FORMAL AND INFORMAL
CREDIT MARKETS IN EGYPT

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Working Paper 9415

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Abstract

This paper examines empirically the markets for formal and informal credit in Egypt. Using a dataset specifically collected for the purpose, it examines what factors determine whether or not a person borrows from the informal sector using a probit analysis. The paper then conducts a similar exercise for the informal financial sector and seeks to examine whether any link between borrwing in the formal and the informal financial sectors exists. Conclusions are then drawn as to the role of informal financial markets in the development process.

ملخص

تدرس هذه الورقة بأسلوب كمى اسواق الأئتمان الرسمية و غير الرسمية فى مصر . وباستخدام مجموعة من البيانات التى تم جمعها خصيصا لهذا الغرض، تبحث الورقة العوامل التى تحدد ما اذا كان الفرد سيتجه للاقتراض من القطاع الرسمى أم من القطاع غير الرسمى باستخدام تحليل للاحتمالات. ثم يتم فى هذه الورقة اجراء دراسة مماثلة عن القطاع المالى غير الرسمى و يتم بحث ما اذا كانت هناك علاقة بين الأقتراض من القطاع المالى الرسمى و القطاع المالى غير الرسمى. و تنتهى الورقة بعرض دور الأسواق المالية غير الرسمية فى عملية التنمية.

1. Introduction

Although there is a wide recognition of the importance of informal financial markets (IFMs) in developing economies, their role in the development process[3] is the subject of controversy. One school of thought contends that IFMs are fragmented and dominated by usurious money lenders who exploit their market power. IFMs therefore play a negative role in economic development and should be absorbed into the formal sector during the financial development process. In the meantime, government policy should aim to restrict the activities of IFMs[4]. The opposing view claims that IFMs maintain very low transaction costs because of their comparative advantage in information acquisition and lower administrative costs. They are thus both competitive and agile[5] and improve the allocative efficiency of the loanable funds market. This informational advantage may also enable the informal sector to extend credit to those who have fallen outside the remit of the formal financial sector. This school of thought would therefore suggest that informal financial markets should be protected from arduous government intervention and regulation[6].

It is argued that these disparate conclusions derive in part from a disagreement about what is meant by IFMs. This confusion arises firstly because informal financial transactions, by their very nature, occur outside the domain of the legal system. Thus little reliable and systematic evidence is available for detailed scrutiny. Secondly, the activities of the informal sector are often defined in a residual manner, namely 'all activity that lies beyond the pale of official regulation or control is considered to be informal in nature'[7]. Treating informal financial activity as a residual is partly responsible for the lack of in depth analysis in the financial development literature. Thirdly, the understanding of the operation of IFMs is influenced by a limited number

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[3] For a review of the arguments of the neo-liberals and neo-structuralists regarding the activities of IFMs, see Fry (1988).
[4] This is clearly realised in the works of Goldsmith (1969), Shaw (1973) and Mckinnon (1973).
[5] See Taylor (1983) p. 92.
[6] For further details of this view see, for example, Pischke, Adams and Donalds (1983).
[7] Montiel, Agénor and Haque (1993), p 8.

of empirical studies on informal finance that are dominated by research in the Indian sub-continent. The generalisation of these findings to economies characterised by different economic and cultural environments gives an inaccurate view of the role of IFMs. Finally, labelling the informal financial sector by epithets such as 'black', 'underground' and 'hidden' has resulted in this sector being subject to ideological debate. This has made it difficult to analyse the structure and role of IFMs impartially[8].

The aim of this paper is to remedy some of these shortcomings. It seeks to quantify both the size and the role of the informal financial sector and provide a more objective view of the role that IFMs play in the process of economic development. The country which has been chosen for this analysis is Egypt, since this provides both an economic and a cultural contrast to the other countries in which IFMs have been studied. Section 2 begins by discussing the sampling frame that is used in this study in more detail, with section 3 presenting the basic findings regarding the relative sizes, in terms of activity, of the formal and informal financial markets. Section 4 then conducts a probit analysis to determine which factors affect whether or not a given individual will have a formal loan, with section 5 performing a similar exercise for the informal sector. Section 6 then compares the results obtained from the two sectors. As a corollary to this, section 7 then presents the results of a bivariate probit analysis which seeks to ascertain if any simple correlation exists between decisions taken in the formal sector and decisions taken in the informal sector. Finally, section 8 concludes by summarising what has been learnt about the role of IFMs in Egypt.

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[8] Montiel, Agenor and Haque (1993) pp 8-9.

2. The Data

The data which is used in this paper is a sample of 200 households from four Egyptian Villages collected between mid-December 1992 and mid-April 1993[9]. The villages are situated in the district of Kafr Shukr, which is part of the Kalyoubbiya Governorate. This is a rural province of 1001 km² in the Nile delta, 60 Kilometres north east of Cairo. The Kalyoubbiya Governorate's population was approximately 2.9 million in 1992[10], a population density of 2513 persons/Km². This is the fifth highest density for a Governorate in Egypt.

Approximately 43 percent of Kalyoubbiya's population live in urban areas. Of the Governorate's urban population, some 66 percent live in the southern industrial area, close to Cairo, where some firms were first established in the second and third decades of this century. In the 1960s, during a period of heavy industrialisation, this area became one of the main industrial locations in Egypt. The remainder of the urban population lives in the Governorate's capital, Benha, and some other under-developed cities. Kalyoubbiya, like her neighbouring Governorates in the fertile delta[11], is characterised by a high level of farm fragmentation and the prevalence of small land-holding (less than one feddan)[12]. However, closeness to the Cairo market (which serves more than 12 million consumers), has led the agricultural sector of the Governorate to specialise in relatively high earning fruit and vegetables production, as well as poultry farming.

During the last three decades several infrastructure projects were implemented to provide the inhabitants of the Governorate, especially those who live in the urban areas, with tap water, electricity, schooling, health centres and district hospitals and a

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[9] For a full description of the sampling methodology see Mohieldin (1993).
[10] Estimated for 1992 from 1986 Census.
[11] See Commander (1987) p 46 for a description of the main characteristics of three other governorates in the delta.
[12] 1 feddan = 24 qirats = .43 hectares = 1.038 acres.

reasonable network of roads. As a result, in addition to the common categorisation of regions to urban and rural, many parts of Kalyoubbiya can be described as semi-urban or semi-rural depending on the level of urbanisation and type of activities of the population.

Kafr Shukr is an administrative district which was established in 1963. It occupies the North East part of the Governorate and consists of 24 villages, including 'Kafr Shukr', which has been given a city status since 1968. However, given the coexistence of urban and rural features, even Kafr Shukr should be considered semi-urban.

Table (1) Population and Sample Size of the Four Villages

	Shukr	Asneat	Menshat	Shahawy
Population (1986)*	15144	8911	5859	1922
Population (1992)**	17257	11179	6676	2190
Number of Households***	3522	2281	1362	446
Sample Size	80	50	40	30
Sample size / population %	2.27	2.19	2.93	6.72

*   Source: CAPMAS, National Census 1986.

**   Calculated for 1992 with 2.2 net average population growth rate.

*** Household sample size is approximately 4.9 for the Kalyoubbiya Governorate CAPMAS National Census (1986).

Applying a two stage random sampling methodology, the first stage of the sampling procedure involved choosing 4 villages from the sampling frame of 24 villages in the district of Kafr Shukr. The selected villages were 'Al Menshat al Kubra' , 'Asneat', 'Kafr El Shahawy' and 'Kafr Shukr', henceforth Menshat, Asneat, Shahawy and Shukr respectively. Details of the sampling from each village are given in Table 1. The questionnaire was designed to give a complete picture of the households' demographic characteristics, income, assets, living standards, portfolio selection,

preference of savings instruments and details of the households' financial transactions in the formal and the informal financial sectors. In an attempt to obtain high quality and comprehensive data on sensitive issues the number of villages and the size of the sample had to be kept small.

3. Formal and Informal Finance in Rural Egypt

The detailed results of the survey are summarised in Table 2. This shows that 22.5% of households had either deposit or current accounts with the formal banking sector, and 30% had formal sector loans. Only 6% of households had formal loans and deposits simultaneously.

It is interesting to note that a higher proportion of the sample had links with the informal sector. Table 2 shows that 13% of the sample borrowed and lent simultaneously in the informal sector, 27% of the households extended informal credit to others without borrowing themselves, and 29.5% borrowed from others without lending. Thus, in total, 69.5% of households has some relation with the informal financial sector. Taken together, the survey reveals that 86% of the 200 households borrowed or lent in either the formal or the informal financial sectors.

By focusing on the borrowing side, we find that the relative size of informal credit obtained by the households was small, amounting to 30.6% of total credit. Even after allowing for the fact that a single client received 34% of formal credit, it is still the case that informal loans tend to be smaller than formal loans. Informal credit is approximately 40.0% of total credit [13].

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[13] Note that this figure excludes tied credit and RoSCA funds.

Table 2 Formal and Informal Transactions

	Formal Sector		Informal Sector	
	Borrowed	Didn't Borrow	Borrowed	Didn't Borrow
Lent	6	16.5	13	27
Didn't Lend	24	53.5	29.5	30.5

Note: Percentage of households in each cell; n=200.   Source: Survey data.

4. A Probit Analysis of the Formal Sector

Whilst a wide variety of questions were asked of each household, the subset which will be the focus of the econometric analysis in the paper is given in the Appendix. This subset of the full dataset was chosen so as to give a comprehensive description both of the individuals who were borrowing funds (e.g. age, sex, educational level, occupation, marital status) and the households of which they were a member (household size, type of dwelling, ownership of dwelling). In addition, a wide variety of variables reflecting the financial position of the individual were included (level of income, level of savings, main source of income, total assets, ownership of land, ownership of gold). Finally, all respondents were asked if they had any strong reasons for not dealing with the formal financial sector. These subjective responses were included as regressors in an attempt to capture cultural and attitudinal variants which are not captured by the other variables. Thus, for example, 'religion' is a dummy variable which indicates that the individuals has strong religious objections to dealing with the formal financial sector.

The parsimonious results of the probit estimation for the formal sector are given in Table 3 column 1. Only variables which achieved a least a 90% level of significance

were not excluded- the t-ratios for each variable are given in parentheses. Column two also lists the marginal effects for each of the variables and their t-ratios.

The probit model of the formal sector is extremely well determined, with a pseudo R^2 of 0.96[14]. However, the LM statistic indicates that the null of no heteroskedasticity should be rejected, and so the parameter estimates and standard errors should be viewed with some caution.

Financial variables prove to be an important determinant of whether or not an individual borrows from the sector. This may be explained by the fact that, in the formal sector, the financial institutions are primarily concerned with the ability of the individual to repay both the principal as well as the interest on a loan. Since the level of income is a key determinant of an individual's ability to repay it is perhaps not surprising to find that this variable is significant in the determination of whether or not the individual has a loan. The demand for loans may also be a positive function of the level of income.

The fact that the assets of the individual may be used as collateral for a loan also helps to explain their presence in the formal loans equation. Likewise, in rural Egypt, agricultural land is also used by the banks as a surety. However, the regulations governing the land market mean that the renting of land from others is a valuable asset since the person can offer the productive claim on the land to the bank as collateral. Renting land from others is thus also an important determinant of whether or not the individual has a formal loan.

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[14] the pseudo-R^2 used in the analysis is that of McKelvey and Zavoina (1975).

Table 3: Demand for loans in the formal sector

	coefficient	marginals	coefficient	marginals
constant	-5.16(-2.925)	-0.29(-1.178)	-5.42(-3.058)	-0.29(-1.164)
villages				
Shukr Shahawy	-1.08(-1.943)	-0.61e-1(-1.141)	-1.04(-1.811)	-0.55e-1(-1.099)
Asneat	-1.25(-1.947)	-0.70e-1(-1.126)	-1.12(-1.691)	-0.60(-1.052)
Menshat	-1.03(-1.692)	-0.58e-1(-1.109)	-0.93(-1.273)	-0.44(-0.957)
Individual characteristics				
female	-2.68(-2.148)	-0.15(-1.192)	-2.72(-2.203)	-0.14(-1.165)
below general certificate	1.08(2.057)	0.61e-1(1.111)	1.09(2.038)	0.58e-1(1.096)
married/widowed	-1.64(-1.705)	-0.92e-1(-1.218)	-1.69(-1.789)	-0.90e-1(-1.209)
income/1000	0.50(3.033)	0.28e-1(1.515)	0.52(3.072)	0.28e-1(1.456)
$(\text{income}/1000)^2$	-0.82(-1.802)	-0.46e-3(-1.463)	-0.88e-2(-1.888)	-0.47e-3(-1.418)
own land	1.37(3.603)	0.77e-1(1.116)	1.42(3.580)	0.76e-1(1.097)
rent land from	2.13(3.783)	0.12(1.176)	2.12(3.706)	0.11(1.144)
total assets/1000	-0.17e-1(-3.058)	-0.97e-3(-1.125)	-0.18e-1(-3.087)	-0.97e-3(-1.110)
savings/1000	-0.99(-3.625)	-0.55e-1(-1.378)	-0.95(-3.498)	-0.51e-1(1.327)
loan refused	2.28(2.695)	0.13(1.126)	2.30(2.716)	0.12(1.112)
own gold	0.93(1.471)	0.52e-1(0.967)	1.10(1.655)	0.59e-1(1.000)
Profession				
landlord/agricultural labourer	2.30(2.980)	0.13(1.280)	2.24(2.831)	0.12(1.240)
merchant/trader	3.85(4.119)	0.22(1.248)	3.69(3.824)	0.20(1.205)
government/public sector	2.94(3.945)	0.17(1.265)	2.95(3.874)	0.16(1.233)
farmer	2.27(3.347)	0.13(1.267)	2.18(3.117)	0.12(1.229)
Household characteristics				
household size	1.26(2.705)	0.71e-1(1.158)	1.23(2.610)	0.65e-1(1.127)
household size sq.	-0.87(-2.474)	-0.49e-2(-1.141)	-0.84e-1(-2.367)	-0.45e-2(-1.110)
Reasons for not dealing with the formal sector				
religious	-2.29(-4.175)	-0.13(1.126)	-2.35(-4.091)	-0.12(-1.203)
distance / bureaucracy	1.34(2.377)	0.75e-1(1.190)	1.43(2.476)	0.76e-1(1.176)
treatment	-2.07(-1.841)	-0.12(-1.134)	-2.05(-1.797)	-0.11(-1.110)
bankruptcy	-1.04(-1.644)	-0.73e-1(-1.225)	-1.06(-1.663)	-0.69e-1(-1.194)
cost	-1.29(-2.804)	-0.59(-1.070)	-1.29(-2.778)	-0.60e-1(-1.063)
collateral	-1.04(-2.131)	-0.59e-1(-0.989)	-1.12(-2.246)	-0.57e-1(-0.980)
no need	-3.00(-2.572)	-0.17(-1.201)	-2.98(-2.537)	-0.16(-1.161)
informal loan			0.39(0.975)	0.21e-1(0.775)
R^2	0.96		0.96	
Heteroskedasticity	71.28 **27**		77.85 **28**	

t-ratios in brackets

figures in bold indicate degrees of freedom

Gold has only a marginally significant positive effect on the probability of having a formal loan. This would appear to indicate that it is not used as a form of collateral if the individual needs to borrow. It may be the case that some forms of assets are not recognised by the banks as collateral and are instead liquidated by the individual if they are in need of funds. Thus individuals are less likely to have a loan if they can either run down savings or non-collateral assets.

A somewhat surprising result is that if an individual has been refused a loan in the past then they are more likely to have a loan now. This variable may however be acting as an indicator of potential willingness to participate in the formal sector.

Table 3 also indicates that the profession of the individual is an important determinant of whether or not the individual has a formal loan. Why this should be is not completely clear, though it may be connected with the capital requirements of different jobs. Profession may also be used as an indicator by the banks of ability to repay. It appears that those individuals who have jobs which are either directly or indirectly related to agriculture are more likely to have a loan. Those who fall into the first category include farm labourers and farmers and those that fall into the second include merchants, traders and landlords.

It is interesting to note that a number of personal characteristics show up as determinants of formal loans. For instance, women are less likely to have loans than are men. This may be because it is hard for women to obtain loans for cultural reasons from the formal sector. Indeed, in Egypt, it is usual for a woman to depend on one of her male relatives to manage either land or a project even if she owns it.

Family commitments also appear to be important in determining who obtains loans in the formal financial sector. Those with large families are more likely to have formal sector loans, though this effect diminishes as the size of the family increases. This

may represent a returns to scale effect. Those who are married or widowed (as opposed to being a bachelor or divorced) are also more likely to have a formal loan. This may be indicative of the need to borrow if the individual has a large number of dependants.

Perhaps not surprisingly the subjective reasons for not dealing with the financial sector prove to be statistically significant in determining whether or not the individual has dealings with the formal sector. If the individual has strong religious objections or feels that they lack the necessary collateral then they are less likely to have a formal loan. Individuals also do not borrow from the formal sector if they feel they are treated badly by this sector, feel the sector may become bankrupt, or if they feel that the costs incurred are too high.

Finally, column 3 of Table 3 shows the effect of adding a dummy variable to the parsimonious equation if the individual concerned has a loan in the informal financial sector. Whilst it is recognised that this variable may well be endogenous it can be seen as indicative of some form of interaction between the markets. However, this variable proves to be insignificantly different from zero at the 90% level of significance.

5. A Probit Analysis of the Informal Sector

Another way of examining the relationship between the formal and the informal financial sectors is to look at those factors which determine whether an individual borrows from the informal financial sector, and then compare the results with those obtained in the previous section. The results of the probit analysis for the informal sector are in Table 4 column 1.

As can be seen, the probit model seems to fit the data reasonably well, yielding a pseudo-R^2 of 0.79. However, the LM statistic rejects the null of no

Table 4: Demand for loans in the informal sector

	coefficient	marginals	coefficient	marginals
constant	2.18(3.566)	0.76(3.372)	2.12(3.442)	0.72(3.235)
villages				
Shukr ⎫ Asneat ⎰	0.71(2.208)	0.25(2.180)	0.71(2.203)	0.24(2.173)
Shahawy	1.34(3.434)	0.46(3.432)	1.34(3.429)	0.46(3.422)
Menshat				
Individual characteristics				
income/1000	0.28e-1(0.288)	0.96e-2(0.288)	0.11e-1(0.108)	0.36e-2(0.108)
(income/1000)^2	0.48e-2(2.731)	0.17e-2(2.855)	0.50e-2(2.827)	0.17e-2(3.018)
living standard	-0.25e-1(-2.556)	-0.88e-2(-2.457)	-0.26e-1(-2.620)	-0.90e-2(-2.500)
rent land to	0.86(2.103)	0.29(2.091)	0.85(2.098)	0.29(2.083)
savings/1000	-0.88(-3.559)	-0.31(-4.142)	-0.86(-3.428)	-0.74(-3.816)
main source of income				
wages, public sector	-2.23(-3.820)	-0.30(-2.906)	-2.18(-3.663)	-0.29(-2.734)
wages, private sector ⎫ wages, agriculture ⎰	-0.88(-2.922)	-0.24(-2.758)	-0.84(-2.763)	-0.21(-2.417)
own gold	-0.78(-2.062)	-0.27(-2.052)	-0.80(-2.081)	-0.27(-2.071)
Profession				
landlord / agricultural labourer ⎫ merchant / trader ⎬ farmer ⎰	0.65(2.087)	0.22(2.105)	0.58(1.833)	0.20(1.842)
government/public sector	1.24(2.403)	0.43(2.452)	1.17(2.196)	0.40(2.241)
Household characteristics				
rural house	-1.28(-3.751)	-0.44(-3.783)	-1.30(-3.781)	-0.44(-3.809)
separate room	-1.26(-2.302)	-0.44(-2.312)	-1.20(-2.186)	-0.41(-2.193)
Reasons for not dealing with the formal sector				
bureaucracy ⎫ religious ⎪ distance ⎬ treatment ⎪ bankruptcy ⎰	-0.69(-2.802)	-0.24(-2.758)	-0.62(-2.470)	-0.21(-2.417)
cost ⎫ collateral ⎰	0.53(2.060)	0.18(2.061)	0.62(2.252)	0.21(2.269)
formal loan			0.32(1.120)	0.11(1.130)
R^2	0.79		0.79	
Heteroskedasticity	51.33 **17**		49.74 **18**	

t-ratios in brackets.

figures in bold indicate degrees of freedom.

heteroskedasticity, indicating that the standard errors should be viewed with some caution.

The first result that should be noticed from Table 4 is the dominance of financial variables in the determination of whether or not an individual has an informal loan, though the interpretation of the sign of these variables is more problematic. In the introduction, it was suggested that the informal financial sector might lend money to those individuals who have previously failed to obtain funds from the formal sector. Since it might be expected that those with little income or wealth are more likely to be refused formal loans then it is these people who would be expected to obtain informal loans. With regard to this prediction, the results are mixed. Those people whose living standard[15] is low are more likely to borrow from the informal sector as are those individuals with low levels of saving. This suggests that people prefer to fund themselves if at all possible, and will run down their savings rather than borrow-turning to the informal sector only as a last resort. This also helps to explain why the ownership of gold has a negative effect on the probability of having a loan. That is, individuals will liquidate their gold holdings if the need for funds arises. In contrast however, income has a positive and increasing effect on the probability of having an informal loan. It should be remembered however that we are observing not whether an individual desires a loan but whether or not an individual has a loan. Our observed variable is therefore a product both of the desire for a loan as well as success in getting a loan. The income variable may thus be reflecting the fact that high income earners have a greater ability to obtain informal finance. This might be for a number of reasons; firstly, lenders may think that are more likely to get back the principal in a reasonable period if the borrower has a high income; secondly, since informal loans are often obtained from relatives, and income is highly correlated between family

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[15] 'Living standard' is an index of the availability to the household of durable goods, water, toilet, transport and communication

members, then the income variable may be acting as an instrument for the fund of monetary resources available for the individual to draw on.

Renting land to other individuals might also initially be thought to be an indicator of the wealth of the individual. However the agricultural land market in Egypt is highly regulated, with all rented land contracts being controlled by the Government. The reality is therefore that tenants are usually in a strong position. Renting land to other people might therefore be taken as an indicator of relative illiquidity rather than wealth.

With regard to the main sources of income, individuals who have a waged income are less likely to borrow from IFMs. Since wages represent a more secure source of income than that obtained from projects, real estate or financial assets this might suggest that individuals are borrowing in the informal credit market to meet unexpected shortfalls in income.

With regard to type of dwelling, those individuals who live in rural houses or separate rooms in shared houses are less likely to borrow from the informal financial market. These individuals are generally of low income and wealth.

In summary, the picture obtained of those who borrow in the informal financial sector is complex. Whilst it is the case that financial variables prove to be key determinants of whether or not an individual has an informal loan, the pattern is not entirely consistent. Although it appears to be the case that those who are unlikely to obtain formal credit turn to the informal financial sector to obtain loans, those with very high incomes also borrow informally. This may reflect a higher success rate in loan 'applications' on their part.

6. The Formal and the Informal Sectors Compared.

Table 5 allows a comparison of those factors which affect the determination of loans in the informal and the formal financial sectors. Columns one and two contain the parsimonious results for the formal and the informal financial sectors respectively. Columns three and four then contain equations for the informal and formal financial sectors conditioned on a common subset of variables. This allows a strict comparison across the equations to be made.

As has been mentioned previously, financial variables prove to be important in the determination of which individuals have loans in both the formal and the informal sectors. Thus, the level of income and savings appear in both equations. The ownership of assets appears to be more important from the point of view of obtaining loans in the formal sector, a result which is perhaps not surprising given that the need for collateral is of much greater importance in this sector. Finally, personal characteristics seem to be of greater statistical importance in the determination of loans in the formal sector.

Table 5: Demand for loans in the formal and informal sector: a comparison

	parsimonious probit model		generalised probit model	
	Informal	Formal	Informal	Formal
constant	-2.18(3.566)	-5.16(-2.925)	1.51(1.296)	-6.64(-2.601)
villages				
Shahawy	1.34(3.434)	-1.08(-1.943)	1.36(3.329)	-0.23(-0.452)
Shukr	0.71(2.208)		0.70(1.878)	0.99(1.376)
Asneat	0.71	-1.25(-1.947)	0.73(1.793)	-0.42(-0.647)
Menshat		-1.03(-1.692)		
Individual characteristics				
female		-2.68(-2.148)	0.37(0.578)	-3.14(-2.366)
below general certificate		1.08(2.057)	0.38(1.017)	1.49(2.119)
married/widowed		-1.64(-1.705)	0.37(0.613)	-1.73(-1.620)
income/1000	0.28e-1(0.288)	0.50(3.033)	0.74e-1(0.695)	0.48(2.144)
(income/1000)^2	0.48e-2(2.731)	-0.82(-1.802)	0.35e-3(0.091)	-0.58e-2(-0.976)
own land		1.37(3.603)	-0.77(-0.240)	1.66(3.201)
rent land from		2.13(3.783)	-0.34(-0.853)	2.50(3.520)
total assets/1000		-0.17e-1(-3.058)	0.42e-2(0.708)	-0.26e-1(-2.699)
living standard	-0.25e-1(-2.556)		-0.31e-1(-2.617)	0.17e-1(0.905)
rent land to	0.86(2.103)		0.58(1.156)	0.76(0.622)
savings/1000	-0.88(-2.992)	-0.99(-3.625)	-0.95(-3.504)	-0.99(-2.856)
loan refused		2.28(2.695)	0.21(0.500)	2.50(2.494)
main source of income				
wages, public sector	-2.23(-3.820)		-2.23(-3.399)	0.45(0.536)
wages, private sector} wages, agriculture }	-0.88(-2.922)		-0.83(-2.022)	-0.69e-1(-0.103)
own gold	-0.78(-2.062)	0.93(1.471)	-0.84(-2.124)	0.97(1.301)
Profession				
landlord/agricultural labourer	0.65(2.087)	2.30(2.980)	0.47(1.038)	2.86(2.936)
merchant/trader	0.65	3.85(4.119)	0.94(1.696)	4.41(3.725)
farmer	0.65	2.27(3.347)	0.73(1.618)	3.14(3.479)
government/public sector	1.24(2.403)	2.94(3.945)	1.37(2.376)	2.79(3.175)
Household characteristics				
household size		1.26(2.705)	0.69e-1(0.242)	1.13(2.082)
household size sq.		-0.87(-2.474)	-0.49e-2(-0.216)	-0.75e-1(-1.821)
rural house	-1.28(-3.751)		-1.15(-3.118)	0.90e-1(0.188)
separate room	-1.26(-2.302)		-1.02(-1.766)	-6.07(-0.122)
Reasons for not dealing with the formal sector				
bureaucracy	-0.69(-2.802)	1.34(2.377)	-0.30(-0.734)	1.46(1.970)
distance	-0.69	1.34	-0.55(-0.510)	1.96(1.154)
religious	-0.69	-2.29(-4.175)	-0.31(-1.069)	-2.57(-3.859)
treatment	-0.69	-2.07(-1.841)	-0.32(-0.549)	-2.84(-1.848)
bankruptcy	-0.69	-1.04(-1.644)	0.39e-1(0.053)	-1.36(-1.129)
cost	0.53(2.060)	-1.29(-2.804)	0.11(0.348)	-1.47(-2.754)
collateral	0.53	-1.04(-2.131)	0.27(0.752)	-0.71(-1.214)
confiscation			0.11(0.166)	-0.14(-0.145)
taxes			-0.29(-0.603)	0.63e-1(0.089)
no need		-3.00(-2.572)	-0.21(-0.486)	-3.79(-2.189)

7. Bivariate Probit Estimations

In an attempt to further assess the interaction of the formal and the informal financial sectors, the next section models the determination of loans in the two sectors jointly. The approach adopted will be the bivariate probit model, which has the following econometric specification:

$$y_{1i}^* = \beta_1' x_{1i} + \varepsilon_{1i} \qquad\qquad y_{1i} = \begin{cases} 1 & y_{1i}^* \geq 0 \\ 0 & y_{1i}^* < 0 \end{cases}$$

$$y_{2i}^* = \beta_2' x_{2i} + \varepsilon_{2i} \qquad\qquad y_{2i} = \begin{cases} 1 & y_{2i}^* \geq 0 \\ 0 & y_{2i}^* < 0 \end{cases}$$

$$(\varepsilon_{1i}, \varepsilon_{2i}) \sim \text{BVN}(0,0,1,1,\rho)$$

Where, for the purposes of our model:

y_1^* = propensity of an individual to have a loan with the formal sector

y_1 = observed formal sector status

y_2^* = propensity of an individual to have a loan with the informal sector

y_2 = observed informal sector status.

Thus, each individual is assumed to possess a propensity to have an informal sector loan (y_{2i}^*) and although this is not directly observable, when the propensity becomes positive then the individual is observed to have a loan. This is identical to the standard latent variable approach for probit models. However, in the bivariate probit framework the individual is also assumed to possess a propensity to have a formal sector loan (y_{1i}^*) which again is observed if the propensity is positive. The fact that the propensity to have a loan in the informal and the formal sectors may be correlated is allowed for by letting the error terms in the membership and coverage equations be

correlated (with correlation coefficient ρ). The results of the bivariate probit model are shown in Table 6.

As can be seen the effect of allowing the error terms of the formal and the informal sector equations to be correlated is small, with the size and the sign of the coefficients remaining approximately the same as when the equations were estimated using single equation techniques. Further, although there is some evidence of collinearity amongst the variables causing the t-ratios of the coefficients to fall, the correlation coefficient has a very low level of statistical significance. From these equations there does not appear to be a simple correlation, either positive or negative, between the propensities to have loans in the two markets.

One explanation of the failure of the bivariate probit model to pick up an interaction of the formal and the formal financial sectors may be found in the detailed results of the survey. These indicate that informal financial transactions are heterogeneous and occur in several sub-markets that make up the informal financial market. It seems to be possible to distinguish between four categories of informal finance: occasional lending; regular lending; inter-linked credit; finance through collective arrangements.

Under occasional lending we include all direct intermittent loans by individuals with a temporary surplus of funds [16]. This type of lending arises in the absence of personal consumer credit and small enterprise loans. These are usually between relatives and friends whose relations are governed not by market mechanisms but rather by social relations. These loans are predominantly interest free for consumption purposes though they are sometimes based on the principle of profit and loss sharing in the case of production purposes. Generally they have flexible terms and no collateral requirements.

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[16] See Ghate (1992), p 23.

Table 6: Demand for loans in the formal and informal sector

	bivariate probit model		bivariate probit	
	informal	formal	informal	formal
constant	2.15(2.834)	-5.04(-1.539)	1.50(0.873)	-6.51(-1.051)
Shahawy	1.33(2.899)		1.36(2.425)	0.96(0.741)
Shukr	0.71(1.763)	-1.13(-1.311)	0.69(1.289)	-0.31(-0.339)
Asneat	0.71	-1.25(-1.265)	0.72(1.328)	-0.46(—0.490)
Menshat		-1.01(1.118)		
landlord/agricultural. labourer	0.65(1.791)	2.33(2.039)	0.46(0.787)	2.92(1.468)
merchant/trader	0.65	3.80(2.421)	0.98(1.165)	4.40(1.853)
farmer	0.65	2.25(2.372)	0.72(1.159)	3.15(1.982)
govt/public sector	1.22(1.885)	2.97(2.453)	1.35(1.589)	2.81(1.590)
household size		1.23(1.528)	0.83e-1(0.200)	1.10(0.908)
household size sq.		-0.84(-1.446)	-0.64e-2(-0.206)	-0.73e-1(-0.838)
female		-2.69(-1.082)	0.38(0.408)	-3.09(-0.967)
below general certificate		1.09(1.503)	0.38(0.668)	1.52(0.927)
married/widowed		-1.69(-0.904)	0.35(0.464)	-1.74(-0.661)
rural house	-1.26(-2.726)		-1.14(-1.937)	0.10(0.096)
separate room	-1.20(-1.975)		-1.02(-1.507)	-5.94(-0.000)
income/1000	0.32e-1(0.207)	0.51(2.169)	0.74e-1(0.405)	0.48(1.217)
(income/1000)	0.47e-2(0.479)	-0.80(-0.913)	0.39e-3(0.036)	-0.53e-2(-0.457)
own land		1.41(2.787)	-0.78(-0.117)	1.78(1.891)
rent land from		2.13(2.377)	-0.30(-0.500)	2.48(1.686)
total assets/1000		-0.18e-1(-2.441)	0.42e-2(0.378)	-0.26e-1(-1.398)
living standard	-0.26e-1(-2.024)		-0.32e-1(-1.824)	0.16e-1(0.454)
rent land to	0.84(2.087)		0.58(0.886)	0.70(0.229)
savings/1000	-0.88(-2.317)	-0.99(-2.123)	-0.94(-2.016)	-1.00(-1.375)
loan refused		2.32(1.526)	0.20(0.360)	2.59(1.284)
wages public sector	-2.20(-2.903)		-2.21(-2.345)	0.53(0.377)
wages private sector	-0.88(-2.552)		0.83(-1.561)	-0.14(-0.123)
wages from agriculture	-0.88			
religious	-0.69(-2.291)	-2.38(-2.881)	-0.30(-0.788)	-2.67(-1.729)
treatment	-0.69	-2.10(-1.173)	-0.32(-0.438)	-2.97(-0.970)
bankruptcy	-0.69	-1.15(-1.311)	0.36e-1(0.023)	-1.43(-0.576)
distance	-0.69	1.35(1.606)	-0.51(-0.163)	2.05(0.485)
bureaucracy	-0.69	1.35	-0.28(-0.474)	1.51(0.982)
cost	0.53(2.060)	-1.24(-1.874)	0.12(0.245)	-1.40(-1.530)
collateral	0.53	-1.10(-1.599)	0.25(0.496)	-0.82(-0.745)
confiscation			0.13(0.095)	-0.10(-0.040)
taxes			-0.29(-0.412)	0.65e-1(0.052)
no need		-2.99(-1.072)	-0.19(-0.335)	-3.86(-0.834)
own gold	-0.78(-1.743)	1.01(1.012)	-0.83(-1.668)	1.03(0.757)
ρ	0.21(0.549)		0.21(0.378)	

Informal lending can take a more regular form [17] if there exist specialised moneylenders or pawnbrokers. A typical money lender utilises his close knowledge of the borrower and often faces no competition in providing the service given this information advantage he possesses. Consequently loans obtained from this source tend to be relatively expensive, as the demand curve is inelastic. Such loans are considered by potential borrowers as a last resort [18]. Collateral is not of great importance in this type of informal finance unless, of course, the loan is obtained from a pawnbroker. However, this type of lending is very rare in Egypt and is not represented in our sample.

Inter-linked credit occurs when two or more interdependent exchanges are simultaneously agreed upon in the form of a bundled deal [19]. The lender extends credit to the borrower against the latter's commitment to sell crops, in the case of trader-farmer relationship, or providing labour service, in the case of employer-worker. Under inter-linked credit arrangements, the continuing relationship in the other market acts as a substitute for collateral and reduces transaction costs and default risk. The loans in our sample which were in the form of 'bundled deals' might however be better described as 'forward sales'.

Finally informal finance may also take the form of collective arrangements. An example of these arrangements is credit unions in which a group of individuals regularly, or irregularly, deposit funds with a chosen leader. The pooled savings are then lent to the group's members, and in some cases to non members, when they apply for a loan. Members are charged no interest or very low interest. The most common form of collective arrangements is Rotating Savings and Credit Associations- which are known in the financial development literature by the

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[17] See Timberg and Aiyar (1984) for an extensive analysis of this type of informal finance in India.

[18] See Montiel, Agénor and Haque, op cit., p. 13.

[19] See Bell (1988) for a comprehensive analysis of inter-linked transactions.

acronym RoSCA. RoSCA continues to be an important instrument of savings and a significant source of credit[20].

Thus it may be seen that in Egypt the informal financial sector is not a homogenous one. Some forms of borrowing are subject to the payment of either explicit (under the profit sharing principle) or implicit interest (usufruct loans[21]). Other forms of informal borrowing are not market determined but are governed by the social relationship between the lender and the borrower. Given this, it might be expected that some forms of informal finance would interact differently with the formal sector than others.

Some indication of the differing role of the formal and informal sectors may be gauged from Table 7. As can be seen, people who borrow from one market rarely also borrow from the other financial sector for the same purpose, though this is more common if the loan is for production purposes. In addition, borrowing of loans typically tends to be for business purposes in the formal financial sector (agricultural, trade, or industry), whereas a large proportion of the loans in the informal sector are for consumption and social purposes. This helps to explain why the bivariate probit specification failed to pick up any simple correlation between the decisions which are made in the informal sector and those which are made in the formal financial sector. That is, the informal sector is acting as a complement to formal loans for some categories of spending and as a substitute in others. This implies that a future study will need to distinguish between the use to which the loans will be put.

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[20] See Besley, Coate and Lowry (1993) for an analysis of the economics of ROSCAs and for an analysis of ROSCAs in Egypt, see Mohieldin (1994).
[21] See Flora and Yatopoulos for an analysis of usufruct loans and Mohieldin (1994) for some examples from Egypt.

Table 7- The purpose for which loans are borrowed in the formal and informal sectors.

			Informal Sector			
	none	production	consumption	Emmigration	social	other
Formal Sector						
none	83	10	27	4	14	2
agricultural operations	21	5	2	1	2	0
trade	3	5	0	0	1	0
industrial	0	1	1	0	0	0
housing	0	0	0	0	0	0
consumption	3	0	3	0	0	0
social	2	1	0	0	1	0
other	3	1	1	0	1	1
	115	23	34	5	19	5

It also appears from the results obtained in sections 4 and 5 that there is a need to distinguish between the demand for loans and the ability to obtain one i.e. the supply. This is so for both the formal and the informal sector, as there is evidence of credit constraints in each market. It was argued in section 5 that one group of people obtaining loans in the informal market are those without the necessary income or assets to obtain formal finance. It is also the case however that a significant number of people who can obtain loans from the formal sector, also borrow from the informal sector. This may be because, although they can obtain formal finance, they face constraints on the amount that they can borrow. They therefore turn to IFMs to meet any shortfall in loan requirements. Thus it may be argued that the informal financial sector is acting as a safety net in two respects. However, whilst loans in the informal sector appear to be determined more on the basis of social relations than do formal loans, financial considerations are far from redundant. It therefore seems likely that a significant number of people on low incomes would desire a loan but are unable to obtain it from either sector due either to lack of access to funds or due to doubts about their ability to repay.

8. Conclusions

This paper has examined empirically the markets for formal and informal credit in Egypt, using a dataset which was specifically collected for the purpose. The analysis found that the informal financial sector was more active than the formal sector, though the loans obtained were generally smaller.

The paper then examined what factors determine whether or not a person borrows from the formal and the informal financial sectors. These equations were well determined and indicated that financial considerations were of primary importance in the determination of loans in both sectors. The interaction between the two markets is far from simple however, and no simple correlation exists between having a formal sector loan and having an informal sector loan. This is not to suggest however that no interaction occurs between the markets. It was argued that future work will need to take account both of the use to which the loan will be put and the interaction of constraints on the ability to borrow in both markets. The tentative conclusion of this study would be to suggest that, far from being harmful to the process of economic development, informal credit markets appear to at least partially relax the credit constraints imposed on individuals by the formal sector. The funds available for loans in the informal sector are however limited and there is evidence that some form of market failure persists.

Appendix Table One: Descriptive Statistics

Variable	Mean	Std. Dev.	Minimum	Maximum
Shukr	0.40000	0.49113	0.0000	1.000
Shahawy	0.15000	0.35797	0.0000	1.000
Asneat	0.25000	0.43410	0.0000	1.000
Menshat	0. 00	0.40100	0.0000	1.000
Formal loan	0.30000	0.45941	0.0000	1.000
borrowed informally	0.42500	0.49558	0.0000	1.000
Household size	5.6600	2.0236	1.000	11.00
Age	45.975	12.411	-0.057	79.00
Female	0.40000E-01	0.19645	0.0000	1.000

type of dwelling

apartment	0.26500	0.44244	0.0000	1.000
villa/house	0.17500	0.38092	0.0000	1.000
rural house	0.49500	0.50123	0.0000	1.000
separate room	0.50000E-01	0.21849	0.0000	1.000
informal housing	0.15000E-01	0.12186	0.0000	1.000
other	0.00000	0.0000	0.0000	0.0000

possession of dwelling

owned	0.81000	0.39329	0.0000	1.000
rented	0.12500	0.33155	0.0000	1.000
furnished and rented	0.99748E-01	0.0000	1.000	
with job	0.40000E-01	0.19645	0.0000	1.000
squattered	0.10000E-01	0.99748E-01	0.0000	1.000
other	0.50000E-02	0.70711E-01	0.0000	1.000

occupation.

landlord	0.55000E-01	0.22855	0.0000	1.000
agricultural labourer	0.18000	0.38515	0.0000	1.000
artisan	0.14500	0.35298	0.0000	1.000
merchant/trader	0.95000E-01	0.29395	0.0000	1.000
govt/public employee	0.24000	0.42815	0.0000	1.000
private sector employee	0.55000E-01	0.22855	0.0000	1.000
farmer	0.16000	0.36753	0.0000	1.000
unemployed	0.45000E-01	0.20782	0.0000	1.000
Other	0.25000E-01	0.15652	0.0000	1.000

education

below age	0.00000	0.00000	0.0000	0.0000
illiterate	0.26000	0.43973	0.0000	1.000
read/write (barely)	0.30500	0.46156	0.0000	1.000
below general certificate	0.15500	0.36281	0.0000	1.000
general certificate	0.18500	0.38927	0.0000	1.000
higher education	0.95000E-01	0.29395	0.0000	1.000

marital status

below age (14)	0.00000	0.00000	0.0000	0.0000
bachelor	0.60000E-01	0.23808	0.0000	1.000
married	0.88500	0.31982	0.0000	1.000
divorced	0.50000E-02	0.70711E-01	0.0000	1.000
widowed	0.50000E-01	0.21849	0.0000	0.0000

Financial

Income	5716.0	8859.9	1000.	0.8000E+05
Own land	1.8152	11.185	0.0000	150.0
Rent land to (feddans)	0.83150E-01	0.47661	0.0000	5.000
Rent land from	0.17795	0.40630	0.0000	2.500
Total assets	0.14691E+06	0.71075E+06	0.0000	0.9585E+07
Savings	1534.8	4609.2	0.0000	0.4000E+05
Refused formal loan	0.10000	0.30075	0.0000	1.000
Own gold	0.87000	0.33715	0.0000	1.000
Living standard	40.674	22.535	2.040	95.92

Main source of income

wages, public sector	0.25000	0.43410	0.0000	1.000
wages, private sector	0.13500	0.34258	0.0000	1.000
wages agriculture	0.36500	0.48264	0.0000	1.000
Projects in agric/indus	0.60000E-01	0.23808	0.0000	1.000
other projects	0.85000E-01	0.27958	0.0000	1.000
real estate	0.00000	0.00000	0.0000	0.0000
financial assets	0.50000E-02	0.70711E-01	0.0000	1.000
other	0.10000	0.30075	0.0000	1.000

Strong Reason for not dealing with the formal sector

Religion	0.28000	0.45013	0.0000	1.000
Distance	0.25000E-01	0.15652	0.0000	1.000
Treatment	0.50000E-01	0.21849	0.0000	1.000
Bureaucracy	0.14000	0.34786	0.0000	1.000
Cost	0.54500	0.49922	0.0000	1.000
Lack of collateral	0.39000	0.48897	0.0000	1.000
Fear of Bankruptcy	0.11000	0.31367	0.0000	1.000
Fear of confiscation	0.13000	0.33715	0.0000	1.000
fear of taxes	0.17500	0.38092	0.0000	1.000
No need	0.13500	0.34258	0.0000	1.000

Bibliography

Bell, C., (1988), 'Credit Markets and Interlinked Transactions', in Handbook of Development Economics, Volume 1, Edited by H. Chenery and T. Srinivasan, Elsevier Science Publishers B. V.

Besely, T. S. Coate and G. Loury (1993), 'The Economics of Rotating Savings and Credit Associations', The American Economic Review, Vol. 83 No. 4, pp 792-810.

Commander, S. (1987), The State and Agricultural Development in Egypt since 1973, London and Atlantic Highlands NJ: Ithaca Press.

Floro, S. and Pan Yotopoulos (1991), Informal Credit Markets and the Neew Institutional Economics: The case of Philippine Agriculture, Westview Press, Boulder.

Fry, M.J. (1988), Money, Interest and Banking in Economic Development, Baltimore and London: The Johns Hopkins University Press.

Ghate, p. (1992), Informal Finance: some Findings from Asia, Hong Kong: Oxford University Press.

Goldsmith, R. (1969), Financial Structure and Development, New Haven: Yale University Press.

Mckelvey, R., and W. Zavoina (1975), 'Statistical Model for the Analysis of Ordinal Level Dependent Variables', Journal of Mathematical Sociology 4: 103-20.

McKinnon, R. (1973), Money and Capital in Economic Development, Washington, D.C.: Brookings Institution.

Mohieldin, M. (1994), 'Informal Finance in Egypt', paper prepared for the annual Conference of the British Society of Middle Eastern Studies, Manchester University, England.

Mohieldin, M (1993), 'The Rural Financial Market in Egypt', Department of Economics, University of Warwick, England. Mimeo.

Montiel, P., P. Agénor and N. Haque, (1993), Informal Financial Markets in Developing Countries: A Macroeconomic Analysis, Oxford: Blackwell.

Shaw, E. (1973), Financial Deepening in Economic Development, New York: Oxford University Press.

Taylor, L. (1983), Structuralist Macroeconomics: Applicable Models for the Third World, New York, Basic Books, 1983.

Timberg, Thomas and C. Aiyar (1984), 'Informal Credit Markets in India', Economic Development and Cultural Change, Vol.33, pp.43-59.

Von Pischke, J., D. Adams and G. Donald, eds., (1983), Rural Financial Markets in Developing Countries, Baltimore and London: The Johns Hopkins University Press.

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