

MAY 24, 2000

NATURE OF BARTER:  
CASE OF UKRAINE

by

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A thesis submitted in partial fulfillment of  
the requirements for the degree of

Master of Arts in Economics

Kyiv-Mohyla Academy

2000

Approved by \_\_\_\_\_  
Chairperson of Supervisory Committee

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Ukrainian economy now has been experiencing a large-scale demonetization manifesting in the increasing portion of transactions held in non-monetary form. This paper investigates nature of barter in some transition economies in case of Ukraine. This paper stresses the time dimension: it is presumed that barter causes are changing through time. It is hypothesized that at the present stage barter is used as means to hide information to create information asymmetry under conditions of weak market institutions. To verify the hypothesis empirical data are examined. The dataset includes data on barter and financial indicators of the enterprises by regions and manufacturing industries. The results appear to support the hypothesis of barter being currently a strategic variable rather than depending on financial position of economic agents.

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## ACKNOWLEDGMENTS

I first wish to sincerely and especially thank my thesis advisor, Janusz Szyrmer who helped me consistently and constructively the entire way. Without his guidance and advice, this work could not be produced. I additionally thank Dr. Charles Steele for a number of directed and extremely productive talks and comments. I particularly thank Dr. David Snelbecker, Dr. Khwaja Sultan and Alexander Pivovarski for valuable comments and proofreading. I am very grateful to my senior colleagues from the HIID: Vladimir Dubrovski and Tamara Shygayeva for ideas and comments. My gratitude to Dr. Sergei Guriev, Dr. David Brown and Dr. Mark Schaffer for taking the time from their busy commitments and providing me with data and advice by e-mail. I would also like to thank Nikolaj Golovanenko for helping me with data processing. I am also very grateful to all my colleagues from the HIID. My special thanks go to my mother for moral support, patience and impeccable understanding.

## GLOSSARY

**Barter.** Direct exchange of goods and services without the use of money.

**Inter-enterprise arrears.** Overdue trade credit.

**Promissory note.** Written promise to pay a specified amount of money either on demand or at a fixed future date, with or without interest.

**Soft budget constraint.** A syndrome associated with the paternalistic role of the state towards economic organizations and private firms, non-profit institutions and households.

**Subsidy.** The financial support given by a government to specified businesses, groups, or individuals.

**Tax arrears.** Taxes that have been accrued and have come due but have not been paid.

**Trade credit.** Credit extended by one firm to another as part of sales and purchases of inputs and outputs.

**Institutions.** Relatively stable rules of human conduct that put costs on some actions and thus influence the way in which individuals evaluate various possibilities to act.

**Kartoteka-2.** Procedure, under which funds entering a bank account of an enterprise-debtor are automatically transferred to the creditors according to priority defined in the law.

**Veksel.** Promissory note used by enterprises and government to settle transactions.

## INTRODUCTION

Fifteen years ago, during the April Plenum of the Communist party, Soviet leader Michail Gorbachev announced the start of a new stage in the development of the Socialist system, the so-called perestroika. Few could have expected then that it would be the beginning of the end of the Soviet empire and the entire socialist system. The years following the Plenum saw dramatic changes both in political and economic life.

After obtaining independence, Ukraine started its long journey to a market-based economy. Being a part of the former Soviet Union, it inherited the old command-administrative system and all its positive and negative features. According to Fischer (1994, 1:237), each post-socialist country has to undertake a set of fast reforms, including price liberalization, trade liberalization (i.e. open the country for goods and capital flows), macroeconomic stabilization (including fighting hyperinflation) and privatization along with establishment of relevant market institutions. Unfortunately, Ukraine did not follow this path. After achieving a fragile macroeconomic stabilization with partially liberalized prices and, to larger extent, trade, implementation of the other components of the recipe seem to have been suspended: as time passed, reforms slowed down and as a result eventually more and more negative phenomena started to appear. One of the most remarkable and severe problems that have arisen in Ukraine during the transition is the prevalence of non-monetary payments in all spheres of economic activity (Hendley, Ickes and Ryterman (1998); Gaddy and Ickes (1998)). One can argue that it is common for post-socialist countries undergoing transformation to experience high-level demonetization. However, a striking fact is that transition of Central European countries was not characterized by a demonetized stage. Only countries established after the break-up of the Soviet Union (except for

Baltic countries) continue to see money surrogates driving out money from the economic activity following Gresham 's law.

Traditional economics suggest that barter and other non-monetary payments are inferior to money because of the need for double coincidence of wants, and related to that higher transaction costs. If barter and other non-monetary means are so costly, why do the enterprises then use them? This paper investigates the nature of barter and tries to find an answer to the question above. The objective of this paper is to find some evidence to shed more light on the underlying factors of non-monetary payments. Following Guriev and Ickes (1999) I perceive that factors initially causing demonetization may not be crucial for its further proliferation. My focus primarily is on the current situation. After detailed investigation of the literature and several interviews with people directly involved in the non-monetary schemes I can hypothesize that motivation for barter evolved through time. The question I try to answer is as follows: is current barter used to create information asymmetry given the weak market institutions. For empirical evidence the data on barter by oblasts and manufacturing industries were matched with the dataset including indicators from balance sheets, and financial and property statements. The results obtained seem to support the hypothesis of strategic employment of barter under weak market institutions. Empirical evidence shows that barter is not related to financial position of the enterprises. This allows further generalization of findings and developing policy recommendations. The question remains pressing and requires further research. Without becoming a civilized market economy with civilized ways of doing business, Ukraine will not be able to ensure economic growth and general welfare of its people.



Chapter 1 presents a brief literature review. Chapter 2 deals with theoretical aspects of barter and weak market institutions. Chapter 3 describes empirical evidence. Chapter 4 presents the concluding remarks. In the appendix, additional empirical evidence and statistics are presented.

## *Chapter 1*

### LITERATURE REVIEW

Existence of non-monetary payments in Ukraine and other CIS countries and their sharp increase after 1995 gave rise to the heated debate among both Ukrainian and foreign experts about the underlying causes of this phenomenon (Van Atta, Neubert and Plakhotnik (1998); Guriev and Ickes (1999); Shchur and Zhylyayev (1999)). Almost all international academic institutes dealing with economies in transition devoted part of their activity to studying such a complex issue.

First we present the extended classification of non-monetary payments introduced in Shchur and Zhylyayev (1999, p.4), then we consider the existing hypotheses called upon to explain barter persistence.

The non-monetary payments include the following categories of transactions:

- Direct exchange of goods or services
- Mutual cancellation of debts (debt offsets)
- Overdue arrears
- Money surrogates (veksels, interfirm and regional substitutes for money)
- Restructuring and writing off tax arrears
- Default/non-payments
- Debt-equity swaps
- Exchange of services due to corruption.

While all of the above operations imply final settlement of obligations, default can be considered an extreme case of non-monetary payments when in fact one of the parties in transaction does not fulfill its obligations in any form.

The wide range of hypotheses that can be formulated on this issue and conditionally divided into two main groups:

- The first group consists of those that explain non-monetary payments as the consequence of macro- and micro-imbalances in economy, such as hyperinflation, liquidity shortage, high credit rates, weak corporate governance;
- The second group consists of those that explain non-monetary payments as a means of strategic behavior, such as tax avoidance and rent-seeking

Initially, a majority of experts considered shortage of cash money and enterprise insolvency to be the main factor encouraging barter, seeing it as “a rational response by economic actors to a breakdown in the cash economy...”(Van Atta, Neubert and Plakhotnik, 1998, p.12).

Liquidity shortage can exist for several reasons. First, barter and veksels can be used as substitute for money since it is difficult to obtain commercial credits (Sweeney, 1998, p.1). This difficulty arises because of high credit rates and generally weak banking sector.

Another factor related to liquidity shortage is the large share of loss-making enterprises which survive only through state support. Gallagher (1997, p.1) concludes that barter results from the unwillingness of local governments to stop “keeping tired, old, inefficient enterprises going by setting up an elaborate bureaucracy to help bankrupt enterprises swap products they could never hope to sell...”.

This first group of hypotheses also covers “path-dependence” explanations of barter: systemic features inherited by CIS countries from the Soviet Union, including absence of enterprise culture to follow the rules (“to obey the law”) and prevalence of loss-making firms in the economy “on the edge of survival” combined with soft-budget constraint (Hendley, Ickes, and Ryterman, 1998, p.1; Guriev and Kvasov, 1999).

Closely related to the above hypotheses is the opinion that very often enterprises are caught in the “institutional trap of barter” (Guriev and Kvasov, 1999, Shchur and Zhylyayev, 1999). Thus, once enterprises get involved in barter schemes it is difficult for them to tear out the vicious circle.

A new generation of explanations constitute the second group of hypotheses. It associates barter with strategic behavior. Among them are the use of barter as a means for price discrimination (Guriev and Kvasov, 1999); economies of scale in the use of barter (Guriev and Ickes, 1999). The underlying factors for barter are also being explained for different types of enterprises: barter is used by loss-making enterprises to avoid restructuring, whereas viable enterprises see it as “an additional liquidity” source (Maurel and Brana, 1999).

Another popular explanation of non-monetary payments is that they are the reflection of the economy being virtual (not real) (Gaddy and Ickes (1998). They argue that

The Virtual Economy arises because of the combination of two fundamental facts: (1) most of the Russian economy (especially its manufacturing sector) is value-subtracting, while (2) most participants in the economy pretend that it is not. Barter, tax arrears, and other non-monetary modes of payments turn out to be the main mechanism used to sustain the pretense. The pretense is what causes all the nonpayment

difficulties. There is less value produced than there are claims on it and commitments to it” (p.4 )

Therefore, the economists have not reached agreement on explanations for the underlying factors that gave rise to non-monetary payments. Some authors (Hendley, Ickes, and Ryterman, 1998; Gaddy, Clifford G. and Ickes, Barry W., 1998) see the roots of the current situation in the socialist system left as legacy from the Soviet Union to the newly independent states. Other experts see the liquidity shortage as the main cause for barter (Maurel and Brana, 1999). Another group of economists believes that the disorganization of the Soviet system, which has established supply and distribution channels forced enterprises to use non-monetary payments (Dalia and Schnitzer, 1999). In this paper, I try to show that barter enabled by underdeveloped market institutions is used as a way to create information asymmetry.

The next section presents theoretical issues of barter.

## Chapter 2

### THEORETICAL BACKGROUND

According to definition (Fisher, Dornbusch and Schmalensee, 1990), barter is a direct exchange of resources and products that is highly inefficient because it requires a double-coincidence of wants and, therefore is very costly. However, the current wide usage of barter seems to refute the costs associated with such transactions in the countries with underdeveloped market economy. New Institutional Economics suggests that developing countries (including transition economies) innovate institutional substitutes for arrangements existing in the developed market economies (Stone, Levy and Paredes, 1996).

Thus barter, and non-monetary payments in general can be viewed as substitution for monetary arrangements. Money performs several functions in the economy: medium of exchange, store of value, accounting unit and means of deferred payments. Let's consider how the non-monetary payments were introduced to fulfill these functions.

*Medium of exchange.* Under barter schemes, there is no unique medium of exchange. Each good can act as a medium of exchange and substitute for money in transaction.

*Store of value.* In the course of hyperinflation, when value of money is quickly eroding, goods are used as a store of value.

*Unit of accounting.* This function is retained by money in theory, since all accounting records use cash prices to register transaction. However, in practice, very often cash prices are put arbitrarily and actual accounting is conducted in terms of goods to be exchanged, or currency of countries are used.

*Means of deferred payments.* Under barter schemes goods act as a collateral in an uncertain environment.

Now I turn to the types of barter transactions and possible hypotheses associated with each type suggested in the literature and my own perceptions. Obviously, the set of hypotheses is not claimed to be exhaustive and complete.

## **2.1. Barter classification and possible explanations.**

Barter transactions can be divided into 4 subcategories<sup>1</sup>:

- Barter transactions between enterprises.
- Barter transactions between enterprise and its employees
- Barter transactions between enterprise and government
- Intergovernmental barter transactions

### **2.1.1. Barter transactions between enterprises.**

*Liquidity shortage*

- Lack of credits due to a poorly developed banking system or very high interest rates. Lack of long-term credit and high interest rates make borrowing for enterprises more difficult (Maurel and Brana, 1999).
- Lack of working capital resulted from hyperinflation and tight monetary policy called to combat it (Auktsionek, 1997).
- Temporary enterprise insolvency due to lack of customers ability to pay or other factors (forced barter). There is a vicious circle where enterprises are not able to pay for goods purchased because they do not get payment for their output shipped to other enterprises, that in turn also cannot make

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<sup>1</sup> The classification of the barter transactions in this form is a result of extension of classification suggested by Van Atta, Neubert and Plakhotnik (1998) by the HIID team working on barter, including the author of the paper.

payment for the above output since they do not get payment from someone else (Auktsionek, 1997).

#### *Inflation*

- Inflation expectations lead to enterprises' unwillingness to hold currency thus stimulating barter.

#### *Tax issues*

- Existence of Kartoteka-2, which discourages the use of money (Antczak and Ivaschenko, 1997). While there is a legal procedure that allows the state to extract money from accounts of debtors once the money enter accounts, enterprise will try to avoid using cash and bank accounts in their transactions.
- Barter helps to evade taxes since it is easy to hide operations within non-transparent barter trade. Facing high tax burden enterprises try to avoid their payment using barter schemes (Maurel and Brana, 1999).
- Government (especially local governments) efforts to keep unprofitable enterprises afloat through creation bureaucracy to help the above enterprises swap products they could never hope to sell. They justify such intervention by saying that they cannot allow enterprises to close down since many employees will lose their jobs (Gaddy and Ickes, 1998a; Gallagher, 1997).

#### *Disorganization*

- Barter is used to maintain production when trading relations are destroyed as a result of disorganization (Marin and Schnitzer, 1999). In this case good exchange is used as collateral and thus helps to solve disorganization problems.

#### *Inefficient legal framework*



- Lack of effective bankruptcy procedure and impediments to its implementation, therefore hampering enterprise restructuring. Complexity of the use of bankruptcy procedures can be explained by two factors. First, many enterprises are potentially insolvent, and the bankruptcy of some could cause a chain of bankruptcies. Second, creditors do not expect to benefit financially from initiating bankruptcy actions. (Hendley, Ickes and Ryterman, 1998).
- Inefficient legal proceeding against debtors, i.e. lack of contract enforcement. Debtors do not pay debts realizing that cost of non-payment is lower since penalties are insignificant.

*Lack of control over the activity of enterprises by the shareholders*

- Payment of taxes in kind affords greater flexibility to managers. Managers hide transactions from outside owners, sometimes getting side payments for barter transactions (Gaddy and Ickes, 1998b).

*Low investment*

- With very low investment the enterprises are lacking real money to restructure or to expand production.

*Principal-agent problems*

- In case when ownership is separated from the management, enterprise managers use non-transparent barter schemes to divert profits.

**2.1.2. Barter transactions between enterprise and its employees**

- Temporary enterprise insolvency due to lack of customers ability to pay or other factors.

- Lack of effective bankruptcy procedure.

### ***2.1.3. Barter transactions between enterprise and government***

- Government inability to pay its bills for goods and services. Due to lack of budget funds or their misuse, government, especially, local governments, owes money to enterprises for goods and services provided. The above factors caused such form of barter transactions as tax offsets. Under this scheme, government writes off tax debts of enterprises in exchange for goods and services provided to government and budget organizations (World Bank, 1998).

### ***2.1.4. Intergovernmental barter transactions.***

- Many post-Soviet countries developed large intergovernmental barter arrangements in interstate trade making an attempt to provide subsidized energy and raw material inputs through them (World Bank (1996)).
- Unstable financial situation in the CIS countries and fluctuating exchange rate leads to the higher share of barter in foreign trade between these countries as compared to the rest of the world.

## **2.2. Barter and weak market institutions.**

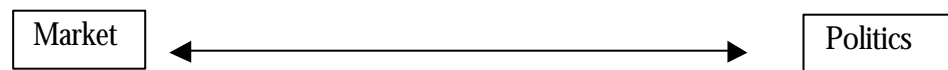
### ***2.2.1. Definition of market institutions***

According to Douglass North (1994), institutions are the constraints in the form of informal and formal rules constructed by individuals to structure their interaction. Institutions create an incentive structure of a society and determine economic performance.

Under market institutions, I mean a set of rules established for impersonal, unforced exchange of property rights to goods and services. Notion of market institutions is closely related to the term market economy. Economists define a set of criteria of a market economy, in particular:

1. Voluntary and free exchange of value between individuals and/or firms.
2. Freedom of economic activity.
3. Freedom to own and exchange both personal property and the means of the production.
4. Freedom of movement and information.
5. Free entry and exit.
6. Maintenance of competition as a function of legal and regulatory system.
7. Government role lies in maintaining market system through legislative base. (Sullivan, 1999)

Opposite to the Market in terms of allocation of resources is Politics. In the former resources are allocated freely through interaction of agents, whereas in the latter resources are allocated through a command system. The weaker the Market, the stronger the Politics, and vice versa. Schematically we can show this as follows.



Subjects (countries, regions within one country, industries within one country) can be located on the line depending on their closeness to one of the allocation system.

Now I turn to the specific hypothesis, which is based on previous research and my investigation.

### **2.2.2. Null hypothesis**

I hypothesize that barter is a way to hide information (create information asymmetry) under conditions of weak market institutions.

Barter = f (Underdeveloped or weak market institutions)

I assume that barter in its development evolved from being a means to avoid dealing with money to being a strategic means to hide information with the purpose to earn additional income. Thus, two stages of barter existence can be distinguished. Beginning of the first stage coincides with the period of hyperinflation during which value of money was eroded. (See data on CPI below)

	1993	1994	1995	1996	1997	1998
CPI (Dec.toDec.)	102.6	5.0	2.8	1.4	1.1	1.2

When prices were changing every day and the value of contracts in monetary terms was shrinking, enterprises found the way to avoid using monetary means in their transactions. Gradually, to this factor other factors stimulating barter started to appear. For example, in 1995 prices for oil and oil products were liberalized. This led to drying out of working capital of enterprises which primarily used obsolete energy intensive technologies in their production processes. Another example is introduction of Kartoteka-2 in 1996, the issue discussed below in more details. At the same time, the process of learning by doing by enterprise managers was taking place. Thus, I turn to the second stage of barter evolution when barter is no longer strongly associated with financial problems and is very often used voluntarily to pursue specific interests. Barter is a very non-transparent procedure under which prices can be set arbitrarily in terms of goods it. Initially barter transactions were on bilateral basis and were illustration of conventional notion of barter as direct exchange of goods with significant transaction costs related to the need for double coincidence of wants. However, as time passed barter schemes have become increasingly complex with the rising number of participants. Transactions costs of barter have been falling due to economies of scale (Guriev and Kvasov, 1999) and emergence of financial intermediaries specializing in this type of activities. Barter stopped to be something that enterprises were forced to do and became a subject of choice. Therefore, the purpose of its use has also changed. Managers discovered that barter is a very

convenient way to hide information (exacerbating information asymmetry) from tax authorities (barter as means of tax avoidance), owners (principal-agent problem), workers. Persistence of barter at such volume could not be possible in strong market economy, since the games of the rules exist under assumption that firms are profit-maximizers, whereas under weak market institutions it is the rent that is maximized rather than profit. It is non-transparency that makes barter attractive for managers. Now it is time to consider current environment in the context of weakness of market institutions.

### ***2.2.2. Aspects of weak market institutions.***

In this subsection I briefly review the factors that could be included in the notion of underdeveloped or weak market.

- Existence of non-market-based regulations (Kartoteka-2).

Artificial, non-market by nature regulations put constraints on the economic activity of business agents and distort the choice variables of them. Firms often engage in activities to divert cash from their transaction accounts. Thus they use non-monetary payments, in particular barter and veksels to create non-transparency under which they easily can hide any earned profits (Antczak and Ivashchenko, 1997).

- Existence of market power

Barter can also be used as an instrument to price discriminate (Guriev and Kvasov, 1999). Very often monopolistic position in the market is associated with political power. Large enterprises can influence local authorities decisions by speculating on the employment issues. Non-transparency arising from the non-monetary payments facilitates this process.

- Poor bankruptcy procedure and weak corporate governance.

Inefficient bankruptcy legislation allows a large number of loss-making enterprises to continue to exist, which becomes a burden on the healthier and more prospective entities. In some cases, viable enterprises are forced to employ barter or other non-monetary payments.

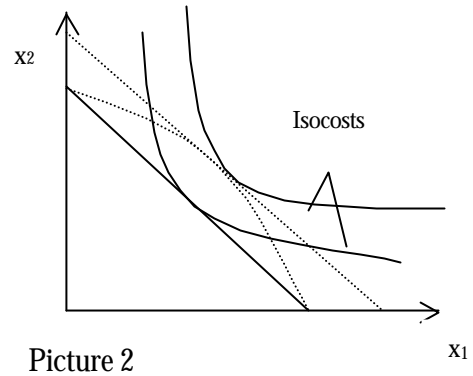
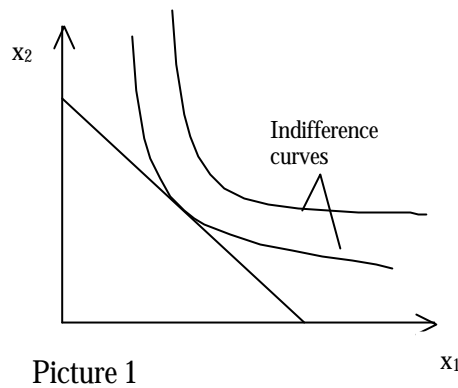
- Poorly defined property rights and poor contract enforcement.

Goods are often used as collateral in transactions to avoid uncertainty related to frequent non-fulfillment obligations under contracts.

- Soft budget constraint

The concept of the soft budget constraint was first introduced by Janos Kornai (1992). The words “budget constraint” are taken from the theory of households’ behavior. The households being constrained in their incomes have to make choice between bundles of goods (two goods in the simplest model, see Picture 1).

Kornai extends this concept to the theory of firm: in the market economies firms are constrained in terms of capital and inputs. Of course, they can borrow but not for free. Under socialism firms’ budget constraint was soft in a sense that enterprises could bailed out by the government almost any time they needed. Thus budget constraint line becomes either concave or shifts outward (Picture 2).



Thus, enterprises get preferential treatment from the government and are allowed to work inefficiently, incurring losses.

- Underdeveloped banking and financial sector

Liquidity constrained enterprises very rarely apply to the banking sector for loans.

Two controversial reasons are suggested:

- (1) high interest rates (Maurel and Brana, 1999).
- (2) enterprises' unwillingness to deal with banking sector, since non-monetary payments allow greater flexibility to manager in hiding profits (Gaddy and Ickes, 1998b).

The first factor is clearly related to the weakness of the banking sector that sets high interest rates to compensate for uncertainty and risk associated with loans provision in an unstable environment, while the other is an indicator of principal-agent problem.

Empirical evidence on the weakness of market is presented in Appendix.

Next section looks at the hypotheses of barter existence--liquidity shortage hypothesis and hypothesis that barter is used as collateral--which I use as alternative to my main hypothesis.

### **2.3. Alternative hypotheses**

From the variety of the hypotheses suggested in the literature and verified by other authors I choose the following two to be alternative to the hypothesis of barter being strategically used. These hypotheses represent the first group of hypotheses (macroeconomic and microeconomic imbalances—forced barter), thus they can be seen as opposite to the explanation of “voluntary” barter.

#### **2.2.1. Liquidity shortage**

Some authors (Commander and Mumseen, 1998; Maurel and Brana, 1999) see liquidity shortage as the main cause for barter flourishing. They support this argument with data of various surveys of managers of enterprises, in which lack of liquidity is stated as the most common reason for barter. For example, survey of Russian enterprises conducted by “Russian Economic Barometer” show that 47% of enterprise managers name lack of working capital as the main reason for usage barter (Auktsionek, 1997). In the survey of 165 barter deals among 55 Ukrainian firms performed in 1997 87,5% of managers rate lack of cash as the most important motivation factor for barter (Marin, Kaufmann and Gorochowskij, 1998). Investigation of recent EBRD survey of enterprises in transition economies also reveals strong positive relationship between financial problems of enterprises ranked by managers and barter volume (Carlin, Fries, Schaffer, Seabright, 1999). Limited access to credits by enterprises which leads to credit squeeze is also viewed as the cause for barter (Commander and Mumseen). Insolvency of the trading partner and own liquidity problems dominate answers of the managers survey conducted in October/November 1998 in Russia. Temporarily liquidity shortage may cause viable enterprises to use barter as substitute for short-term credit while non-viable firms use barter to avoid restructuring (Maurel and Brana, 1999).



### ***2.2.2. Collateral hypothesis***

Collateral hypothesis is closely related to the notion of disorganization applied to the situation in the countries of the former Soviet Union which arose as a result of dismantling of the central planing (Blanchard and Kremer, 1997). Disorganization implies break of production and trading relations among various economic agents which led to pronounced decline in output. In this context barter is used as collateral of trade credit under conditions of uncertainty in creditworthiness of partners (Marin and Schnitzer, 1999). It helps enterprises to maintain production when production process is complex, thus it is viewed as “mechanism of smoothening the transition from the “old” to the “new” regime” (ibid.).

In the next chapter I examine empirical evidence to verify my hypothesis and reject alternative ones.

## *Chapter 3*

### EMPIRICAL EVIDENCE

In this section, I first describe data and methodology and results of verification of my hypothesis and rejection of alternative hypotheses.

#### **3.1. Data and methodology**

For main analysis, two 1998 datasets were used (source: State Statistics Committee). The first dataset includes data on barter and consists of 2060 observations. The data have regional and industrial division: 27 regions (25 oblasts and city of Kyiv and city of Sevastopil) which in turn are divided by manufacturing industries. The categories of manufacturing industries for each region varies from 44 (for Sevastopil) to 91 (for Kharkiv region). In regional cut, the lowest share of barter was registered in Kyiv (10.3% of total sales) and the largest was in Rivno oblast (64.3%). For entire Ukraine tyre industry has the lead in barter transactions (89.3% of total sales) while tobacco industry was the least engaged in barter trade (1.44%).

The second dataset covers data from mandatory reporting submitted by enterprises to the regional branches of the State Statistics Committee. These reporting forms include balance sheets, financial statements and property statements. While this dataset has the same subdivision by regions and category of manufacturing industries, the number of observations is smaller since it covers only the basic manufacturing industries.

After matching the two datasets, I ended up with a new dataset of the same

structure with 465 observations. Summary statistics of barter variable as proportion of total sales is presented below (in percentage terms).

	Mean	Minimum	Maximum	Std. Dev.
Barter	38.20	0.00	98.22	26.05

In my research I employ the following statistical methods:

- Correlation analysis
  - Correlation matrix
  - Scattegram
- Analysis of descriptive statistics

### **3.2. Verification of null hypothesis: results and discussion**

Hypotheses that assume effect of institutions are difficult to verify with conventional statistical methods due to difficulties in constructing proxy variables.

As mentioned above barter trade implies double coincidence of wants (not necessarily double when more than two parties are involved in transaction). However, in this case I assume not those wants related to the characteristics of the goods but interests related to “benefits” associated with this type of transactions. Thus, if one of the sides of the deal is not interested in these “benefits”, barter is not used or used at much smaller scale only when party is forced. Therefore, I have to find such party among economic agents present in the economy. The most relevant agent from this point of view can be a household as a final consumer. Household does not have special interests in hiding information since it does not keep accounting books in the way the firms do and it cannot use barter to avoid taxes. There is no principal-agent problem either.

Thus, I need several assumptions about a household:

- (1) utility maximizer;
- (2) has no need for financial reporting;
- (3) is principal and agent in one face.

To verify this empirically I use consumer good index (CGI) as indicator of industry closeness to the final consumer which is not “interested” in using barter to create information asymmetry. Consumer good index was first employed by Guriev and Kvasov (1999) to investigate hypothesis of barter being a means for price discrimination.

CGI equals =1 when industry producers consumer goods  
 =0 when industry produces intermediate goods.

BARTER - barter share in total sales (%)

I employ correlation analysis, the results of which are presented in table below (The list of industries with respective indices is presented in Appendix).

	BARTER	CGI
BARTER	1	
CGI	-0.561	1

Data reveals strong negative correlation between barter and consumer good index, supporting my hypothesis that barter is used to hide information to get some specific “benefits”.

Since barter is a manifestation of deep institutional factors it is not expected to correlate much with standard economic variables. To validate this proposition a correlation matrix covering around 200 variables characterizing financial position of enterprises is constructed. The results show that barter does not significantly correlate with any other variable. Since standard economic variables (official data on financial and property position) cannot explain variation in barter, this

evidence also can give support to my hypothesis that barter has something to do with factors that cannot be explicitly measured.

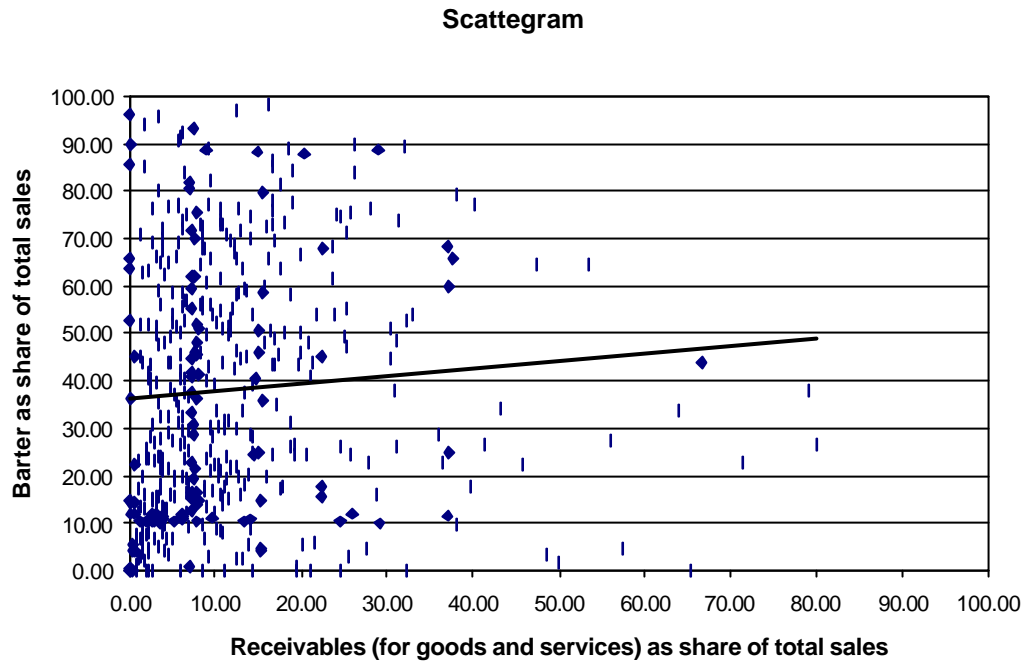
Obviously, this evidence is not sufficient to strongly verify the hypothesis, since it can be due to the poor quality of data; therefore, further research is needed. However, this issue can be partially solved if alternative hypotheses are rejected.

### **3.3. Rejection of alternative hypotheses: results and discussion**

#### ***Liquidity constraint***

As mentioned above, liquidity constraint is often named by enterprise managers and high government officials as the main reason for engagement in barter. Since the main source of liquidity for enterprises is payments from the trading partners, I expect that industries and regions which have large overdue receivables would be forced to use more barter schemes due to liquidity shortage. Thus in order for this hypothesis to be valid there should be a strong positive relationship between receivables and barter. However, data show (Scattegram 1) very weak relationship between them. The positive slope of the trend line is achieved due to the presence of several outliers.

**Figure 1.** Relationship between overdue receivables and barter proportion of total sales



Another support for rejection of the alternative hypothesis of lack of liquidity can be found in the Table 1, which contains data on correlation coefficient of several variables, characterizing healthiness of the region/industry, barter and bank credits (both long-run and short-run):

<b>Indicator</b>	<b>Abbreviation</b>
Barter as share of total sales	Barter
Cash. Accounts.	Cash
Profits of the reporting period	Profit
Short-term bank credits and other loans.	Credit_ST
Long-term bank credits and other loans	Credit_LT
Overdue payables to the budget.	Payables_B
Losses of previous years.	Past_loss

**Table 1** Correlation matrix

	Barter	Cash	Profit	Credit_ST	Credit_LT	Payables_B	Past_loss
Barter	1.000						
Cash	-0.312	1.000					
Profit	-0.228	0.164	1.000				
Credit_ST	-0.116	-0.061	-0.126	1.000			
Credit_LT	0.137	-0.049	-0.151	-0.009	1.000		
Payables_B	0.471	-0.183	-0.106	0.009	0.312	1.000	
Past_loss	0.219	-0.134	-0.116	0.016	0.130	0.186	1.000

Though barter is significantly negatively correlated to cash on account it cannot be evidence of liquidity constraint since cash on accounts constitutes only tiny amounts .For comparability I normalize it by dividing by total sales and multiplying by 100 (data are in percentage terms).

	Mean	Minimum	Maximum	Std. Dev.
Cash on accounts	0.45	0.00	6.25	0.71

Average enterprise cash on accounts is approximately 0.45 percentage of total sales. In this sense, all enterprises face the liquidity problems. However, this phenomenon can have another explanation, which is presented in the Appendix when discussing weakness of market institutions.

However, the most impressive is the fact that both short-term and long-term credits are positively correlated with payables to the budget and past losses which can be indicators of unhealthiness of the particular entity.

For simplicity the following table is constructed:

**Table 2.** Direction of relationship between selected variables

	Barter	Credit_ST	Credit_LT
Cash	-	-	-
Profit	-	-	-
Payables to the budget	+	+	+
Past losses	+	+	+

Therefore, credits are extended to enterprises which are unhealthy from the market point of view: they incurred losses in the past and they are debtors to the budget. In addition, there is positive correlation between barter and long-term credits that also points out that entities which use barter more get more credits and are even less constrained in terms of liquidity than others that have less credits and less barter, respectively. Hence, provision of liquidity cannot help to solve problem of non-monetary payments.

### ***Collateral hypothesis***

If barter is used as collateral in trade credits one should expect that enterprises which heavily use barter have less overdue receivables, since in this case using barter implies less uncertainty and less risk of non-payments for goods and services (negative correlation). Therefore, I once more refer to the finding on the relationship between overdue receivables and percentage of barter operations in total sales (See scattegram above). The present relationship is not only weak but is opposite to the expected relationship. This allows to cast doubt on the proposed hypothesis of using barter as collateral to maintain production.



## *Chapter 4*

### CONCLUDING REMARKS

The conducted research shows that such complex phenomenon as barter cannot be simply explained by financial troubles that enterprises face. Being initially forced to shift from monetary transactions enterprises through learning by doing have realized that non-monetary transactions, and barter in particular, due to their non-transparency can be easily used to hide information and extract rent. Thus, motivation for use of barter has changed over time. The empirical results seem to support the proposition that at the present stage barter is used as a means to increase information asymmetry. On the contrary, the alternative hypotheses, which represent group of hypotheses of forced barter, seem not to find empirical support at the present stage. However, this research suggests direction for further investigation and cannot obviously give an exhaustive answer to the question why economic agents in the countries of the former Soviet Union use inefficient--from the conventional wisdom point of view--non-monetary means. Researchers investigating the issue of demonetization should take into account time dimension since processes in the economy (especially in transition) are dynamic by nature; hence, factors that gave rise to the non-monetary transactions may not be the same as factors that explain their persistence.

What are the possible policy recommendations? Since presence of barter along with other non-transparent transactions is enabled by weak market institutions, the policy objective is strengthening of the market and abandoning old Soviet-type methods of regulation of economic activity.

The aim of the decision-makers should not be at barter itself (or other non-monetary transactions) but rather on the fundamental institutional roots of this phenomenon. Solution of barter problem does not lie in provision of more liquidity in the form of money emission or cheap credits or imposition of ban on this type of transactions but rather in implementation of fundamental institutional reforms to strengthen the market. Though recently the share of barter in total sales has fallen significantly from around 40% in 1998 to 18% in the first quarter of 2000. At the same time, as data show the share of cash in total sales increased only slightly or even fell in some manufacturing industries (e.g. gas industry). Hence, barter is evidently substituted with other non-transparent procedures leaving the problem of demonetization open.

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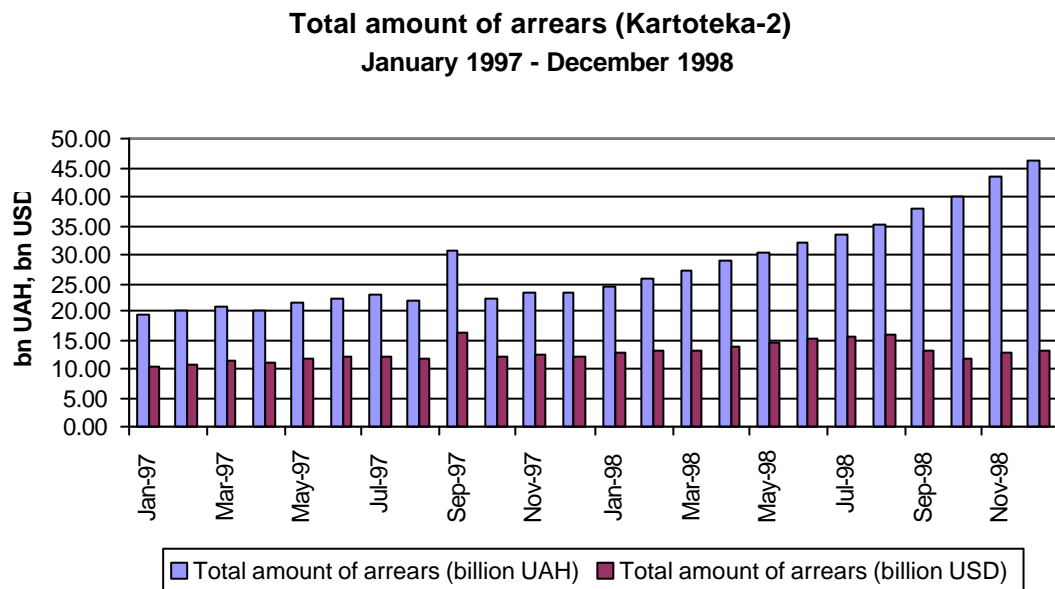
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## APPENDIX

### A.1. Empirical Evidence for weak market institutions

#### A.1.1. Kartoteka-2

Figure 1A

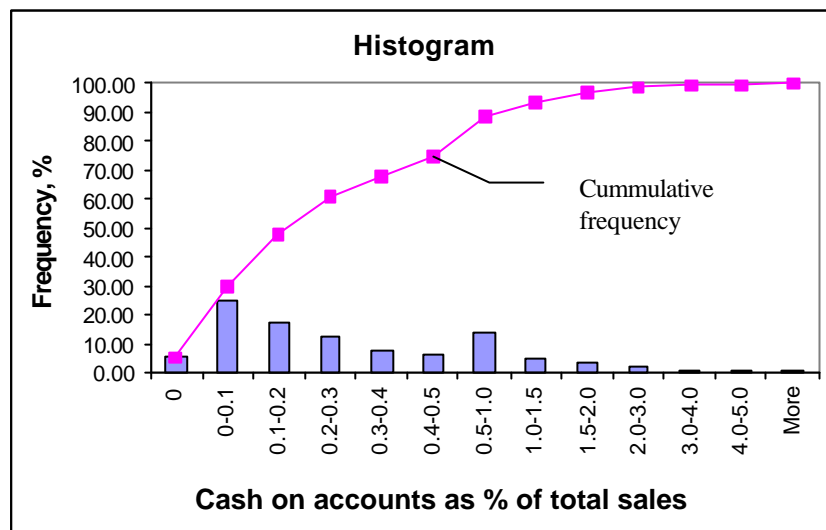


Source: NBU

As can be seen from the chart total amount of debts of enterprises on Kartoteka-2 had been permanently increasing in hryvnia terms. Slight decrease in amount of debts in dollar terms (using official exchange rate) September-October 1998 is caused by significant hryvnia devaluation during this period, therefore, hryvnia value of debts was eroded. On average around 130 thousand enterprises were on Kartoteka-2 during the period from the beginning of 1997 to the beginning of 1999.

Another factor related to existence of Kartoteka-2 is a tiny amount of cash on bank accounts of enterprises.

**Figure 2A**



As data suggest enterprises avoid using bank accounts for transactions: average amount of cash on accounts as % of total sales equals 0.45%, maximum is only 6.25%. Histogram shows that the largest portion of enterprises has cash on accounts in the amount smaller than 0.5% of total annual sales (74.4%).

### **A.1.2. Market power**

Market power can be measured by a several indicators.

Measure of market structure:

- 1) Industry concentration;
  - Concentration ratio, usually C4 and C8
  - Herfindahl-Hirschman index, HHI, which equals the sum of squared market shares of each firm in the industry (best applicable if small-

medium number of firms)  $HHI = \sum_i s_i^2$ , where  $s_i$  – share of firm in total output

2) Barriers to entry

- Minimum efficient firm size
- Advertising intensity
- Capital intensity

3) Unionization

4) Lerner index of market power (price-cost margin)  $\frac{P - MC}{P} = -\frac{1}{e}$

Research conducted in Russia (Guriev and Kvasov, 1999) shows that barter and market power measured by C4 are positively correlated. Macro nature of dataset does not allow me to perform similar investigation for Ukraine. However, other evidence suggest that in Ukraine barter does not seem to be related to market power (Carlin, Fries, Schaffer and Seabright (1999b)). Therefore, this aspect requires further research at the microlevel.

### ***A.1.3 Poor bankruptcy procedure and weak corporate governance***

One of the indicators of the development and performance of the economic system is proportion of loss-making enterprises (LME) in the total number of enterprises in a specific oblast and specific industry. As data show this proportion varies across regions and industries.

	Mean	Minimum	Maximum	Std. Dev.
Number of LME in total number of enterprises	51.42	0.00	100.00	26.38

On average 50 percent out of all enterprises in a region/industry incur losses. Proportion of LME in total number of enterprises is significantly positively correlated with barter share in total sales: the larger this proportion the larger



volume of barter as percentage of total sales is observed in a particular region and industry (correlation coefficient is 0.366).

**A.1.4. Poorly defined property rights and poor contract enforcement**

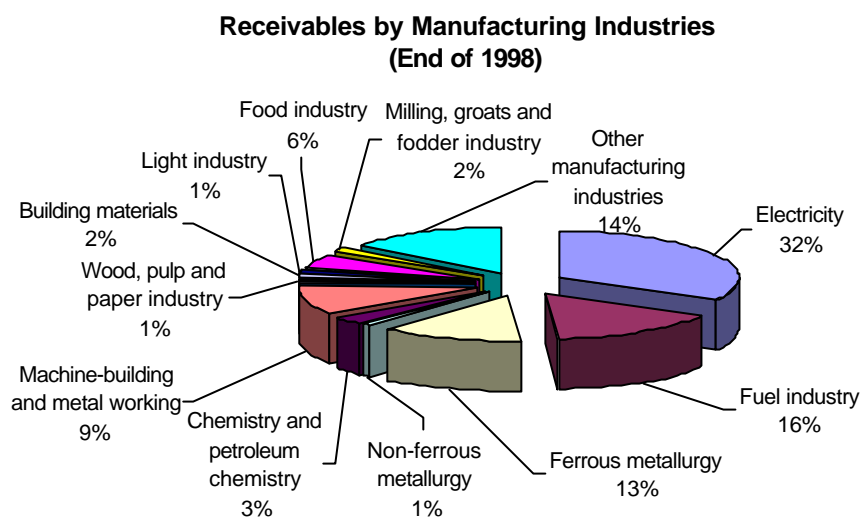
Interenterprise arrears can be an evidence of poor contract enforcement. At the end of 1998 total amount of overdue payables of among enterprises in entire economy amounted to 104,134.9 billion UAH, and in manufacturing 51,830.6 billion UAH, respectively. Barter appears to be positively correlated with overdue payables, including arrears related to payments for goods and services (correlation coefficient 0.214), payments to the budget (0.249) and wage arrears, especially (0.471).

	Barter	Overdue payables for goods and services	Overdue payables to the budget	Wage arrears
Barter	1.000			
Overdue payables for goods and services	0.214	1.000		
Overdue payables to the budget	0.249	0.319	1.000	
Wage arrears	0.471	0.387	0.483	1.000

**A.1.5. Soft budget constraint**

Soft budget constraint manifests in accumulating overdue payables to the budget. By the end of 1998 it exceeded 6 billion UAH. Allowing not paying to the budget, the state provides thus provides implicit subsidies to the enterprises.

**Figure 3A**



Another indicator could be volume of receivables of energy sector. Very often enterprises do not pay for energy supplied; thus they get implicit subsidies in the form of arrears.

***A.1.6 Underdeveloped/weak banking and financial sector***

Importance of financial and banking sector in the market economy is widely accepted. The Ukraine's banking system is considered one of the weakest among transition economies (Sultan and Mishev, 1999). It consists of more than 200 banks, however, total amount of bank capital in the banking system amounts only to 5% of GDP (end of 1998), while for other transition economies in Europe this indicator reaches 40.0% (average for the group). Total credit portfolio of Ukrainian banking system (end of 1998) adds up to around 10% of Ukrainian GDP, not to mention the quality of this portfolio, 30% of which accounts for bad credits. Deposits at the banks total to 8% of GDP. Ukrainian banks are required to extend credits to specific enterprises at

the government request. Under these conditions, Ukrainian banking system cannot perform its role of assets transformation and channeling resources to their most efficient use.

**A.2. The list of industries with respective barter shares and consumer good indices**

	<b>Barter</b>	<b>CGI</b>
Mining	49.40	0
Processing	41.24	0
<b>Energy</b>	<b>47.90</b>	0
<b>Fuel industry</b>	<b>57.85</b>	0
Oil recovering	58.65	0
Oil refining	72.05	0
Gas industry	38.39	0
Coal mining	58.63	0
<b>Nuclear plants</b>	<b>28.78</b>	0
<b>Ferrous metallurgy</b>	<b>40.80</b>	0
Extraction and ore dressing for ferrous metallurgy	56.78	0
Ferrous metal production	35.26	0
<b>Non-ferrous metallurgy</b>	<b>20.24</b>	0
Chemistry and petroleum chemistry (including chemical-pharmaceutical industry)	46.16	0
<b>Chemistry and petroleum chemistry (excluding chemical-pharmaceutical industry)</b>	<b>49.28</b>	0
Chemistry	37.43	0
Basic chemistry	36.29	0
Plastic and fiberglass industry	27.32	1
Lacquer and dye industry	53.91	0
Petroleum chemistry	79.48	0
Tire industry	89.32	0
Rubber and asbestos industry	61.60	0
Machine-building and metal working, including medical equipment	42.86	0
<b>Machine-building and metal working, excluding medical equipment</b>	<b>42.86</b>	0
Machine-building	41.96	0
Metallurgy machine-building	33.13	0
Mining machine-building	71.26	0
Railroad machine-building	47.77	0
Electric machine-building	55.11	0
Chemical and petroleum machine-building	39.28	0
Machine-tool industry	56.62	0
Equipment industry	32.93	0

Car industry	36.56	1
Tractor and agricultural machine-building	71.28	0
Road and utility machine-building	56.75	0
Machine-building for light and food industry	37.55	0
Light industry equipment	49.96	0
Technological equipment for chemical fiber production	35.99	0
Technological equipment for food and fodder industry	38.48	0
Home appliance industry	36.26	1
Sanitary and gas equipment	62.55	0
Aircraft	11.91	1
Shipbuilding	2.80	1
Metal construction and equipment	49.02	0
Machine and equipment repairing	48.57	0
<b>Wood working, paper and pulp industry</b>	<b>48.60</b>	0
Wood working	53.06	0
Wood building materials and slab production	73.43	0
Furniture industry	54.02	1
Paper and pulp industry	43.64	1
<b>Building materials</b>	<b>65.83</b>	0
Cement industry	82.45	0
Iron and concrete construction and equipment (excluding wall materials)	70.37	0
Wall materials	66.56	0
Non-ore building materials	47.41	0
Glass and china industry (including medical equipment)	61.32	0
<b>Glass and chine industry (excluding medical equipment)</b>	<b>65.82</b>	0
Glass industry	62.80	0
China industry	76.14	1
<b>Light industry</b>	<b>39.99</b>	1
Textiles	59.91	1
Cotton industry	67.06	0
Wool industry	53.65	0
Silk industry	70.89	0
Knitwear industry	50.63	1
Sewing industry	18.37	1
Leather, fur and footwear industry	40.12	1

Genuine leather production	31.72	0
Artificial leather production	54.89	0
Leather and notions industry	38.45	1
Fur industry	21.07	1
Footwear industry (excluding rubber footwear)	58.34	1
<b>Food industry</b>	<b>24.75</b>	1
<b>Food and flavor industry</b>	24.53	1
Sugar industry	77.89	0
Bakery	4.13	1
Confectionery	18.02	1
Butter and oil industry	22.01	1
Alcohol industry	12.28	1
Liqueur and cognac industry	8.30	1
Wine industry	23.42	1
Brewery	6.21	1
Non-alcoholic production	7.65	1
Fruit and vegetable industry	53.48	1
Tobacco industry	1.44	1
Meat and dairy	24.83	1
Meat industry	9.80	1
Dairy industry	37.71	1
Fishery	77.14	1
<b>Microbiology</b>	<b>11.29</b>	0
<b>Milling, groats and fodder industry</b>	<b>20.04</b>	1
Milling, groats industry	20.87	1
Milling	20.26	1
Groats industry	26.11	1
Fodder industry	16.96	1
<b>Medical industry</b>	<b>19.67</b>	1
Chemical and pharmaceutical industry	18.52	1
Medical equipment	43.31	0
Glass, china and plastic medical equipment	26.63	0
<b>Printing</b>	<b>6.93</b>	1

Note: Basis industries are in bold

