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Informal but not Insignificant: Unregistered Workers in North Cyprus

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Abstract

The size of the informal labour force and its contribution to the national income of North Cyprus has been an issue of considerable controversy and political significance. Because of the relatively free movement of labour between Turkey and North Cyprus, a significant body of unregistered workers have accumulated in North Cyprus. The findings are that from 1996 to 2000 the informal employment is between 35 to 40 per cent of the total labour force. Because not all the informal sectors production is excluded from the official national income statistics, the understatement of the official statistics is estimated to be between 12 to 17 percent of GNP. The fiscal losses are estimated to be about 9 percent of total tax revenues and a loss of social security revenues is approximately 38 per cent of the total annual contributions.

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I. Introduction

The size of the informal labour force and its contribution to the national income of North Cyprus is an issue of considerable controversy and political significance. After the 1974 war in Cyprus, the domestic labour force in the North was not sufficient to build the economic and social infrastructure for the establishment of the new state. Hence, the government had a policy of overcoming the shortage by inviting labour to migrate from abroad, specifically from Turkey. Furthermore, since 1991 travel for a period of three months between North Cyprus and Turkey has been allowed on the basis of only the presentation of one's national identity card. As a consequence the numbers of temporary migrants from Turkey to North Cyprus has increased. This circular flow of labour between Turkey and North Cyprus is very similar to flows of labour that have occurred for decades between Puerto Rico and the USA.[1]

Parallel with the increase in migrants, the propensity for local companies to employ labour with no work permits has also increased. Migrant labourers from Turkey tend to have lower supply prices as compared to the local Turkish-Cypriot workers. This is demonstrated by the lower wage rates and poorer working conditions that they are willing to accept. Informal employees are employed in virtually all of the economic sectors in North Cyprus and can be found working for the largest and the most modern of firms. Since the political interests opposed the growth of the informal labour force have not been strong, temporary worker regulations have only recently been put in place. Until now it has been market forces alone that have determined the working conditions and wage rates paid to this informal labour force.

The number of immigrants from Turkey to be allowed to remain in North Cyprus was a critical variable associated with in the negotiations that took place in 2004 between North and South Cyprus. It also has been suggested that the per capita of North Cyprus is significantly understated due to the extent of the informal sector (Besim, 2001). Hence, the gap in the incomes of the permanent residents of North and South Cyprus could be significantly smaller than what is reported in the official statistics for North Cyprus.

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[1] All citizens of Puerto Rico also have US citizenship there are no visa requirements. (Godoy, Jenkins and Patel (2003).

The political sensitivity of this issue is illustrated by the fact that throughout all of the negotiations of the Annan plan; no single number for the size of the resident population of North Cyprus could be agreed upon. The size of the per capita GNP of North Cyprus was also an equally illusive number (Annan, 2004). The purpose of this paper is to shed some light on these two questions.

II. Defining the Informal Sector

The informal sector is not simply a set of survival activities performed by people on the fringes of society. Studies in both industrialized and less developed countries have found that the economic dynamism of the unregulated activities of informal entrepreneurs, has sometimes allowed the informal sector to generate income above the level of workers in the formal economy (Schnider and Enste, 2000). The informal economy is not a euphemism for poverty. It is a specific form of organization for production, while poverty is an attribute linked to the process of income distribution.

The informal sector, which produces legal goods but does not comply with government regulations, is a part of most economies. According to Schneider and Enste (2000), it is estimated that in developing countries the informal sector employs up to 60 per cent of the workforce and produces nearly 40 per cent of GDP. Their estimates of the OECD countries put the level of informal employment at approximately 17 per cent of the total workforce, and it in turn accounted for about 14 percent of GDP.

There is strong evidence of the systematic linkage between the formal and the informal sectors in the pursuit of profitability. Individuals may switch between the two sectors even during the same workday, with a unionized auto worker moon lighting as a mechanic, or a policeman working off-duty as a magician or as a tattoo artist (Daily Mail, 2006). The informal sector is thus not an individual condition but a process of income-generation characterized by one central feature: it is unregulated by the institutions of the society, in a legal and social environment in which similar activities are regulated. There are many obvious, and not so obvious, links between the formal modern services and manufacturing industries in a country and the unregulated operations of the informal sector. In this respect, the growth of subcontracting in many countries is evidence of the linkages developing between the formal and informal sectors (Thomas, 1992).

In fact, it is because there is a formal economy (i.e., an institutional framework of economic activity) that one can speak of an "informal" one. In a market economy, with no regulation of any kind, the distinction between formal and informal would lose meaning since all activities would be performed in an informal manner. On the other hand, the more a society institutionalizes its economic activities and the more individuals try to escape this institutionalized work environment, the sharper the divide between the two sectors (Portes, Castells and Benton, 1989).

In the context of North Cyprus, the informal sector is defined as the portion of economic activity that, for one reason or another, fails to be recorded in the official national income accounts. The activities undertaken by the informal sector are perfectly legal and no laws are being broken in their operation, but they are not regulated, officially recognised and/ or audited by the authorities. From the fiscal point of view, these activities are neither reported to the tax authorities nor are they recorded with the social security system. This can cause a significant loss of tax revenue and social security contributions. At the same time these individuals usually do not enjoy the benefits of the social security system.

The measurement of the size of the informal sector in terms of the value added produced by the informal sector will enable us to make a correction to the current estimates of the GNP of North Cyprus. In addition, an estimate will be made of the losses of tax revenues and social security contributions due to the informal nature of these workers and their activities.

III. The Measurement of the Informal Labour Force in North Cyprus

According to the economics literature, there are two ways of measuring the size of informal sector (Thomas, 1992; Yilmaz 1996; Altug 1999):

1) By measuring the market value of the goods and services produced and sold by this sector and,
2) By determining the number of people working in this sector.

Since the national accounts of North Cyprus do not attempt to isolate the values of the informal components of each sector, this study will estimate the quantity of labour employed and from this estimate will derive its contribution to GDP. Among the factors of

production: land, labour, and capital, the easiest one to estimate is the number of the people employed in this sector. It is also the informal nature of the labour market that makes up the essence of the informal sector in North Cyprus.

The size of the informal sector will be estimated by:
1. Computing the number of people employed informally, then;
2. By using the factor income approach estimate the payments made to this labour, then;
3. Estimate the value added of capital to derive to the total contribution of the informal sector to net national product.

The approach taken in this study is to estimate the size of the informal sector for the North Cyprus during the period 1996 to 2000. This study has been made possible due to three rich sets of data for this period that address different aspects of this issue. These data sets are the population census of 1996, the household income and consumption survey of 1998 and the records of the immigration department up to the year 2000. Information is available for the different components of the population of North Cyprus to estimate the size of the informal labour market through the use of the national census. It can also be estimated by constructing an "inventory" of unregistered immigrant workers through the records of the immigration department.

III.1. Population Approach

In this approach, the population of the North Cyprus is broken down into its components to estimate the total labour force. Comparing these findings with the registered employment will allow us to find the unregistered employment. By distributing this informal employment across the sectors according to the results of a survey by Employment office (2002) will allow us to estimate, the GDP they create.

The survey of the State Planning Organisation on the *Census of Population (CP), Social and Economic Characteristics of Population (1999)*, provides a full picture of the population with classification by age groups, gender, education, economic activity, and type of employment. Although the purpose of this survey was not to measure the size of

the labour force, the information gathered provides us with sufficient information on both its formal and informal components.

On 15 December 1996 Sunday, a curfew was imposed and a complete Census of Population (CP) was conducted, with the aim of determining the total population, within the boundaries of the country on the day of enumeration including citizens and foreign national present. Individuals were counted if they were physically present on the census day (*de-facto*). Information was also gathered on the members of the households who were temporarily abroad on the census day, but members of the Turkish Peace Force and the United Nations peacekeeping forces were excluded.

Analysis of the Population

According to CP (1999), the *de facto* population of the North Cyprus in 1996 was 200,587 of whom 164,460 (82%) were Turkish Cypriots, 31,977 (16%) were Turkish and 4,150 (2%) were from third countries. With regard to the age distribution, 22.1 per cent were between the ages of 0-14, 54.6 per cent were between 15 and 44, 16.4 per cent were between 45-64 and 6.9 per cent were 65 and older. Of the population, 52.8 per cent were male and 47.2 were female.

According to the Labour Law (92/22) every person fifteen years of age and older has the right to work. As it is shown in table 1 below, 156,317 people are in the working-age of the remaining there are 44,270, then fifteen or institutionalised in jail or hospital. Furthermore, there are 78,842 who are economically inactive and not in the labour force. These include the retirees, housewives, students, and others. Thus, the remaining 77,475 of the working age population make up the total labour force. According to the census 9,137 people are unemployed or seeking a job, and the rest, 68,338, are employed or in some way economically active.

Table 1 Estimation of Labour Force from Census of Population

Composition of Population		Number of people
1. **TOTAL POPULATION*** ………………………….		**200,587**
a. Age Group 0-14………………………………		44,270
a.1 ages 0-11………………………………..	34,538	
a.2 ages 12-14……………………………….	9,732	
2. **AGE GROUP (15+)** ………………………………...		**156,317**
a. Economically inactive** ……………………..		78,842
a1. Economically inactive (12+)…………..	88,059	
a2. Economically inactive (12-14)…………	-9,217	
3. **LABOUR FORCE*** ** ………………………………..		**77,475**
a. Employed………………………………..		68,338
b. Unemployed………………………………..		9,137

Source: North Cyprus State Planning Organization, Census of Population (1999)
Key**: *Population**: Estimated by the Census of Population on December 1996.
　　　****Economically Inactive**: Includes the retired, housewives, students, on those who did not
　　　　work or obtain an income in kind or cash during the week prior to the census.
　　　*****Labour Force**: Economically active population includes those who worked at least one
　　　　day during the week prior to the census with the purpose of obtaining an income in
　　　　kind or in cash. It also includes those who were not working but had a job and those
　　　　who did not have a job but were seeking one.

Estimation of the Informal Employment

The analysis of the census shows that there are 77,475 people who are economically active members of the labour force in the economy in 1996 (Table 1, row 3). The *de-facto* census of population included all the people living on the Island that particular date. This also means that, the economically active people are not only Turkish Cypriots but also Turkish citizens as well as others.

There are two institutions with which the labour force is registered for employment. Most of the workforce in the public sector is registered with a fund called the Retired Fund (RF) and those temporarily employed are registered with the Social Security Fund (SSF). On the other hand, all the private sector labour force is registered with the SSF. By using the published reports of these two funds, one can calculate the number of people who are formally employed.

In table 2 below, the formally employed people are separated from the total labour force, yielding an estimate of the number people working informally. In total we find that 27,096 people are working without meeting the registration regulations of the government. This represents 34.9 per cent of the total economically active labour force. The ratio of the

Table 2 Informal Labour Force Estimated from 1996 Census

Components of Labour Force	Registered Workers	Total and Informal
1. Labour Force………………………………………..		**77,475**
2. Registered Employees……………………………...		**41,242**
a. Total public employees registered to the public retirement…..	**10,883**	
Consisting of:		
a1. Civil Servants (Retired Fund)……………………………	9,000	
a2. Municipality employees (Retired Fund)…………………..	259	
a3. Public Economic Enterprises (PEE) (Retired Fund)………	1,624	
b. Employees Registered To The Social Security Fund………	**30,359**	
(Includes self-employed, private sector, public sector, PEE and		
Municipalities)		
3. Unemployed (15+)……………………………………….		**9,137**
4. Informal (Unregistered) Labour Force………………....		**27,096**

Sources: 1. Retired Fund Statistics (1997)
2. SSF Activity Report (1997)
3. Census of Population (1999)

informal labour force (L^{IF}), table 2, row 4, to the formal registered other labour force (L^{F}), row 2, is equal to 0.66.

III.2. Migration Approach

The migrants from Turkey are now a reality and they are part of the economy in North Cyprus. We define the informal labour market as the number of migrants who are working in the economy of North Cyprus without a work permit. Although there are few legal restrictions for people who wish to enter North Cyprus, its borders are very effectively controlled. In particular, its border with South Cyprus is highly controlled. Its two seaports and one airport have a very effective interconnected computerized information system that records the movements of people entering and exiting North Cyprus.

Estimation of Migrants Working Informally in North Cyprus

According to the reports of Immigration Office within the Ministry of Internal Affairs (Immigration Office, 2002), since 1974 up to the end of year 2000, the number of foreigners who entered the country that had not yet left were 49,848. This is the difference

between the entrances and exits excluding tourists and those who have extended their visa to stay (Table 3 below).

The statistics from the SPO (2002) reports that in 2000 there were 15,472 students registered to the universities, from which 13,595 are from Turkey and rest 1,877 are from third countries. At the same time the Employment Office has provided information for the year 2000 which reports that there were 8,406 working permits given to migrants during that year. Annual permits numbered 5,906 and 2,500 were given for seasonal jobs such as citrus picking and tree planting.

The report prepared by the Employment Office (2002) for a sample of 400 migrants, also indicated that some workers are here with their families, including their children. The children, in particular, can not be counted us being economically active. The same study reports that approximately 20 percent of the all these surveyed had an economically inactive family member with him. If these reports are applied to the total migrant population, the number of wives and children in the migrant population are estimated to be 5,193 in total. By taking into consideration the foreigners who are legally working, and also those who are not in the labour force, the estimated number of migrants who were in the economy in 2000 and were illegally employed amount to about 20,775 individuals.

Table 3 Estimation of Migrants Working in North Cyprus

Types of Migrants	Inflows	Total and Informal
1. Inflow-Outflow Differences[a]……………….		49,846
2. Foreign Students in Universities[b]………....	15,472	
From Turkey……………………………..	13,595	
From 3rd countries……………………….	1,877	
3. Migrants with Work Permits[c]…………….	8,406	
Long-Term (yearly)……………………...	5,906	
Seasonal (Citrus and Plantation)………...	2,500	
4. Economically Inactive Migrants[d]………...	5,193	
5. Informal (Illegal) Working Migrants[e]……		20,775

Sources: a. Immigration Office Report (2002)
          b. SPO (2002)
          c. Employment Office Report (2001)
          d. Employment Office Report (2002) and authors' estimation
          e. Row 5=Row 1- Row 2- Row 3-Row 4

To estimate the total informal employment in North Cyprus, we need to estimate the number of local residents, who are employed but are without registration as well.

Estimation of Citizens Working Informally

In order to work formally residents need to be registered to either the RF or the SSF. As mentioned earlier, people working in the public sector on a permanent basis are registered with the RF and people employed in the private sector are registered to the SSF. Since we would not expect any employment by the state without registration, for the RF, attention will be focused on the private sector, where recruitment without registering to the SSF is expected.

According to the officials working in the Social Security Office (SSO), because of the generosity of the SSF benefits given to participants, Turkish Cypriot citizens would not choose to work for a long period of time without joining the social security system. From their observations, it is mainly the young people who choose to work as unregistered employees for short periods of time. According to information obtained by the Social Security Office from their inspections of firms, the numbers of citizens working informally are estimated to be between 5,000 and 6,000 in year 2000.

The study at this point will accept the lower level observation of the SSO and use 5,000 as an estimate of the citizens working informally. This represents 6.5 per cent of the labour force.

Total Informal Employment in 2000

Summation of the estimated number of migrants working informally with the number of the citizens working informally, the total number of informal employees in 2000 totalled 25,775, Table 4, row 3.

The number of informal workers working without documentation in 2000 represented 33.2 percent of the total labour force or 37.7 percent of the number of people (employed). Hence, in 2000 the ratio of the size of the informal labour to formal labour force (L^{IF}/L^F) is estimated to be equal to 0.63. When comparing this estimate of the informal labour force

with the estimate of 0.66 using the 1996 census data, we find that these two estimates are very close to each other.

Table 4 Total Informal Employment (2000)

Domestic and Migrant Components	Number of Workers
Illegally Working Migrants…………………………………...	20,775
Citizens Working Informally……………………………….	5,000
Total Informal Employment……………………………...	**25,775**

IV. Value Added Created by the Informal Sector in North Cyprus

It is important to calculate the amount of value added that the informal sector creates and the amount of this value added that is not included in the national income statistics. In order to be able to do this calculation, there is a need to make certain adjustments with regard to the components of informal sector beyond the value added of the informal labour force as measured above.

IV. 1 Population Approach (1996)

In order to be bale to calculate the whole income created by the informal sector, in addition to the informal employment estimated, there is another component of the informal sector which includes the income created by people who have an informal job in addition to their regular formal sector job[2]. According to the Household Income Survey of the SPO, the income generated by these additional informal jobs was 1,867,024 million TL in 1998 which is only 1.65 per cent of the disposable income and 0.7 per cent of the GNP in 1998. This ratio to GNP is used to estimate the compensation of these informal additional jobs in 1996. The value added of these additional informal sector jobs is estimated to be 507,999.9 million TL in 1996.

From the same household income survey, unpaid family workers, who are employed in family businesses without receiving a wage or salary, generated 101,556 million TL, which is 0.089 per cent of disposable income, and 0.043 per cent of GNP in 1998. The nominal value of this component in 1996 is estimated to be equals 57,186.6 million TL. Combining these two values we have a total of 565,186.6 million TL in 1996, for the

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[2] Incomes from additional jobs are usually not being reported to the tax administration and are not included in the National Accounts.

amount of income earned by the moonlighting of formal sector employees, plus the value of labour provided by unpaid family workers are reported in table 5, row 2.

Table 5 Total Compensation to Informal Employment in 1996

	Source of informal Components	Value in million TL
1	Compensation of Informal Employment (yearly)………….	4,812,249.6
2	Compensation of Additional Jobs plus	
	Unpaid Family Workers…………………………………	565,186.6
3	Total Compensation to Informal Employment……………..	5,377,436.2

Source: Row 1 is equal to the number of informal workers (27,096) times the minimum wage in 1996 (14.8 million TL/month) times 12.

According to the survey carried out by the Employment Office (EO) (2002)[3] of employees not registered with the office, the distribution of the informal employment across industries is as follows:

Table 6 Distribution of Informal Employment by Sectors

Sectors	% of Informal Employment
1 Agriculture……………………………………	3.5
2 Industry…………………………………….	15.7
3 Construction………………………………...	43.5
4 Trade, Hotels, Restaurant……………………..	30.6
5 Transportation…………………………………	2.8
6 Financial Institutions………………………….	0.8
7 Business and Personal Services………………	3.1
8 Total	**100**

Source: Employment office, North Cyprus (2002)

The findings shown in table 6 indicate that most of the informal sector employment is concentrated in sectors which create the largest proportions of value added in the economy, such as tourism, and construction. These are the sectors where labour is needed. Thus, they have been motivated to search for jobs in these kinds of sectors.

The study by Mehmet and Tahiroglu (2000), surveyed 513 informal sector workers and found that most of the informal sector workers are common labourers, and largely unskilled. They are ready to work for the minimum wage with poor working conditions.

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[3] Employment Office made a survey on 400 informal employees and determined these shares.

They have estimated that 55.9 per cent are in the service sector, 16.2 per cent are in the production and transportation, 27.1 per cent are construction labourers and the rest are clerical and sales personnel. The findings of the two studies support each other and provide sufficient data on the sectoral distribution of informal employment.

The link between the formal and informal sector needs to be analyzed carefully. There is no definite distinction between the formal and the informal sectors. It is well known, however, that the informal sector often provides services to the formal sector. For example, the sub-contracting out of tasks by companies enables them to employ inexpensive non-unionised labour and offers greater flexibility for the company. This may mean that the some of the employment used for the production of any good is informal but the output has been recorded in the official statistics of income. A very good example of this is the case of the construction sector in North Cyprus. It is well known that most of the labour in the construction sector in North Cyprus is informal. Usually various components of a construction project are sub-contracted out by the construction companies to informal groups of employees to complete. These employees are not registered with the tax office or the social security fund. However, everyone who constructs a building needs to get a "construction permit" from the local municipality to be able to use the building as a home or any other purpose. This means that whatever has been constructed is duly registered, otherwise they cannot get electricity and or other public services without it having a valid building permit. Only the repairs and renovations, such as painting, redecoration and other minor works do not need building permits.

When measuring the value added created by the construction sector the SPO, gets the statistics from the municipalities and other institutions that have provided permits for construction and then calculates how many square meters of construction have been built. So the official statistics of income for the construction sector will actually include most of the value added that has been created by the informal employment. From a fiscal point of view, these informal employees do not pay any income tax on the income they generate. As they are not registered with the SSF, they will not contribute to it either. Thus, what is seen and accepted as informal in some sectors is actually recorded in the national income and production statistics, but is not included in the taxable income of the country. On the tax side, their evasion is also only partial as they will pay the value added tax, and excise taxes (funds), in the same way as any other consumer. In overall magnitude, these taxes

are a bigger share to the public sector revenues than are the personal income tax and social security contributions.

In countries where the per capita income is between $5,000 and $10,000, the share of national income accruing to labour is approximately 50 percent. In other words, the value added of labour, measured as salaries and wages, is approximately equal to the net value added of capital. This is reflected, in the case of North Cyprus, where the proportion of the formal labour compensation is measured to be 27,337,600 million TL, which is 0.43 per cent of the measured GNP in 1996 (SPO, 2000). Using this information we want to derive what is likely to be the value added of capital that is unrecorded along with labour in the informal sector.

Let us begin by defining,

V_L = Total value added of labour
V_K = Total value added of capital
V_L^F = Value added of formal labour force
V_L^{IF} = Value added of informal labour force
V_K^F = Value added of capital in formal sector
V_K^{IF} = Value added of capital in informal sector
L^F = Number of members in the labour force of the formal sector
L^{IF} = Number of members in the labour force of the informal sector

The numbers of people working in the formal and informal segments of the labour market of the North Cyprus in 1996 are estimated as reported in table 2. Hence the ratio of the informal labour force to the formal labour force is given by,

(1) $\quad \dfrac{L^{IF}}{L^F} = 0.66$

We will denote I as the relative capital intensity of the informal sector. This is measured as the ratio of the value added of capital per worker in the informal sector to that in the formal sector. The definition of I is shown in equation 2.

(2) $\quad \dfrac{\dfrac{V_K^{IF}}{L^{IF}}}{\dfrac{V_K^F}{L^F}} = I$

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If we denote the ratio of $\dfrac{L^{IF}}{L^F}$ as U, then we have,

(3) $\qquad V_K^F = V_K^{IF} \dfrac{1}{(U)*(I)}$

The value added of labour per worker in the informal employment is less than that of formal employment as the wages and salaries in the informal sector are not as high as in the formal labour force. Most of the labour in the informal sector works for the official minimum wage.

We denote the relative wage rate paid in the informal sector as M. It is defined by equation 4 as,

(4) $\qquad \dfrac{\dfrac{V_L^{IF}}{L^{IF}}}{\dfrac{V_L^F}{L^F}} = M$

In a similar fashion to equation 3, we have,

(5) $\qquad V_L^F = V_L^{IF} \dfrac{1}{(U)*(M)}$

As mentioned above, from the SPO (2002), we know that the ratio of the measured value added of labour (formal sector value added) to measured GNP is 0.43, and can be expressed as,

(6) $\qquad \dfrac{V_L^F}{GNP} = 0.43$

We also know from the national accounts SPO (2001) the ratio of NNP/GNP = 0.908. Hence, we have,

(7) $\qquad \dfrac{V_L^F}{NNP} = 0.48$

Expressing equation (7) in terms of the measured value added, we have

(8) $\qquad \dfrac{V_L^F + R(V_L^{IF})}{V_K^F + V_L^F + (R)(V_K^{IF} + V_L^{IF})} = 0.48$

where R denotes the proportion of total value added of the informal sector capital plus labour $(V_L^{IF} + V_K^{IF})$ that is already reported in the measured GNP of North Cyprus. Substituting equations 3 and 5 into equation (8) we find that V_K^{IF} can be expressed as a function of V_L^{IF} as follows,

$$(9) \qquad V_K^{IF} = V_L^{IF} \frac{\left[0.52 * \dfrac{1}{U} * \dfrac{1}{M} + 0.52R \right]}{\left[0.48 * \dfrac{1}{U} * \dfrac{1}{I} + 0.48R \right]}$$

Now, we wish to solve for the share of the value added of labour to the total of the value added of labour plus capital in the informal sector. We denote this share as S_L^{IF}. It is defined as,

$$(10) \qquad S_L^{IF} = \frac{V_L^{IF}}{V_L^{IF} + V_K^{IF}}$$

Substituting equation 9 into equation 10, we are now able to solve for S_L^{IF} in terms of M, I, U and R. The expression for S_L^{IF} is given by equation 11 as,

$$(11) \qquad S_L^{IF} = \frac{\left[0.48 * \dfrac{1}{U} * \dfrac{1}{I} + 0.48R \right]}{\left[0.48 * \dfrac{1}{U} * \dfrac{1}{I} + 0.52 * \dfrac{1}{U} * \dfrac{1}{M} + R \right]}$$

To empirically estimate (11) we need to know the value of U, I, M and R. U is given to us by the relative sizes of the informal labour market to the formal labour market as $U = 0.66$. In the North Cyprus it appears that those sectors and parts of sectors where large number of informal workers are employed are somewhat less capital intensive than their formal counterparts. Hence, in the base case estimates, I is set equal to 2/3. If the informal (unregistered) workers were spread eventually throughout the sectors in the economy, then the quantity of capital employed per worker would be approximately the same for both registered (formal) and unregistered (informal) workers. In this case I would have a value of one. In the base case the average real wage in the informal sector is assumed to be only 2/3 of the real wage in the formal sector i.e. $M = 2/3$. The relative magnitude of this variable is supported by evidence from various labour surveys, which have shown that the informal sector workers are less skilled than the average of the labour force and earn a lower wage (Mehmet and Tahiroglu, 2000).

The estimated value of R is based on the allocation of the informal sector workers as shown in table 5. It is estimated that 43% of the informal sector employment is based located in construction activities. The value of new construction, which is about 2/3 of the total, is already reported in the GNP estimates. Very little of the other construction activities or the output of the other informal sectors activities are reflected in the national accounts. Hence, from these calculations we use a value of R = 0.25.

Setting U = 0.66, M = 2/3, I = 2/3 and R = 0.25 and solving equation 11, we find that,

$$S_L^{IF} = 0.48$$

If the value for M is net equal to I, the share of the relative value added of labour in the informal sector becomes the same as in the formal (registered) sector.

Table 7: Estimation of the Share of the Value Added of Labour in the Informal Sector (S_L^{IF})

	Cases	U	I	M	R	S_L^{IF}
A.	Base Case…………………………….	0.65	2/3	2/3	0.25	0.48
B.	Lower relative wage rate equal to half of formal sector………………………	0.65	2/3	1/2	0.25	0.42
C.	Value added of capital per worker same as formal sector………………………	0.65	1.00	2/3	0.25	0.39
D.	Value added of capital per worker same as formal sector and wage rate equal to half of formal sector………...	0.65	1.00	1/2	0.25	0.33

In case B, we set I equal to 2/3 while setting M = 1/2, U = 0.66 and R = 0.25. In this case the result is that S_L^{IF} becomes 0.42. In case C, when I is set equal to one, while leaving M = 2/3, U = 2/3 and R = 0.25, we find S_L^{IF} is equal to 0.39. Finally, in case D, when I is set equal to one, while leaving M = 1/2, U = 0.66 and R = 0.25, we find the value of S_L^{IF} is equal to 0.33.

Given that the value added of labour in the informal sector is the wage rate earned in the informal sector (W^{IF}) times the quantity of people employed in the informal sector we have,

(12) $V_L^{IF} = W^{IF} L^{IF}$

Also from the definition of net national accounts, we have,

(13) $NNP^{IF} = V_L^{IF} + V_K^{IF}$

Substituting equations (12) and (13) into equation (10), we find NNP^{IF} in equation 14 as,

(14) $NNP^{IF} = \dfrac{W^{IF}L_{IF}}{S_L^{IF}}$

Given that the rate of NNP/GNP in the North Cyprus is equal to 0.908 and assuming that this relationship also holds for the informal sector, one can derive the value of GNP^{IF} for the informal sector as in equation 15,

(15) $GNP^{IF} = \dfrac{W^{IF}L^{IF}}{S_L^{IF}(0.908)}$

Furthermore, as the proportion R of GNP^{IF} is already recorded in the national account, thus the proportion of the unrecorded GNP_{un}^{IF} is equal to $(1 - R)(GNP^{IF})$.

Using equation (15) and applying this proportion, we have the expression for the unrecorded value of the informal sector, GNP_{un}^{IF},

(16) $GNP_{un}^{IF} = (1 - R)\dfrac{W^{IF}L^{IF}}{S_L^{IF}(0.908)}$

From our estimate of the number of people in the informal labour force L^{IF}, and assuming they were each earning the minimum wage of W_L = 14.8 million TL monthly or 177.6 million per year in 1996 prices, we see in Table 5 that the value added of labour in the informal sector $V_L^{IF} = W^{IF}L^{IF}$ = 5,377,436.2 million TL in 1996. Using our estimate of S_L^{IF} for the four cases reported in Table 7 and this estimate of the value added of labour in the informal sector, we are able to measure GNP_{un}^{IF} as reported in column 2 of Table 8.

The value of the measured GNP in 1996 was 63,567,940.3 million TL (SPO, 2002). This includes the both formal sector plus the recorded part of the informal sector. Using this value of measured GNP plus the values of GNP_{un}^{IF} for the four cases we can estimate the shares of GNP that is not recorded due to the existing of the informal sector. This is shown in column 3 of
table 8.

Cases	S_L^{IF}	GNP_{un}^{IF} (m TL)	$\dfrac{GNP_{un}^{IF}}{(GNP_{un}^{IF} + GNP)}$
	(1)	(2)	(3)
A. Base Case…………….…………	0.48	9,253,572.76	0.13
B. Lower relative wage rate equal to half o formal sector……………...	0.42	10,697,130.11	0.14
C. Value added of capital per worker same as formal sector…………….	0.39	11,315,797.54	0.15
D. Value added of capital per worker same as formal sector and wage rate equal to half of formal sector...	0.33	13,378,022.33	0.17

These estimates indicates that the size of the informal sector of North Cyprus in 1996 ranges from 13 to 17 percent of the total GNP. From the National Income Accounting point of view, this is the correction factor that should be made to the national income statistics.

IV.2 Migration Approach (2000)

The same assumptions are made in the estimation of the value added created by the informal employment, except that the estimates of the size informal employees are lower.

Table 9 Total Income Created by Informal Employment in 2000

	Source of Informal Compensation	Value (Million TL)
1	Compensation of Informal Employment (yearly)……………...	45,931,050.0
2	Compensation of Additional Jobs and Unpaid Family Workers………………………………………..	4,839,753.8
3	Total Comp. to Informal Emp. $(W^{IF}L^{IF})$…………………………	50,770,803.8
4	Value of measured GNP in 2000……………………………….	651,380,055

Source: Row 1 is equal to the number of informal workers (25,775) times

the minimum wage in 2000 (148.5 mil TL/ month) times 12

It is assumed again that the employees in the informal sector on average are all paid the minimum wage (148.5 million TL/month), and to this value, the income generated by the

additional part-time job holders and unpaid family workers is added. Thus the labour's value added is as shown in Table 9 above.

We again carry out estimates of the share of the value added of labour in the informal sector for the same four cases as shown in table 7. These results are reported in column 2 of Table 10.

Using the values of $W^{IF}L^{IF}$ and the size of the measured GNP for 2000 as reported in Table 9, we are now able to estimate the size of the unreported informal sector and its share of total GNP in North Cyprus in year 2000. These values are shown in column 2 and 3 of table 10 below.

Table 10 Size and Shares of Unrecorded Informal Sector in North Cyprus in 2000

Cases	$S_L{}^{IF}$	$GNP_{un}{}^{IF}$ (m TL)	$\dfrac{GNP_{un}^{IF}}{(GNP_{un}^{IF} + GNP)}$
	(1)	(2)	(3)
A. Base Case………………………………….	0.48	87,367,159.62	0.12
B. Lower relative wage rate equal to half of formal sector……………………………….	0.42	101,134,105.99	0.13
C. Value added of capital per worker same as formal sector…………..........................	0.39	107,119,734.84	0.14
D. Value added of capital per worker same as formal sector and wage rate equal to half of formal sector……………………………….	0.33	126,872,310.06	0.16

These estimates indicates that the size of the informal sector of North Cyprus in 2000 ranges from 12 to 16 per cent of the total GNP.

In summary using these two appropriates to the estimation of the size of the informal sector gives us remarkably similar estimates. Combining the results we find that the shares of the unrecorded informal sector in the North Cyprus range from 12 to 17 per cent of the total GNP of the economy. These values are quite similar to those found for the ratio of the estimated size of the informal sector to GDP for the OECD countries. This result is initially surprising given the much larger size of the workforce that is informal in North Cyprus. However, in North Cyprus a much larger proportion of the activities of the

informal labour force are captured by the national income statistics than is the case for the OECD countries.

V. Tax Revenue and Social Security Losses Caused by Informal Sector

Apart from the correction on the National Income accounting, the informal sector causes a loss in tax revenues and social security contributions. These are follows:

1) Tax losses on the unrecorded informal value added of capital

Since the study assumed that informal sector employees work for minimum wages and there is no income tax for the minimum wage in North Cyprus, the tax losses is only caused by the evasion of the taxes on the net income from capital. The marginal effective tax rate on income from capital in North Cyprus is 36.25 per cent[4].

$$\text{Tax Losses} = (NNP^{IF} - V_L^{IF}) * t = (.908 * GNP_{un}^{IF} - W^{IF}L^{IF}) * t$$

Where t = 36.25%

2) Social Security Contribution Losses;

The employee contributes is 8 per cent and the employer is 10 per cent to the social security fund. Again additional jobholders and unpaid family workers are not included as they are assumed to be below the taxable threshold[5].

3) People registered to the SSF also must contribute to the Provident Fund (PF). The contribution rate is 5 percent from the employee and 5 per cent from the employer[6].

The tax and social security contribution losses are calculated for our base case estimates of the unrecorded GNP^{IF} for 1996 and 2000. These are reported in table 11 below. The findings of the fiscal calculations show more clearly the significant tax and social security losses. The total tax losses are calculated to be as much as the 9.4 per cent of the total tax revenues of the North Cyprus in 1996. At the same time the funds not contributed to the SSF is as large as the 37.7 per cent of the total revenues of the SSF in 1996. The tax losses are equivalent to 7.9 per cent of the total tax revenues in 2000. These findings indicate that

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[4] Ministry of Finance (2001)
[5] SSO (2001)
[6] SSO (2002)

the informal sector leads to a significant amount of tax and social security revenue losses in North Cyprus.

Table 11 Total Tax and Social Security Losses Caused by Informal Sector

	Items	1996 Revenue Loss (Million TL)		2000 Revenue Loss (Million TL)	
1	Tax Losses on the unrecorded informal value added of capital, t = 36.25%...	1,096,492		10,352,484	
2	Social Security………………………….	866,205		8,267,589	
	a. Employees' Contribution (8%)…….		384,980		3,674,484
	b. Employers' Contribution (10%)……		481,225		4,593,105
3	Provident Fund………………………….	481,225		4,593,105	
	a. Employees' share (5%)……...........		240,613		2,296,553
	b. Employers' share (5%)…………….		240,613		2,296,553
	Total Tax And Social Security Losses……………………………..	**2,443,952**		**23,213,178**	

Key: t = (25% corp. tax + 15 tax undistributed profit) = 36.25%

VI. Conclusion

The analysis made for the labour market in North Cyprus has shown that informal sector is a large proportion of labour market in North Cyprus. The findings using two approaches to the estimation indicate that informal employment is between 35 to 40 percent of the total labour force. Most of the informal labour force is made up of temporary migrants from Turkey. It also found that not all the output made by the informal labour force is now excluded from the official income statistics. A large proportion of the output that is informally produced is actually included in the measured GNP of North Cyprus.

The value added of the informal sector expressed as a percentage of total GNP (official plus informal value added) has been found to be between 13 to 17 percent in 1996. For this year the informal labour force is estimated using the 1996 Census data. Using the cumulative migration data, the informal labour force is estimated for 2000 and the size of the output of the informal sector ranges between 12 to 16 percent of GNP for year 2000. In addition to the national income statistics correction, there is an estimation of fiscal losses. The treasury loses as much as 9 percent of its potential tax revenues, as result of the tax evasion caused by the informal sector. Moreover having nearly 40 percent of the labour force not registered to the social security system results is a loss of 37 percent of the total potential contributions to the social security fund.

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