aggregators of bank accounts, etc.

In fact, a lot of borrowers become simply considered as insolvent and cannot access finance, because, in order to estimate their financial credit history, their banks follow traditional methods like asking for information about the applicant's repayment discipline. However, Fintech advances enables borrowers without significant wealth or assets to get a loan, something traditional banks won't do. This is possible through data and efficiency because platforms use alternative data sources, such as artificial intelligence, big data and machine learning. For example, scoring programs that look for all kind of data about the person (history, data from social networks, predictive information etc). Relying on all sorts of data, they can offer products tailored to their customers, for example providing loans based on cash flow and not on collateral. So we need:

- To teach financial literacy to all sorts of communities
- Entrepreneurs building FinTech platforms with consumer protection principles at the core
- Private investors helping to capitalize and grow these Start-Ups responsibly
- Bank executives who are looking at FinTech as a promising area of investment to think about the communities they are serving.

Speaking long-term, the expansion of FinTech in Tunisia will significantly boost financial inclusion and accelerate economic growth by creating a system that is more inclusive and equitable for everyone.

3. The development of the electronic payments

a. Payment via internet/mobile

On the initiative of the Banking Community, a contractual arrangement is proposed by the Tunisian banks to their customers. Already implemented, payment via internet aim to improve payment terms for online purchases by credit card. In other words, in Tunisia, payment via internet enables holders of credit cards to make purchases of goods and services from shopping malls on the Internet in maximum security conditions and it also enables students to pay their school fees via internet

Regarding mobile money services, which is a phenomenon that has emerged just a few years ago, it is one of the most crucial actions against cash payments. Today, as never before, countries must take advantage of the growing number of mobile phones in developing and developed countries, as well as the potential of the mobile platform to help meet the needs of individuals and small businesses.

“Mobile Money”: The term e-money is used in the broad sense to refer to sums of money stored in mobile phones using as the identifier the SIM card of the phone, rather than an account number as what is done for traditional banking services. Specifically, these sums of money are issued in virtual form by an entity (a mobile network operator) and are kept in an electronic account on the SIM card of the mobile phone, which is also used to make bank transfers or payment orders, while the cash consideration is held elsewhere, in a safe place, normally in a bank. The user can access the balance of his electronic account from his mobile phone.

Tunisia is among the three African countries most connected to the mobile and internet network. The smartphone is omnipresent and has even supplanted computers. Better late than never, Tunisian banks, on the lookout for this opportunity, have decided to embark on the adventure of mobile payment!

In fact, the Governor of the Central Bank called for the diversification of means of payment.

The president of the Tunisian Professional Association of Banks and Financial Institutions wants to launch a mobile payment system without contact. The operation will take place in partnership with the company “Monétique-Tunisie” (SMT) and will offer payment, transfer make transactions with the smartphone, regardless of your operator or your bank.

In fact, the advantages of the electronic payment services are:

- New opportunities to better secure access to financial services.
- Penetrating deep into hitherto marginalized rural areas, to address the lack of financial inclusion and to change the order of things.
- Allow those who do not have bank accounts to access a greater ease of payment. Hence the number of bank accounts in Tunisia will be less than the number of telephone subscriptions (The phone will be able to be connected to a prepaid card)
- Banks will be the big beneficiaries due to new revenue increase.
- The state will see an inclusive effect for all informal transactions and new sources of tax revenue.

The limits of which we will have to focus on, to develop electronic payments:

- The distrust of Tunisians vis-a-vis the electronic payment that is no longer to demonstrate.
 - The instability of the internet network, as evidenced the recent breakdown of the “Tunisie Telecom” operator.
 - Etc
- b. The generalization of the point of sale (POS) terminals

The development of the means of payments will have for role the establishment of an action plan aiming at the extension of the domain of the electronic payments and thus the diffusion and the generalization of the point of sale (POS) terminals in all points of sale of goods and services of public and private sector organizations.

The suspension of payment in cash and its replacement by the point of sale (POS) terminals will facilitate the collection of all flows by the tax authorities because it will certainly pass through the banking system. This is simple to set up. It's not expensive for the taxpayer and it's a “big” money to the state. Hence, we win on all fronts and particularly in terms of good practices. It is a miracle recipe to bring back the abundant resources of the informal to the banking circuit.

In addition, in order to discourage the use of cash and to increase popularity of electronic payments, it's important to think about:

- Organizing unscheduled inspections in companies to verify that card terminals and other related infrastructure work correctly
- Developing adequate infrastructure for bank cards and other electronic payments, particularly in the service sector and in rural areas.
- The important role of the State in the requirement of the settlement of certain public goods and services and payments by the Administration via electronic means.
- The revision of the terms and conditions, procedures and tariffs for electronic payments, the improvement of the quality and availability of payment services.

c. Review the ATM system

Review the ATM system to reduce the frequency of breakdowns.

These distributors must be well fed by banknotes to avoid the lack of liquidity especially during weekends and holidays.

During the day, the bank's agents must check the ATM network to make sure that the banknotes are still available and that there are no failures noticed.

It is also a way to encourage the use of debit cards in stores and generalize electronic debtors in all businesses to reduce cash.

It is not normal, in the era of digital and advanced technologies, to continue to work archaically by demanding cash.

4. The gradual withdraw of 50 D banknote

The 50D (2008) banknote was first issued in 2009 after ordering 24 million banknotes to replace the 30D banknotes expected to be withdrawn from circulation, streamline cash and meet requirements of the economy in a growth trend at this time (this type was removed from circulation in 2013 and demonetized in late March 2018).

In 2011 and following the decision to replace all the banknote denominations bearing the symbols of the former regime, 70.3 million banknotes 50 D type modified and issued in 2011, were then made.

The current situation (September 18, 2018) of the 50D banknote is as follows:

50 D denomination	Stock at CBT	Banknotes in circulation	The share as a proportion of total cash in circulation (%)
In volume of banknotes (in millions)	6,8	60,8	9%
By value (MDT)	344	3 040	25%

The proposal to withdraw the 50 dinar banknote as a means of fighting against the informal and the smuggling has been mentioned and discussed since December 2016 and that preventive measures were then taken by the CBT, namely the printing of an additional amount of the new 20 dinar banknote in order to be able to cope with a possible decision to withdraw the 50 dinar banknote upon their return to counters of the CBT.

This last measure had an effect on the regression of this note into the cash circulation as follows:

Dates	Banknotes in circulation by Value (in millions of dinars)	Banknotes in circulation by number (in millions of notes)	% in fiduciary circulation by value	% in fiduciary circulation by number
30/06/2016	3.303	66	35%	14%
30/06/2017	3.300	66	31%	11%
30/06/2018	3.126	63	27%	9%
18/09/2018	3.040	60	25%	9%

Section2: Recommendations to tackle shadow economy and the tax evasion

Central Bank of Tunisia, Tax administration, Ministry of finance, taxpayers and “Monétique-Tunisie” (SMT) etc should have overarching strategies for dealing with the shadow economy, recognizing that the most effective strategies were likely to be multifaceted and systemic.

I. Digitalizing the tax administration and certain sectors

1. Simplicity of compliance with tax administration

The purpose of this objective is making registration and the payment of tax easier. A number of countries have made registration automatic and combined it with registration for other government services.

For example, in Japan: In order to keep track of their taxes and prevent crimes such as tax evasion and to improve the fairness of the social security and tax system, from October 2015 all Japanese citizen or a foreign resident who will be staying in Japan longer than three months are issued with a unique identifier, known as “My Number” (マイナンバー). It’s composed of 12 digit numbers which will in theory be permanent and serve as identification for the purposes of taxation and social security administration

“My Number” (マイナンバー)
The Japanese notification card



Front side	Back side
(1) Notification card (2) Individual Number (3) Name (4) Address (5) Date of birth (6) Sex (7) Date of issue	(1) Notes <ul style="list-style-type: none"> ● It is prohibited by law that a person other than those who are permitted by law to copy the Individual Number. And for the ones who falsified any matter stated on this card is punished by law. ● If you have found this notification card, please kindly get in touch with the following contact; Call Center for the Social Security and Tax Number System (nation-wide common Navi-Dial Service) Phone: 0570-783-578 ● You have to return this notification card to the municipality upon receiving your Individual Number Card. (2) Individual Number

2. Reducing opportunities/increasing detection of tax evasion

Matching data through the transaction chain

New initiatives on macro and micro data might help to shrink the shadow economy activities, for example through the pre-filling of tax returns, where information is less complete or where criminal activity is involved. Hence, actions will be enforced and the proper use of investigations will be monitored.

In addition, to increase detection of shadow economy activities, it will be of great use to record data in digital form by suppliers, financial intermediaries and government and then matching it with other information related to an individual or business through the transaction chain.

These data can be classified into four types:

- Behavioural data: data related to taxpayers' interaction with the tax administration such as tax returns, late payments, etc
- Transaction data: data related information on the parties to the transaction: on sales and payments.
- Operational data: data on identity, status, location, etc.
- Open data: data which is open to public view, such as social media.

When tax administrations access to those data, it will be easy to enable reporting of taxable income or to reveal under-reporting or unreported taxable activity.

For example, in Peru, two major goals of SUNAT (National revenue authorities) are to improve revenue collection and reduce tax evasion. In 2015 SUNAT research identified individuals who had credit in the financial system and matched this data against taxpayers registered in the tax administration, so if a person who borrowed through the financial system did not have a tax ID number could be identified, was considered as a potential tax evader. Based on 2014 information, this research pointed out 1.8 million "informal individuals", representing 19.2% of the total client base.

- ✓ Of course, there are limits to the ability of data alone to tackle the shadow economy because there is the use of cash and the misuse of technology, however combined with other strategies it can make significant attack.

However, because of the growth in this illicit market supporting fraud, tax administrations need to continuously monitor developments as new technologies to tackle all kind of the shadow activities. Many tax administrations need then to explore a new set of technologies:

Biometric data, digital signatures: these are types of technology to fight ID fraud because of criminals who are migrating to more sophisticated multistep frauds.

Block chain technology: Block chain is, effectively, a distributed ledger that records, the details of transactions in real time and gives assurance that the required business rules are respected without the intervention of another party for control.

Fingerprint, iris, face and voice recognition: present an enhanced authentications to combat identity theft and strategic policy tools for social and financial inclusion.

As an example, the Indian government has built a nationwide biometric database based on fingerprints and iris scans for more than a billion residents, this database is unique and robust enough to eliminate fake identities. Those residents are issued with a 12 digit identity number "Aadhaar number" which is used as a tool for financial inclusion. Recently, the use of this number is being mandated for income tax returns and other applications.

Necessary informations to get an "Aadhaar number"

Demographic informations	Name, Date of birth, Gender, Adress, Mobile Number, E-mail, The name of the introducer' Aadhaar number, Name of head of family, head of family's Aadhaar number etc
Biometric informations	<ul style="list-style-type: none"> • Ten Fingerprints • Two Iris Scans • Facial Photograph

3. E-payment of salaries/Wages, social security benefits and certain services

In order to limit the shadow economy it would be perfect if a regulation introduces the obligation or create incentives for companies to pay the salaries of their employees into a bank account and to make an electronic payment of social security benefits.

If so, this regulation will be performed via a bank transfer, though it is possible to allow payment also in the form of prepaid cards. Then, the employer can load prepaid payment cards with the net salary/wage and give them to employees who can use the card for their everyday payment transactions in the same way as a regular debit or credit card.

In addition, The regulation of the electronic payment of social security benefits, obliges the government to pay at least some kinds of social security benefits in the form of electronic payments, for example through bank transfers and/or prepaid cards.

Recently, certain services are chosen by “Monétique-Tunisie” (SMT) as the first selected types of businesses to operate POS terminals which are devices that enable customers to settle their payments with payment cards. In this context, a regulation should oblige other types of businesses or sectors to operate POS terminals. This should be most effective in the sectors accounting for a high share of the total shadow economy, and for business activities in which the prevalence of POS terminals is currently relatively low.

Bookstore owners now have the possibility to pay for their purchases of school supplies by electronic payment. The National Pedagogical Center and “Monétique-Tunisie” (SMT) recently signed in the presence of Tunisian Minister of Education Hatem ben Salem, a partnership agreement to allow booksellers to pay via an e-card for the purchase of government-subsidized textbooks, books and school supplies. This measure would make it possible to fight against the diversion of school supplies and especially subsidized notebooks, from the formal circuit.

II. Reinforcing social norms

There are two aspects to strategies to promote social norms, the first one is convincing workers in the shadow sector to comply with tax obligations, and the second is reducing opportunities for noncompliant behavior.

1. Education

In order to tackle issues related to shadow economy, workers in the shadow economy should be educated about the damage caused by those issues to the funding of public services and to society more widely. They should understand its negative impact on public budget (health budget, education budget or social infrastructure etc.) and that it's considered as great waste, they should also take in consideration how this loss tax revenue depends on the individual actions of customers and employers who may be fully compliant in their own tax matters. As an example, we have the educational campaigns, in other words it will be of a great use to educate students about the requirements of the tax system and the bad effects of the shadow economy.

In addition, in order to tackle shadow economy activities effectively, tax administrations should focus on the different categories of behaviour of taxpayers.

In fact, there is the voluntarily category of compliant, the unaware taxpayers who are willing and want to comply with tax administration but due to their lack of knowledge and understanding of their tax obligations, they can't do so, there is also the negligent category of taxpayers who are willing to comply with tax obligation but they don't allocate sufficient attention to it and the errant category of taxpayers who intentionally evade taxes.

Tax administration should now try with its tools to change those behaviours.

As an example, we can think about encouraging taxpayers to review their tax declarations and if they do so, they'll benefit from more lenient treatment. Another idea, which is trying to increase the public awareness and confidence in the fairness of tax system by sharing in the media that intentional fraud will lead to imprisonment and/or penalties.

2. Receipt lotteries

The idea of receipt lotteries is to reduce the shadow economy by limiting unreported transactions through the increased issuance of receipts "business-to-consumer" transactions. In other words, creating an incentive to make consumers asking for a receipt, as it will give its holder a chance to win attractive prizes.

It is assumed that, in the longer perspective, this measure aims to get consumers used to asking for fiscal receipts and after a certain period of time, people will develop such a habit even without such an attractive incentive.

As an example of the use of national receipt lotteries, there is from Taiwan, Slovakia, Malta and Portugal.

3. Symbolic tax

"It is urgent that they come up with laws that push progressively the people working in the informal sector to gradually get integrated into the formal one."

Years ago, certain municipalities worked hard to provide the street vendors with a space where they can sell their goods. To our surprise they abandoned the space offered to them saying that the place wasn't visible enough for people to see them and the situation now is even worse.

Many municipalities have done the same but it seems that these street vendors are not cooperative.

So it's clear that integrating street vendors in the formal economy does not make a drastic solution. First, not all of them accepted to be integrated. Second, the ones who accepted to be integrated, hundreds will replaced them.

So the only solution is to issue some regulations and provide the minimum control of the products sold by hawkers, for example, pushing them to give a symbolic tax to provide for the cleaning services.

III. Encouraging and facilitating import/export transactions

1. Simplification of import procedures and revision of the taxation system of the main products of the parallel economy

One of the causes of the development of the shadow economy is the draconian import procedures imposed by the government on imports. Traffickers take advantage of differences in the tax regime for certain products with neighboring countries or of subsidized products on both sides of our borders to maximize profits. The government should:

- Review import procedures for foreign products and streamline them.

- Review the tax or subsidy systems applied by setting up a study and analysis unit within the customs department, which will be in charge of identifying the preferred products by traffickers and fraudsters and which can be the proposal to the government to revise these regimes, hence to pull the carpet under the feet of fraudsters.
- Periodically and randomly rotate all customs and police officers and officers who work in major ports / airports and high-risk border areas.

2. Free-trade zone

There are three categories of free zones, the first category is the free trade zones, usually located near seaports or airports, offer exemptions from national import and export taxes on re-exported goods.

The second category is the special economic zones apply a multi-sectoral strategy and are geared towards both domestic and foreign markets. They offer a wide range of incentives, in the form of infrastructure, tax exemptions and tariffs, and simplified administrative procedures, and

The third category is the industrial zones are specialized in particular economic activities, such as media or textiles, with adapted infrastructures.

At the international level, Jebel Ali, a deep-water port in Dubai created in 1985, is one of the most successful free-trade zone. The activities and goods concerned were exempted from import duties, as for Tunisia, there are two free zones in the north and south (Bizerte and Zarzis).

In fact, one of the main objectives of the creation of free zones is to increase exports, most of them are exempted from national import and export duties, or officially operate outside of customs area of their host country. Governments often add other benefits to these privileges, such as fiscal, regulatory, administrative and financial incentives.

It is clear that it is important to create two free trade zones, at the Tunisian-Libyan border and on the Algerian borders to promote investment in developing countries and to create jobs to fight against the shadow economy.

The creation of free zones must always be accompanied by a policy to attract companies and convince them to settle. This policy can go through a wide variety of benefits in addition to customs exemptions:

- Provision of serviced land;
- Guarantee of privileged treatment vis-a-vis local administrations;
- Partial or total tax rebates, whether temporary or permanent;
- Etc.

3. International co-operation

Shadow economy activities carried out across borders is on the rise and at the same time it exploits weaknesses in international co-operation, however, this can be mitigated by greater sharing of data in real time, thus a more effective and efficient ways to deal with it is necessary. As a proposal, Mr. the Central Bank Governor emphasized the need to further strengthen regional cooperation through the development of a common agenda for the promotion of digital payments to boost financial inclusion, with the concrete initiative of implementation of a digital platform for cross-border payments.

VI. Experts' recommendations

1. Immediate withdrawal of 50 dinar banknotes

In order to tackle the informal sector, the deletion of the 50 dinar banknote seems to present a great solution because this denomination **advantages**? However, deleting it with immediate application with the obligation to pay the banknotes into a bank or postal account in the name of the person making the payment, is one of the solutions presented by some experts leads to the following constraints.

On the technical side:

In case of adoption of a decision to withdraw, this operation would require upstream a preparatory period to evaluate based on the terms of exchange that will be established (exchange with opening a bank account, with or without threshold of exchange, exchange at the counters of the CBT, ...) for the verification of the stock of new banknotes of 20 dinars available to the Central Bank of Tunisia and which will be used to replace the 50 dinar notes (at least a year and a half) and supply branches, and if necessary, supply banks with banknotes to replace the withdrawn notes. This decision would also require time for processing 50 D notes withdrawn and paid by banks and the destruction of the said notes.

Legally:

The withdrawal of the 50 dinar banknote by a decision with immediate application, which means from the moment of the publication of the decision, necessarily implies that the Central Bank takes a decision immediately terminating the legal tender of this banknote.

However, a decision in this regard seems contrary to the terms of paragraph 5 of the article of Law No. 2016-35 which indicates that the CBT has set a deadline by which the withdrawn banknotes lose its legal tender and contrary to the principle of the legitimate expectation which obliges the authority to give citizens a reasonable period of time in order to comply with its decision.

In addition to the financial limit, the decision to suddenly withdraw large denominations to fight tax evasion will create panic and crisis in society and a deterioration of public confidence in the state. Thus this measure may trigger a rush on banks that will be dry and therefore lead to a slowdown in household consumption.

Furthermore, given the current level of inflation, it is considered preferable to keep the 4 cuts in order to ensure smooth transactions.

2. Changing the currency

Because of the deterioration of the economic situation, such as the decline in the rate of growth, investment and the marginalization of economic issues in the public dialogue, former Minister of Finance proposed *a statement to Express FM on Friday, August 30, 2019* changing the currency to tackle the shadow activities.

This initiative is based on two main objectives:

- The first is to push economic competencies to contribute more to put the economic issue at the core of the public debate,
- The second goal is to come up with practical proposals.

The proposals include the need to stop any new tax legislation in the next three or four years and work to "change the currency, which is necessary today to fight parallel trade and smuggling."

V. Other recommendations

1. Encouraging "to be your own entrepreneur"

Unemployment is either controllable by the government through economic policy in a traditional Keynesian sense, or the government can try to improve the country's competitiveness to increase foreign demand.

In addition, a government can also deregulate the economy or incentivize "to be your own entrepreneur", which would make self-employment easier, potentially reducing unemployment and positively contributing to efforts in controlling the size of the shadow economy.

These two policies need to be accompanied with:

- A strengthening of institutions and trust in public institutions to reduce the probability that self-employed shift reasonable proportions of their economic activities into the shadow economy, which, if it happened, made government policies incentivizing self-employment less effective.
- A focus to reduce overall taxation (especially indirect taxation and customs duties)
- A strengthening of the quality of institutions like creating democratic and transparent institutions with lesser regulatory burden and corruption in order to be able to restore the trust and confidence of the people in the public institutions.
- Reducing administrative burden on businesses by simplifying the procedures for obtaining licenses, accelerating the release of documents required for entrepreneurship, reducing bureaucratic barriers for such documents and increasing transparency of the whole process.

2. Central Control Directorate

The government needs to put in place a central management fighting the underground economy. It must play the role of coordinator or conductor of 4 key directions:

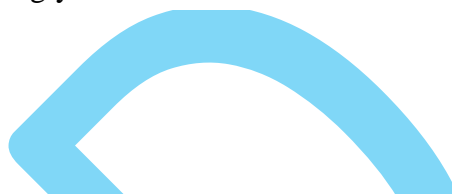
- Intelligence Directorate: This is a direction against parallel circuits with regional entities throughout the country or in risk areas. This directorate will be responsible for collecting information on the trafficking of goods illegally introduced into each region. It can be implemented under the supervision of the Ministry of Finance with the cooperation of the Ministry of the Interior. It may consist of senior officials of the Ministry of Finance, judges, police intelligence officers, customs officers, etc
- A regional intervention brigade: a brigade composed of field workers (police and special intervention gendarmes) who are able to intervene at any time to intercept the traffickers under the orders of the central direction and under the authority of the public prosecutor.
- A Directorate for Competition, Consumption and Fraud: a directorate that will be responsible for regulating competition in the market and protecting the economy and consumers. Its main role will be to monitor the market and identify goods and products that are sold illegally (non-duty free, non-taxed, etc.) and to impose heavy penalties on suspected traders. . This direction can be implemented under the supervision of the Ministry of Commerce with the cooperation of the Ministry of the Interior.
- A financial brigade: which will be in charge of handling the facts and suspicious transactions of money laundering. Its main role would be to analyze and cross-check information to identify financial movements connected to money laundering. This direction can also be implemented under the supervision of the Ministry of Finance.

There are certainly some of these directions in the current system. However, the effectiveness of these control directorates and intervention brigades lies in the coordination of their actions and in their collective cooperation. A real reorganization of the current control system deserves to be studied and implemented.

Conclusion

Fighting the shadow economy is no longer a choice for the government and Tunisians, it is an existential question. The Tunisian must adhere to this campaign at the risk of seeing his state collapse. At the same time, the government must work to reduce the social gap and invest in the interior regions in order to pass a strong signal of change, equity and thus gain the confidence of the Tunisian. The Central Bank of Tunisia must work further on the Financial inclusion, De-Cashing etc. Nowadays, the economic situation is becoming worrying. If everyone (citizens, government and CBT) does not take responsibility and does not get to work, we may slip into the case of Greece, something I will not wish for my country.

Hence, the importance of multifaceted and comprehensive strategies and the importance of international cooperation given the increasingly cross-border shadow economy risks.



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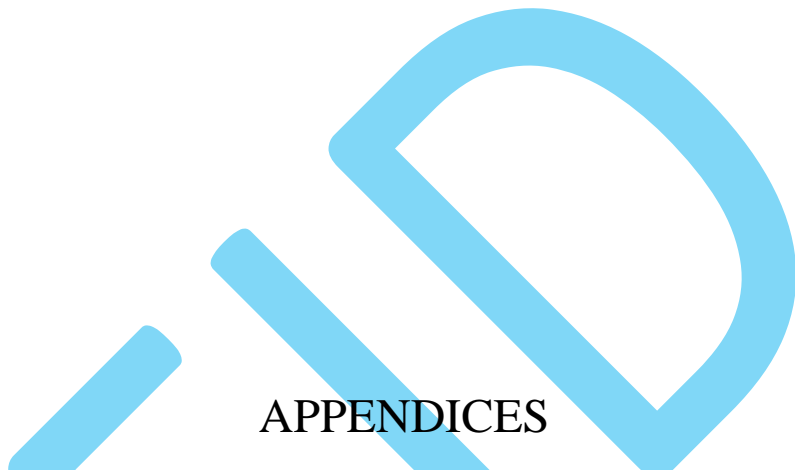
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APPENDICES

APPENDICES

Appendix I: Empirical investigation on the size of the Tunisian shadow Economy

Appendix I.1: Stationary tests at the level

Null Hypothesis: LYT has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.038416	0.2701
Test critical values:		
1% level	-3.525618	
5% level	-2.902953	
10% level	-2.588902	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: LCT has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.621252	0.8585
Test critical values:		
1% level	-3.525618	
5% level	-2.902953	
10% level	-2.588902	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: INT has a unit root
 Exogenous: Constant
 Lag Length: 1 (Automatic - based on AIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-2.204417	0.2066
Test critical values:		
1% level	-3.527045	
5% level	-2.903566	
10% level	-2.589227	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: INFL has a unit root
 Exogenous: Constant
 Lag Length: 4 (Automatic - based on AIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-0.403014	0.9020
Test critical values:		
1% level	-3.531592	
5% level	-2.905519	
10% level	-2.590262	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: TAX has a unit root
 Exogenous: Constant
 Lag Length: 4 (Automatic - based on AIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-1.247970	0.6488
Test critical values:		
1% level	-3.531592	
5% level	-2.905519	
10% level	-2.590262	

*MacKinnon (1996) one-sided p-values.

Appendix I.2: Stationary tests at first difference

Null Hypothesis: D(LYT) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on SIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-7.040529	0.0000
Test critical values:		
1% level	-3.527045	
5% level	-2.903566	
10% level	-2.589227	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(LCT) has a unit root
 Exogenous: Constant
 Lag Length: 0 (Automatic - based on AIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-9.265338	0.0000
Test critical values:		
1% level	-3.527045	
5% level	-2.903566	
10% level	-2.589227	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(INT) has a unit root
Exogenous: Constant
Lag Length: 1 (Automatic - based on AIC, maxlag=11)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-4.732391	0.0002
Test critical values:		
1% level	-3.528515	
5% level	-2.904198	
10% level	-2.589562	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(INFL) has a unit root
Exogenous: Constant, Linear Trend
Lag Length: 3 (Automatic - based on AIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-7.166790	0.0000
Test critical values:		
1% level	-4.100935	
5% level	-3.478305	
10% level	-3.166788	

*MacKinnon (1996) one-sided p-values.

Null Hypothesis: D(TAX) has a unit root
Exogenous: Constant
Lag Length: 3 (Automatic - based on AIC, maxlag=3)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-5.341387	0.0000
Test critical values:		
1% level	-3.531592	
5% level	-2.905519	
10% level	-2.590262	

*MacKinnon (1996) one-sided p-values.

Appendix I.3: Selection of Lag

VAR Lag Order Selection Criteria
 Endogenous variables: LCT INFL INT LYT TAX
 Exogenous variables: D1 D2
 Date: 11/16/19 Time: 19:25
 Sample: 2001Q1 2018Q4
 Included observations: 67

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-493.1730	NA	2.295136	15.02009	15.34915	15.15030
1	195.8585	1234.086	5.67e-09	-4.801747	-3.650042*	-4.346014*
2	223.5746	45.50407	5.32e-09*	-4.882825	-2.908473	-4.101569
3	248.0114	36.47284	5.61e-09	-4.866013	-2.069015	-3.759234
4	273.3778	34.07418	5.95e-09	-4.876948	-1.257304	-3.444646
5	305.2596	38.06792*	5.44e-09	-5.082378*	-0.640086	-3.324552

* indicates lag order selected by the criterion
 LR: sequential modified LR test statistic (each test at 5% level)
 FPE: Final prediction error
 AIC: Akaike information criterion
 SC: Schwarz information criterion
 HQ: Hannan-Quinn information criterion

Appendix I.4: Cointegration relationship

1 Cointegrating Equation(s):	Log likelihood	219.6281
Normalized cointegrating coefficients (standard error in parentheses)		
LCT	LYT	INT
1.000000	-1.172167 (0.22243)	0.061940 (0.03166)
		INFL
		0.067997 (0.02525)
		TAX
		-0.121636 (0.01481)
Adjustment coefficients (standard error in parentheses)		
D(LCT)	-0.093205 (0.03731)	
D(LYT)	0.008999 (0.00808)	
D(INT)	-0.241687 (0.20131)	
D(INFL)	0.005715 (0.60278)	
D(TAX)	10.98078 (1.41530)	

Appendix I.5: Cointegration test

Null Hypothesis: EPS has a unit root
 Exogenous: Constant
 Lag Length: 1 (Automatic - based on SIC, maxlag=4)

	t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic	-8.376011	0.0000
Test critical values:		
1% level	-3.530030	
5% level	-2.904848	
10% level	-2.589907	

*MacKinnon (1996) one-sided p-values.

Appendix I.6: Vector Error Correction Model

Vector Error Correction Estimates

Date: 11/08/19 Time: 15:36

Sample (adjusted): 2001Q3 2018Q4

Included observations: 70 after adjustments

Standard errors in () & t-statistics in []

Cointegrating Eq:	CointEq1				
LCT(-1)	1.000000				
LYT(-1)	-1.172167 (0.22243) [-5.26987]				
INT(-1)	0.061940 (0.03166) [1.95667]				
INFL(-1)	0.067997 (0.02525) [2.69314]				
TAX(-1)	-0.121636 (0.01481) [-8.21052]				
C	4.589289				
Error Correction:	D(LCT)	D(LYT)	D(INT)	D(INFL)	D(TAX)
CointEq1	-0.093205 (0.03731) [-2.49804]	0.008999 (0.00808) [1.11362]	-0.241687 (0.20131) [-1.20057]	0.005715 (0.60278) [0.00948]	10.98078 (1.41530) [7.75863]
D(LCT(-1))	-0.090159 (0.12476) [-0.72266]	0.018340 (0.02702) [0.67872]	0.054039 (0.67313) [0.08028]	-1.088009 (2.01554) [-0.53981]	-8.110790 (4.73238) [-1.71389]
D(LYT(-1))	-0.365705 (0.59494) [-0.61469]	0.040629 (0.12886) [0.31530]	-3.843816 (3.20996) [-1.19747]	4.166786 (9.61159) [0.43352]	14.14556 (22.5675) [0.62681]
D(INT(-1))	0.020672 (0.02227) [0.92811]	-0.011517 (0.00482) [-2.38746]	0.556283 (0.12017) [4.62912]	-0.122396 (0.35983) [-0.34015]	-3.016673 (0.84485) [-3.57065]
D(INFL(-1))	0.001784 (0.00793) [0.22510]	-0.001944 (0.00172) [-1.13259]	0.073076 (0.04277) [1.70864]	0.091128 (0.12806) [0.71159]	-0.289609 (0.30068) [-0.96317]
D(TAX(-1))	-0.010236 (0.00301) [-3.40548]	0.000288 (0.00065) [0.44250]	0.004895 (0.01622) [0.30186]	-0.017425 (0.04856) [-0.35886]	0.167350 (0.11401) [1.46785]
C	0.014150 (0.00728) [1.94384]	0.008231 (0.00158) [5.22083]	0.044761 (0.03927) [1.13970]	0.043111 (0.11760) [0.36659]	0.155136 (0.27612) [0.56184]

D1	0.049660 (0.02381) [2.08525]	-0.014664 (0.00516) [-2.84289]	-0.329106 (0.12849) [-2.56134]	0.264448 (0.38474) [0.68734]	-0.365037 (0.90334) [-0.40410]
D2	0.000786 (0.02062) [0.03812]	-0.000832 (0.00447) [-0.18626]	0.026497 (0.11123) [0.23822]	0.003841 (0.33306) [0.01153]	0.146702 (0.78200) [0.18760]
R-squared	0.216105	0.198368	0.432991	0.026826	0.598981
Adj. R-squared	0.113299	0.093236	0.358629	-0.100803	0.546388
Sum sq. resids	0.088248	0.004140	2.568937	23.03267	126.9754
S.E. equation	0.038035	0.008238	0.205216	0.614479	1.442762
F-statistic	2.102063	1.886850	5.822749	0.210188	11.38905
Log likelihood	134.3378	241.4210	16.34941	-60.42035	-120.1681
Akaike AIC	-3.581080	-6.640601	-0.209983	1.983438	3.690518
Schwarz SC	-3.291987	-6.351509	0.079109	2.272531	3.979610
Mean dependent	0.013209	0.007506	0.017012	0.081124	0.062189
S.D. dependent	0.040392	0.008651	0.256246	0.585669	2.142163
Determinant resid covariance (dof adj.)		2.58E-09			
Determinant resid covariance		1.30E-09			
Log likelihood		219.6281			
Akaike information criterion		-4.846518			
Schwarz criterion		-3.240450			
Number of coefficients		50			

Appendix I.7: VECM validity tests

VEC Residual Serial Correlation LM Tests
Null Hypothesis: no serial correlation at lag order h
Date: 11/16/19 Time: 19:55
Sample: 2001Q1 2018Q4
Included observations: 70

Lags	LM-Stat	Prob
1	31.00749	0.1888
2	27.54483	0.3292
3	33.42458	0.1208
4	43.08218	0.0137
5	34.15382	0.1047
6	23.01465	0.5767
7	28.12975	0.3019
8	23.18203	0.5669
9	31.18751	0.1829
10	16.97538	0.8827
11	25.10499	0.4565
12	25.92293	0.4117

Probs from chi-square with 25 df.

VEC Residual Normality Tests
Orthogonalization: Residual Covariance (Urdua)
Null Hypothesis: residuals are multivariate normal
Date: 11/16/19 Time: 20:02

Sample: 2001Q1 2018Q4
 Included observations: 70

Component	Jarque-Bera	df	Prob.
1	95.36819	2	0.0000
2	1.540031	2	0.4630
3	11.30379	2	0.0035
4	3.729886	2	0.1549
5	2.752789	2	0.2525
Joint	231.1736	105	0.0000

VEC Residual Heteroskedasticity Tests: No Cross Terms (only levels and squares)

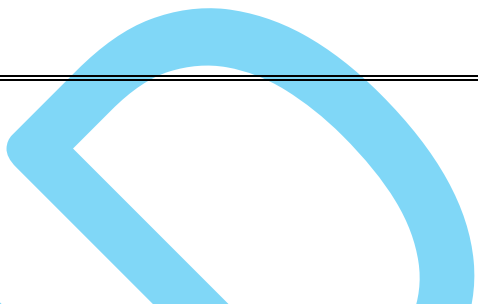
Date: 11/16/19 Time: 19:57

Sample: 2001Q1 2018Q4

Included observations: 70

Joint test:

Chi-sq	df	Prob.
170.8899	210	0.9777



Appendix I.8: Steps to determine the size of Tunisian shadow economy

```

EViews - [Program: PRG_INFORMEL -
File Edit Object View Proc Quick Options Add-ins Window Help
Run Print Save SaveAs Cut Copy Paste InsertTxt Find Replace Wrap+/- LineNum+/- Encrypt
genr lct_forecast=1.17*lyt-0.06*int-0.06*infl+0.12*tax- 4.589289
genr lct_tild=1.17*lyt-0.06*int-0.06*infl+0.12*15- 4.589289
genr ec=exp(lct_forecast)-exp(lct_tild)
genr v=GDP_NOMINAL/(m1-ec)
genr v_formel1=GDP_NOMINAL/(m1)
genr v_informel=v_formel1
genr PIB_informel=v_informel*ec
genr pct=PIB_informel/GDP_NOMINAL
genr lct_forecast=1.17*lyt-0.06*int-0.06*infl+0.12*tax- 4.589289
genr lct_tild=1.17*lyt-0.06*int-0.06*infl+0.12*0- 4.589289
genr ec=exp(lct_forecast)-exp(lct_tild)
genr v=GDP_NOMINAL/(m1-ec)
genr v_formel1=GDP_NOMINAL/(m1)
genr v_informel=v_formel1
genr PIB_informel=v_informel*ec
genr v_informel=v_formel1
genr PIB_informel=v_informel*ec
genr pct=PIB_informel/GDP_NOMINAL*100
genr pct_modif=1.17*pct
  
```


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