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Disorganization, Financial Squeeze, and Barter

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Comments Welcome

Disorganization, Financial Squeeze, and Barter

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Abstract

In this paper we explore two explanations of barter in transition economies both of which see barter as an economic institution which helps to cope with the problems arising in the transition. The first explanation sees barter as creating a "hostage" which limits the hold-up problem and this way allows to deal with disorganization. Thus, barter can be seen as an institution which smoothens the transition from the "old" to the "new" regime and which can prevent the output from falling even more than in actually has in the FSU. The second explanation sees barter as inter-firm arrears which are repaid in goods rather than cash. Barter can be used to collateralize a trade credit when firms in TE lack creditworthiness. This way a payment in goods rather than money can mitigate contractual hazards when capital markets are imperfect in TE. Through this credit channel barter can prevent the output from declining even more than it has. The empirical evidence based on 165 barter deals in the Ukraine in 1997 supports both explanations.

1. Introduction

There are three dominant features which distinguish the development in the set of countries of the former Soviet Union from those of the early Transition Economies (TE) like Hungary, Poland, and the Czech Republic. First, the decline in output has been much more pronounced in the former compared to the latter. In Russia, Belarus, Ukraine, and the Baltics GDP for 1996 is estimated to stand at less than half its 1989 level. Second, inter-firm debt and arrears are much larger and growing much faster in Russia, Ukraine and the Republics of the former Soviet Union as compared to the early TE.[2] Third, barter trade has become an important phenomenon in the domestic economy in Russia, Ukraine, Kasachstan, and Romania, while being absent in Central Europe. According to a recent survey in Russia barter accounts for 45 percent of economic activity in 1997. Our survey in 1997 among 55 firms in Ukraine gives a slightly larger estimate of barter in percent of industrial sales of 51 percent. This raises the question whether there is a connection between these three developments. More specifically, what is the relationship between barter and inter-firm debt on the one hand and barter and the output decline on the other? Has barter's presence in the former Soviet Union and its absence in Eastern Europe something to do with the fact that inter-firm arrears are so much larger and output has declined much more sharply in the former Soviet Union?

In this paper we explore two explanations of barter in transition economies both of which see barter as an economic institution which helps to cope with the problems arising in the transition from the plan to the market. In a recent paper Blanchard and Kremer (1997) argue that the extremely large decline in output in the former Soviet Union as compared to the early TE has been caused by "disorganization" and hold-up problems. Disorganization arises when old relationships break down before new ones can be established leading to a decline in output of the economy. Disorganization and specificity have posed a more severe problem for more insulated TE like the former Soviet Union, while in open economies like Central Europe entry of foreign firms alleviated the problems of small numbers. In Russia, Ukraine and other countries of the former Soviet Union other mechanisms than international trade and foreign direct investment must have been at work to limit the adverse effects of specificity. We will argue in this paper that barter - tying two deals - can be seen as such a mechanism which helps to

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See Table 1, Statistical Tables, The Economics of Transition, Vol 4 (1), 1996, Oxford University Press.

See Rostowski 1996.

See Russian Economic Barometer 1997. We conducted a sample of 165 barter deals among 55 Ukrainian firms in 1997. For a description of the data see section 2 of this paper.

overcome the problem of small numbers in the transition. Barter creates a "hostage" which limits the hold-up problem to materialize. This way barter can be seen as an economic institution which smoothens the transition from the "old" to the "new" regime and which can prevent the output from falling even further. If this explanation is correct, then barter is observed in the former Soviet Union while being non-existent in Eastern Europe, because disorganization and the output decline are more severe in the former than in the latter region. [4]

The second explanation of barter in TE in this paper relates to the literature on inter-firm debt as a phenomenon of imperfect financial markets. [5] Inter-firm debt and barter trade are viewed as the same phenomenon. In a barter trade one firm gives a trade credit to another firm (inter-firm debt) which is repaid in goods rather than money. Because goods are less anonymous than money, a claim on goods is easier to enforce than a claim on cash. Barter can be used to collateralize a trade credit when firms in TE lack creditworthiness and thus banks are reluctant to provide capital at reasonable interest rates. This way barter - a payment in goods rather than money - can mitigate contractual hazards when capital markets are imperfect and it makes financing of business activities possible which otherwise would not take place. Through this credit channel barter can prevent output from declining even more.

The paper is based on ideas in earlier work on international countertrade by Marin and Schnitzer (1995, 1997) in which we show that international barter is an efficient institution to solve moral hazard problems which arise in the technology transfer to developing countries and in international trade with highly indebted countries. The contribution of this paper is to point to the potential importance of the institution of barter in the context of transition.

The analysis of this paper stands in contrast to other explanations of barter in transition economies. Among the most important explanations are tax avoidance, delay in restructuring, and lock-in. Barter is seen by many experts to allow to avoid paying taxes by distorting the true value of profits. In addition, the banking sector is used as a tax collection agency by transferring firm's incoming cash on bank accounts to the state to pay for outstanding tax arrears. This way a payment in goods allows to circumvent paying taxes. Furthermore, delay in privatization and inefficient governance structures are seen to lead to quantity targeting

[4] Oliver Williamson introduced the concept of a hostage to facilitate exchange, see Williamson (1983).
[5] See Calvo and Coricelli (1995), Ickes and Ryterman (1992, 1993).

rather than profit maximization. The absence of hard budget constraints leads managers and workers to avoid the costs arising from restructuring by maintaining production in inefficient activities. Barter is seen to help to conceal the true market value of output. A third explanation of the use of non-monetary market exchange which is complementary to the explanation of this paper accounts for its persistence over time once reciprocal exchange is established. When more people engage in barter, market search costs increase and thus it becomes harder to exchange goods for money and the incentive to maintain "personalized" exchange increases. Through this lock-in and network effect, this explanation points to possible long-term costs of using barter as an exchange system, because the latter system can persist even when it is inefficient. It cannot, however, explain, why barter started to exist in the first place in the former Soviet Union in 1994.[7]

The paper is organized in the following sections. Section 2 gives some stylized facts about barter in the Ukraine from a survey among 55 firms. The data consist of 165 barter deals in 1997 from three cities: Kiev (50 percent), Saporoshje (30%), and Dnepropetrovsk (20%). Section 3 then looks at the relationship between the output decline and barter and provides some evidence. Section 4 analyzes inter-firm debt and barter as phenomena to deal with imperfect capital markets and gives evidence in support of this view. Finally, section 5 concludes and discusses some policy questions.

2. Some stylized facts

In this section we will look at some of the features of barter in the Ukraine based on a survey of 165 barter deals among 55 firms in three cities in the Ukraine in 1997.

Table 1 shows that barter accounts for on average 51 percent of firm's sales with a minimum barter share of 1 percent and a maximum share of 100 percent. The barter deals are typically large in size ranging between U$ 10 and U$ 5.000.000 with a mean size of U$ 145.534. Furthermore, barter occurs especially in the machinery and vehicle sector (48 percent of bartering firms are from this sector) and in the basic sector (24% of bartering firms).

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[7] See European Bank for Reconstruction and Development, Transition Report 1997, p. 26 -27.
See R.E. Kranton (1996).

Table 2 looks at the question whether barter can be explained by problems of governance. Barter does not seem to be a phenomenon of state owned enterprises. Newly established private firms show the same or higher barter exposure as state owned firms or cooperatives. The average barter share of state enterprises is 56.6 percent and that of private firms 58.3 percent. In addition, Table 3 shows that there is no relationship between the barter intensity of the firm and the productivity of the firm, if at all the relationship is positive (the correlation coefficient is 0.05). This evidence suggests that neither soft budget constraints nor a reluctance to move into efficient activities seem to be the driving force behind barter. The data do suggest, however, that barter is at least as often a business of an old network as it is not. The parties have in 46 percent of the cases known each other from previous interactions. We have also ask the firms whether there was a tax advantage reason for using barter. Only 9.5 percent of the barter deals were motivated by taxes in which firms answered that taxes were a very important or important reason to engage in this form of exchange (see Table 4). Even if one takes into account that the data have some noise, it does suggest that tax reasons are not the major motivation behind barter.

Table 1: Some descriptive statistics
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Table 2 Ownership, Debt, and Barter
here
Table 3 Barter and Efficiency
here

The data show on the example of the Ukraine (for similar results for Russia see REB 1997 and Transition Report 1997) that barter is a dominant and growing phenomenon of the former Soviet Union. Furthermore, the tables indicate that the two common explanations of barter - the lack of market discipline and tax avoidance - are not supported by the data. An explanation of barter has therefore to be found somewhere else. More specifically, any explanation of barter has to address the following two questions: First, why would parties want to tie two deals? Second, why would parties want to pay in goods rather than money? Before we come to a specific answer to these questions I turn to the answers given by the firms themselves.

In Table 4 it can be seen that barter is predominantly motivated by financial reasons. In 87.5 percent of the deals barter was used because there was no cash available. In 29 percent of the barter deals the firm

could not get a loan even when ready to pay a high interest rate.[1] In 72 percent of the cases the party used barter, because she expected to be paid faster in this form of exchange. Also an important reason for barter seems to be to smooth production. In 66 percent of the cases the firm could use goods stored as inventories as means of payment in barter deals and in 12.5 percent of the cases the firm used barter, because it was the only way to maintain production.[2] Additionally, barter was used as a way to change the relative price for the good in question in 20.8 percent of the deals.

In the following two sections we will look at two alternative explanations of barter which are consistent with the data. Firms might want to tie two deals and they might want to pay in goods rather than money because by doing so they can solve incentive and hold-up problems which otherwise would prevent trade from taking place at all. In the next section we turn to barter as a mechanism to smoothen the output decline by helping to cope with disorganization.

Table 4: Motives for Barter
here

3. Disorganization and Barter

In a recent paper Blanchard and Kremer (1997) explain the rapid output decline in the former Soviet Union by disorganization. Central planning was characterized by a complex set of specific relations between firms. Many firms had only one supplier from which to buy and knew of only one or a few buyers to whom to sell. Such an environment with little outside opportunities - called specificity - typically creates hold-up problems and opens room for bargaining. Under central planning the main instrument to enforce production and delivery of goods was the coercive power of the state. Transition eliminated the central planner and thus the instrument to limit the adverse effects of specificity without having created yet the institutions to deal with specificity such as vertical integration and contracts that exist in the West. Furthermore, in times of transition the anticipation of changing business partners and the disappearance of firms shortens horizons and reduces the scope for long term relationships. Thus, in such a "no future" environment a typical mechanism to constraint

[1] The answers do not include cases when the firm did not take a bank loan, because of too high interest rates.

[2] We added this question to the survey during the period of firm interviews, because firms often spontaneously gave this as a reason for why they engage in barter. The later inclusion into the survey leads to an underestimation of the true response to the question "maintaining production".

opportunistic behavior such as reputation does not work. Blanchard and Kremer (henceforth BK) argue that specificity in the relations between firms together with incompleteness of contracts results in disorganization - the breakdown of many economic relations before new ones can be established - which in turn explains the large output losses.

In the BK model specificity arises in a chain of production in which the primary input supplier stands in the beginning of a chain of production and after n steps the final good is produced. Each buyer along the chain knows only the supplier it was paired with under central planning. The primary input supplier has an alternative use for the input while all intermediate producers along the chain of production are assumed to be able to sell to the next following buyer only. BK formulate the hold up problem by assuming that it is impossible for each firm in the chain to sign a contract with the buyer (the next firm in the chain) before it has produced the good. Each firm must first buy inputs and produce, and only then - once the cost of producing is sunk - can strike a bargain with the next producer in the chain. At this stage, however, each intermediate producer's reservation value is zero and thus the next producer in the chain can "hold him up" and exploit his dependency by offering to purchase the good at a price only which does not cover each intermediate producer's costs. In anticipation of being "hold-up" by the next following firm each intermediate producer will not deliver inputs to the next producer and thus the chain of production breaks down. In the BK model output collapses because firm relations are specific (the intermediate producers cannot sell the good to someone else) and because contracts are incomplete (each intermediate producer must produce its intermediate good before bargaining with the next producer along the chain). If the government retained its coercive power it could force suppliers to deliver and thus output would not decline.

Is there another mechanism than the coercive power of the state by which intermediate producers can be induced to deliver the input and next producers in the chain can be prevented from reneging and asking for a lower price? We claim yes. Barter can be seen as such an institutional arrangement which helps to deal with the hold-up problems just described.[3] Barter - tying to deals - introduces a "hostage" in the form of a second deal (the goods payment with which the input is paid with) which helps to avoid that intermediate producers in the chain will be hold-up. If hold-up takes place in the first deal (in the input sale), the valuable second deal (the goods payment for the input) gets lost and thus "punishes" the firm that holds up in the first deal. Barter is a self enforcing arrangement

[3] Greif and Kandel (1994), Hay and Shleifer (1998) point out that the deficiencies of the legal system are more pronounced in the FSU compared to the early TE.

which makes the firms along the chain of production to loose from reneging the contract. This way barter can help to cope with specificity without relying on the legal system and thus helps to smoothen the transition from the "old" to the "new" regime leading to a smaller output decline. [::]

In order to see whether this story makes sense empirically we will look at the relationship between the firm's change in output and its exposure to barter. One implication of our explanation of barter's role in the transition is that the decline in output should have been less pronounced for firms who were less hit by problems of specificity because of a larger barter exposure.

We gathered data of 165 barter deals from 55 Ukrainian firms in 1997. Although the unit of analysis of the survey was a barter deal, the survey included some information of the firms involved in the deals. First, we constructed an output growth variable. This variable is defined by the growth of output between 1994 and 1996 of the firm relative to the average growth rate between 1994 and 1996 for the total sample of 55 firms. If our explanation of barter is correct, then a firm with a larger barter share should have experienced a less severe output decline relative to the total of all bartering firms in the sample. We looked also at the growth rate of output of the firm relative to the growth rate of GDP of the Ukrainian economy in the same period. We report both results in Table 5.

Table 5: Barter and Output Decline
here

The table shows (column 1) that firms with a share of barter in output of up to 20 had a growth rate of output of 0.3 percentage points lower than the total economy, while firms with a barter share between 20 and 60% experienced a growth rate of 1.37 percentage points higher than the total economy. However, when the exposure to barter becomes too large (exceeds 60%), then the firm's output appears to have grown 1.29 percentage points less than the economy as a whole. These findings suggest that there is an optimal level of barter at which the output decline is minimized. The relationship between output growth and barter exposure is statistically

[::] For the use of barter as a hostage in international trade see Marin and Schnitzer 1995.

firm's output growth is related to the growth of the total of 55 firms of the sample instead to the economy as a whole (column 3 of Table 5).

Second, we have added two additional variables to look at some of the other factors which may have contributed to output growth. The first variable included is BK's index of complexity. According to their theory the hold-up problem becomes more severe and thus the decline in output more pronounced for goods with more complex production processes. Their measure of complexity is constructed on the bases of the 1990 "100-sector" input-output table for Russia. Complexity is equal to zero if the sector uses only one input from another sector and it tends to one if the sector uses many inputs in equal proportions. We matched the ISIC sector of our bartering firms with the sector of the complexity index given by BK. This measure is obviously full of noise for several reasons. BK's complexity index is based on the Russian input-output structure which might differ from that in the Ukraine. Further noise might be introduced because the production structure in the Ukraine might have changed since 1990. Finally, the ISIC classification of our sample could not always be perfectly matched with BK's classification of the index. In spite of all these caveats, we could reproduce BK's findings with firm level data. Table 5 reports that the firm's output declined more rapidly compared to the output of the economy when the firm's production was more complex. Firms producing goods which rank low in the complexity index increased their output by 1.8 percentage points compared to the economy as a whole, while the opposite was true for firms with goods which ranked high on the complexity scale. Again, the same picture emerges when the firm's output growth is compared with the average growth of the 55 firms of the sample rather than the economy as a whole. The association between the firms relative growth and the complexity measure was highly significant.

Next, we added the ownership pattern to the analysis to see whether it matters for the growth performance. It appears that private enterprises are those with the least well performance in terms of output growth. The relationship between ownership pattern and relative output growth is not significant at conventional levels, however.

4. Inter-firm Arrears and Barter

The literature on inter-firm debt in transition economies asks the following question. Why are firms giving loans to other firms when the same firms are not considered creditworthy enough by the banks and therefore do

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Schnitzer 1995.

not get loans from banks? The answer that is most commonly given is the absence of market discipline. State-owned firms who are seen to show the highest inter-firm debt are seen to be able to get loans from other firms because of the soft budget constraint. But if the state-owned firms are creditworthy because of the backing of the government, they are expected to be the least credit constrained and thus to show the highest bank debt. As Table 2 shows, in our sample of bartering firms this is indeed the case. State-owned firms appear to have on average higher bank debt (7.5 percent of output) while private firms have negligible bank debt outstanding (0.1 percent of output). However, state owned firms show also the highest inter-firm arrears compared to private firms (68 percent and 24 percent of output, respectively). This suggests that state firms used their privileged status of creditworthiness to get cash credit from banks as well as trade credit from other firms.

An explanation for the phenomenon of inter-firm debt cannot, however, rest exclusively on the argument of soft-budget constraint. Inter-firm arrears are not a phenomenon of state firms alone. In our sample of bartering firms only 29 percent are state controlled. Therefore, there are additional forces at work here, which go beyond the lack of market discipline.We see this force in the problem of creditworthiness. The capital and credit market does not function well in transition economies because of the following reasons. Creditors are inexperienced with credit evaluation. Banks have difficulties in distinguishing bad from good debtors. There is no history which allows to judge the credit risk because of the drastic changes in the environment. In some of the transforming economies a bankruptcy law has not yet been introduced. Defaulting on debt repayment remains without consequences and therefore firms have little incentive to repay their loans from banks.

Many experts have suggested that one of the solutions to inter-firm debt is to restore the creditworthiness of firms by introducing a bankruptcy procedure. But in many countries like Hungary and Ukraine, for example, a bankruptcy law has been introduced and inter-firm debt has not stopped from rising. Furthermore, a recent study by Mitchell (1993) suggests that the introduction of a bankruptcy law by itself will not improve debt repayment because creditors did not use the bankruptcy procedure to get to their money. Among other factors Mitchell's explanation for this creditor's passivity is the expected low value of creditor's claims net of bankruptcy costs. The expected value of creditor's claims is seen to be low (near zero) because of the poor state or vintage of the capital stock of a debtor firm, the absence of a market for capital, and the priority assigned to a creditor in a bankruptcy relative to the ordering of other creditors. Mitchell's explanation suggests that inter-firm debt is not going to go

away with the introduction of a bankruptcy law and that creditor's passivity prevents bankruptcy to restore the creditworthiness of firms.

The question remains: Why are firms able to give loans to other firms when the banking sector is reluctant to provide capital in spite of the availability of a bankruptcy procedure to pursue non paying debtors? The possibility of undertaking a business in form of barter trade becomes important in this context. In a barter trade one firm gives a trade credit to another firm which is repaid in goods rather than money. Barter trade offers the following advantages.[12]

First, barter does not attempt to improve the overall creditworthiness of firms (as in bankruptcy) but rather restores the creditworthiness of the firm for one specific deal. In a barter deal a deal specific collateral is created in the form of the future goods payment. Depending on the degree of the creditworthiness problem of the debtor, the creditor can choose the value of the collateral relative to the trade credit that he gives to the debtor. This way the debtor's creditworthiness is restored for one specific deal. Giving a trade credit in the form of a barter deal is available to firms only, since banks are not allowed to engage in the trading business. The option of improving a debtor's creditworthiness by doing a barter deal is therefore not available to banks which explains why firms are able to give loans when banks are reluctant to do so.

Second, in the early stage of transition barter trade can substitute for creditor's passivity with respect to using a bankruptcy procedure to pursue defaulting debtors. Instead of relying on the low and unknown liquidation value of the firm (as in bankruptcy), the creditor and debtor create a deal specific collateral of positive and known value. Furthermore, in a barter trade the creditor does not need to share the benefits from her legal actions against a defaulting debtor with other creditors. In a barter deal the creditor obtains property rights on goods which effectively means that she does not need to queue with other creditors for the money. Compared to bankruptcy, in a barter trade there is no priority ordering of creditors. This makes payment in goods a superior credit enforcement mechanism compared to payment in money. Compared to bankruptcy the known and positive value of the deal specific collateral in barter with no priority ordering of creditors gives the creditor a greater incentive to pursue legally a non paying debtor. This way, barter trade can be a remedy against creditor's passivity in the early stage of transition.

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[12] For barter as a finance instrument in international trade see Marin and Schnitzer 1997.

Third, barter is a more information-intensive form of financing. Typically a trade credit is given between two firms which know each other from previous transactions (one firm is a producer and the other firm is an input supplier). This way, the problem of credit evaluation, which the bank has, might not arise.

Table 6 looks at whether within barter a trade credit is, in fact, given. In 36.9 percent of the deals a trade credit was given within the barter deal. The time period between the sale and the goods payment varied between 1 month and 7 month. In 20 percent of the deals the parties did not make an agreement on the termination of the credit. Table 7 shows that when a trade credit was given the parties agreed on it ex-ante in 16 percent of the barter deals only. In 17 percent of the cases a trade credit was given ex-post by the selling firm, because the buyer was unable or unwilling to pay.

Table 6 Barter as Credit
here
Table 7 Trade Credit: Ex-ante and Ex-post
here

Table 8 reports on the outstanding debt of bartering firms and examines whether there is a relationship between the size of the firm's outstanding debt and the extent to which the firm engages in barter. Firms who barter tend to have very large outstanding bank debt, firm debt and outstanding tax arrears (exceeding 100 percent of firm sales in 1996). This suggests that these firms had very little creditworthiness to obtain further credit. If our explanation is correct, we expect a positive association between the barter share of the firm and its outstanding debt and a negative association between the barter share and bank debt. Barter can help firms with weak overall creditworthiness when they cannot get a bank loan by restoring their creditworthiness for one particular deal. The table shows that the barter share of the firms indeed tends to increase with outstanding firm, wage, and tax arrears. At the same time barter tends to be lower for those firms which have access to bank loans. Furthermore, a simple correlation between the firm's bank debt with its firm arrears reveals a weak negative correlation between the two (the correlation coefficient is -0.185) once the state firms are excluded suggesting that firm debt helped to compensate the liquidity squeeze induced by low bank debt for those firms in the economy with restricted access to bank loans.

It seems then, that barter has played a role to alleviate the liquidity squeeze.[12]

Table 8: Barter and Creditworthiness

5. Conclusions

[12] Calvo and Coricceli (1993) use a negative correlation between bank debt and firm arrears as evidence for whether inter-firm arrears helped to compensate for the liquidity squeeze in their argument for the role of credit as a factor explaining the output fall in Poland. According to this argument a positive correlation between bank debt and firm debt would indicate that firm debt has not alleviated the liquidity squeeze.

Descriptive Statistics

	mean	min	max	cases
barter in percent of output	51	0	100	313*
size of barter deal in US-Dollars	135.679	10	5.000.000	150
Industry classification				
machinery and vehicles	D = 1	48 observations		165
basic industry	D = 1	24 observations		165

*The number of firms exceeds the number of barter deals because each deal involves two firms (a seller and a buyer). The percentage given in the table is the mean over the total of selling as well as buying firms.

Source: Survey of 165 barter deals among 55 Ukrainian firms in 1997

Table 2

Ownership, Debt, and Barter

	in percent of output			
	bank debt	firm debt	tax arrears	barter share
	mean values of respective variables			
domestic state enterprise	7,5	68,0	4,8	56,6
domestic private firm	0,1	23,8	1,6	58,3
foreign or GUS firm	-	-	0,0	48,0
cooperative or collective firm	6,3	16,9	9,6	44,8
worker	-	-	-	50,4
the government	-	-	-	10,8
joint-venture	3,0	13,7	0,0	34,6
Total	5,9	32,0	6,5	51,0
F - Test	0,5	1,5	1,2	4,2
Sign. Level	(0,789)	(0,180)	(0,315)	(0,000)

The percentages in the table refer to the number of firms rather than the number of barter deals. The number of firms exceeds the number of barter deals because each deal involves two firms (a seller and a buyer). The percentages given in the table are the mean over the total of selling as well as buying firms.

Source: Survey of 165 barter deals among 55 Ukrainian firms in 1997

Barter and Efficiency

	barter share in percent of output		
	mean	std. dev.	cases
efficency*	45,61	28,4	153
1.000 - 7.000	48,18	29,9	57
7.100 - 15.000	44,05	27,6	60
15.100 - 140.000	44,17	27,8	36
F = 0.366 sign. level 0.694			

*Output in US$ per employee
The Pearson correlation coefficient between the barter share and efficiency is 0.05.

Source: Survey of 165 barter deals among 55 Ukrainian firms in 1997

Motives for Barter

	1997 in percent[1]
no cash	87,5
no bank loan	29,1
no trust in the value of money	6,0
faster payment compared to cash payment	72,1
no struggle with other creditors	7,8
no courts to enforce rights	6,0
to maintain production	12,5
goods in stock could be used	66,1
liquid good	1,8
better deal on the price in barter	20,8
reducing the tax burden	9,5
avoiding controls on foreign trade	1,8
reducing regulations	6,0
capital flight to the west	0,0
state pressure	1,8
others	1,2

[1] answers have been ranked between very important and irrelevant. The percentages give the very important plus important responses.

Source: Survey of 165 barter deals among 55 Ukrainian firms in 1997

Table 5

Barter and Output Decline

		firm's output to GDP growth [1]		firm's output to sample growth [2]		
		mean	std. dev.	mean	std. dev.	cases
1.	barter share	0.01	4,2	2,60	15,0	153
	0% - 20%	-0,31	1,9	1,46	6,7	46
	20% - 60%	1,37	6,4	7,43	22,8	58
	60% - 100%	-1,30	0,4	-2,05	1,3	49
		F = 5.84	sign. level 0.004	F = 5.84	sign. level 0.004	
2.	complexity[3]	0,14	4,4	3,05	16,6	141
	.34 - .78	1,84	8,0	9,10	28,4	33
	.79 - .83	0,48	2,9	4,28	10,4	36
	.84 - .92	-0,82	1,6	-0,35	5,5	72
		F = 4.543	sign. level 0.012	F = 5.84	sign. level 0.004	
3.	ownership	0,01	4,2	2,60	15,0	153
	state	0,14	2,9	3,06	10,2	40
	privat	-0,85	1,2	-0,47	4,4	12
	cooperative	0,16	5,1	3,12	18,1	92
	joint-venture	-0,92	0,1	-0,70	0,2	9
		F = 0.356	sign. level 0.785	F = 0.356	sign. level 0.785	

[1] Percentage difference in the growth rate between output of the firm and GDP in the period 1994 and
[2] Percentage difference in the growth rate between output of the firm and the output of the sample of
[3] See text for definition

Source: Survey of 165 barter deals among 55 Ukrainian firms in 1997

Table 6

Barter as Credit[1]

	ex ante	actual
	in percent	
prepurchase	14,9%	14,3%
no termination point	20,2%	-
0 month	46,4%	46,4%
1 month	9,5%	16,1%
1 - 3 months	7,1%	12,5%
3 - 7 months	0,0%	8,3%
missings	1,8%	2,4%
Total	100,0%	100,0%

[1]time period between "sale" and "goods payment"
Source: Survey of 165 barter deals among 55 Ukrainian firms in 1997

Table 7

Trade Credit

Ex-Ante

	in percent
no	81.5
yes	16.1
not applicable	0.6
missing	1.8
Total	100.0

Ex-Post

	in percent
buyer was unable or unwilling to pay	16.7
seller wanted to be paid later	3.6
not applicable	76.2
other	1.8
missings	1.8
Total	100.0

Source: Survey of 165 barter deals among 55 Ukrainian firms in 1997

Table 8

Barter and Creditworthiness

	barter share in percent of output		
	mean	std. dev.	cases
debt in percent of output			
1. total debt*	43,67	27,7	138
0% - 10%	22,04	17,5	42
10% - 20%	56,28	23,5	30
20% - 690%	51,70	27,1	66
F = 25.374	sign. level 0.000		
2. bank debt	45,12	28,5	150
0%	48,63	32,0	63
1% - 5%	37,57	25,9	42
5% - 105%	47,27	24,6	45
F = 2.114	sign. level 0.124		
3. firm arrears	43,67	27,7	138
0% - 10%	32,13	25,4	60
10% - 20%	48,44	21,5	33
20% - 626%	55,57	28,9	45
F = 11.350	sign. level 0.000		
4. wage arrears	45,13	28,5	150
0%	37,63	29,8	75
1% - 10%	49,25	24,2	66
10% - 40%	77,33	17,8	9
F = 10.151	sign. level 0.000		
5. tax arrears	45,13	28,5	150
0%	39,84	21,1	87
1% - 10%	52,15	27,6	39
10% - 125%	52,88	28,5	24
F = 3.704	sign. level 0.027		

*except bank debt

Source: Survey of 165 barter deals among 55 Ukrainian firms in 1997

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