Unregistered International Trade under Different Statistical Approaches

Nierejestrowany handel międzynarodowy w świetle różnych sposobów statystycznego podejścia do problemu

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Abstract

This paper considers unregistered international trade along the eastern border of Poland. On this basis, we present difficulties in defining the parallel economy. We present a number of possibilities of assessing the unregistered trade volume by indirect information such as passenger transport and the number of trade-related offences, although such forms of research do not give full information about volume of unregistered trade and its significance for the Polish economy. Three statistical approaches to the problem of measuring the scale of unregistered trade are also anałyzed. The first one is a questionnaire survey based on a random stratified sample of adult citizens of Poland. The second one is a direct survey of the country's open-air markets. The third approach is a study based on information from the Police Department about arrested traffickers and the goods they have passed through the border.

Keywords: unofficial economy, international trade, methods of statistical approach

JEL: C0, F1, F2, K4

Streszczenie

W artykule autorki zbadały nierejestrowany handel prowadzony wzdłuż wschodniej granicy Polski. Na tym przykładzie pokazały problemy definicyjne dotyczące gospodarki nieoficjalnej. Przedstawiły sposoby szacowania wielkości takiego handlu na podstawie informacji o rozmiarach transportu osobowego i liczby wykroczeń związanych z handlem, choć zdają sobie sprawę, że nie uzyskują w ten sposób pełnej informacji na temat badanego zagadnienia. Następnie omówiły trzy sposoby statystycznego podejścia do problemu. Pierwszy stanowi ankietowanie losowej próby warstwowej dorosłych obywateli Polski. Drugi jest bezpośrednim, częściowym badaniem bazarów. Trzeci stanowi analizę opartą na policyjnych danych o aresztowanych handlarzach i zarekwirowanych towarach.

Słowa kluczowe: gospodarka nieoficjalna, handel międzynarodowy, metody badań statystycznych

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The existence of the unofficial economy is a fact. However, it is difficult to define this sector of the national economy. Moreover, there are some controversies concerning, among others, the assessment of its size. Other disputes refer to the scope of this kind of economic activity. Terminology is another problem. There are different, interchangeably used terms, e.g. unofficial, informal, grey, black, underground, unregistered, parallel or hidden economy. Below, all these terms are treated as synonymous by the authors of the paper.

The paper consists of five main parts. We start our presentation with identifying different definitions of the unofficial economy. It is followed by a description of the effects of the underground economy. Next, we focus on one form of unofficial activities, namely illegal trade in cigarettes and vodka smuggled through the eastern border of Poland. We have chosen this aspect of the grey market because we consider it to be important for the Polish economy. Illegal trade in cigarettes and vodka is traditionally vital not only for the eastern part of Poland but also for the whole country. On the other hand, this problem is important because since May 2004 the Polish eastern border has become an EU border. The additional reason for our interest in the issue is scarcity of analytical work on this area. On the basis of illegal trade in cigarettes and vodka smuggled through the eastern border of Poland, we discuss difficulties in assessing the volume of that trade. In the next two parts we also describe in detail some indirect methods of the assessment of the volume of the trade as well as some basic methods of direct surveys. We present possibilities of using the three statistical approaches to measure illegal trade with Eastern Europe.

1. Defining the unofficial economy

Commonly used definitions of unofficial economic activity can be divided into two groups. The first one contains narrow definitions. According to this approach, the grey economy consists of economic activities that are neither disclosed (for various reasons) nor controlled by the state (although they should be). The narrow definitions treat all unregistered economic activities that influence the size of officially calculated GDP as part of the unofficial economy. The examples include illegal trade in arms, cigarettes, alcoholic beverages and private undeclared transactions. The reason why such activities exist is usually economic calculation. In this approach, the parallel economy does not include activities benefiting society and based on non-market rules (e.g. work in own or neighbour's household) – see Feige (1989) and Flodman-Becker (2004, p. 11). The narrow approach is represented e.g. by Smith (1985, p. 18), according to whom the parallel economy consists of legal and illegal production of goods (services) based on market rules and not directly included in the official estimates of GDP. However, it is worth noting that these activities, albeit non-observed, are accounted for by some indirect measures.

The second group contains broad definitions. According to them the unofficial economy covers all areas and kinds of economic activities that remain outside the scope of registry and control of state authorities. These are both legal activities (e.g. work in own household, neighbours' assistance, volunteer work for organizations, religious communities and political parties), semi-legal activities (e.g. legal production of goods from illegally obtained raw materials) and illegal actions (e.g. drug trafficking). In this context, the parallel economy consists of both market-driven activities (i.e. profit-oriented activities) and those that are based on other objectives (e.g. sentiment ties, sense of obligation).

As far as the newest Polish literature is concerned, Mróz (2002, p. 23) refers to the broad definitions of the unofficial economy. He argues that this sector consists of unregistered activities aimed at deriving benefits in either monetary or natural forms and creating new values or causing redistribution effects. It includes both self-provision of household-related activities such as hidden employment (and production), and illegal production of goods and services. The first element of the unofficial economy (self-provision of household-related services, also referred to as natural consumption) comprises production of goods and services by individuals themselves in order to satisfy their personal needs. It is usually not based on economic calculation. In the long run, it is becoming less significant (Mróz 2002, p. 26). In our opinion, the reason is, e.g. the willingness to make the most of own competitive advantages in the legal sector and occupational specialization. In the case of the second component (hidden employment or production), legal goods and services are produced but this fact is not disclosed to the authorities. The reason is usually the intention to evade paying taxes and avoid social insurance payments, as well as some regulations and duties accompanying legal employment (e.g. the minimum wage, legally capped number of working hours, safety, technical and sanitary rules). This segment consists both of hidden production of unregistered units (entities or individuals avoiding their financial liabilities towards the state, e.g. tailors, tutors, other craftsmen and economic entities that have emerged in Poland relatively recently, along the transition – small

tradesmen, manufacturers of clothes and shoes (GUS 1995, p. 13) and hidden production of registered manufacturers who only partially avoid taxes and other liabilities towards the state. In the latter case, hidden incomes are obtained first via underestimated revenues and overstated costs and, consequently, lowered tax liabilities, and secondly due to illegal employment. In this context, the third segment of the unofficial economy is illegal production and distribution of goods and services. It includes running a business by unauthorized or unqualified persons. These concern not only drugs or adult movies, but also stolen items. A large part of this type of activities is a result of criminal activities (e.g. smuggling, piracy).

Some researchers resist incorporating criminal activities into the unofficial economy. It also means that they are against the broader definitions of the unofficial economy. They argue that criminal activity (e.g. production and distribution of narcotic drugs, money laundering, corruption) should be left outside the scope of the unofficial economy as socially undesirable and not welfare improving. It is not, however, a common opinion (see Simon, Witte (1982) and Schmidt (1982)).

Another problem is that it is sometimes difficult to accurately distinguish between legal, hidden and illegal production. Generally speaking, according to Mróz (2002, p. 153) as well as Flodman-Becker (2004, p. 11) the typical activity in an unofficial sector is usually characterized by: small-scale production, a small number of employees, labour-intensive methods of production, a smaller extent of functional specialization than in an official sector, a low volume of subcontracted services and additional transaction costs related to unregistered activities.

Statistical offices use their own definitions, as they consider these created by researchers too general and not precise enough. The System of National Accounts (SNA-93) includes its own definition of the unofficial economy that is widely used when estimating national accounts. It recommends including into the term "production" all manufacturing activities no matter whether they are legal or not. All economic activities can be divided into two groups: observed (directly measured in the basic data on production, incomes, and expenditures) and non-observed (indirectly measured during compilation of the national accounts (OECD 2002, p. 11). The most likely non-observed activities are those underground or hidden (i.e. production of legal goods and services undisclosed in order to avoid taxes, duties, etc.), illegal (which means production of goods and services forbidden by law or carried out by unauthorized producers), informal (undertaken by usually unregistered units engaged in the production of goods or services with the primary objective of generating employment and incomes to the persons concerned) and household production for own final use (goods or services consumed by the households that produced them) – see OECD (2002, p. 37-41).

The basic reason that makes people move from a legal to an illegal sector is the willingness to avoid taxes and other charges related to legal employment or economic activity (e.g. obligatory contributions to state pension and health funds). The official activity is also avoided if taking it up requires huge efforts or depends on fulfillment of restrictive conditions, such as the requirement to comply with a large number of legal regulations and getting a pile of certificates and permissions. It is an additional cost of starting up and running a business in the official sector. Another reason for completing illegal transactions in the unofficial economy is that this sector is the only place where one can purchase goods (services) legally unavailable.

2. Consequences of the existence of the unofficial economy

The existence of the unofficial economy is usually negatively perceived, though it can have also some positive consequences. The effects of the unofficial economy are described in detail below. They include:

– influence on allocation of production factors,
– unfair competition,
– redistribution of incomes,
– falsification of official statistics,
– economic ineffectiveness,
– unfavorable influence on GDP growth rate,
– disintegration of social rules,
– indirect contribution to growth of budget revenues.

The impact of the parallel economy on the allocation of production factors is related to different cost valuation in enterprises in both official and unofficial economies. The bigger the difference between these costs the larger the temptation to give up the official activity. This argument shows that the unofficial economy disturbs the whole economic structure. Sometimes it has positive effects as it facilitates the proper course of adjusting processes.

The unofficial economy causes a disturbance of the competition system since unofficial activity is not subject to taxes or social charges. Generally speaking, unofficial activities generate private costs which are lower than private and social costs combined. It results in unfair competition via the entrepreneurs using cheap illegal labour. It means that unofficial production is cheaper than the official one. Some authors claim that the parallel economy is close to the

ideal free market economy (Schneider 2004, p. 38). Low prices paid in the parallel sector make its products more available to consumers. On the other hand, the absence of taxes and social security contributions increases the incomes of producers and workers. In the case of the two groups it leads to increased purchasing power and consumption growth. Looking for positive aspects of the existence of the unofficial economy one can point at neutralization of unemployment effects, making a chance to enhance the life standards and reduction of costs in private businesses. As long as the parallel economy is considered to be a rival to an official sector, the existence of the former makes competition more severe and may trigger the growth of efficiency in the latter, too (for more information, see Mróz 2002, p. 142).

The existence of an unofficial sector causes redistribution of incomes: from these employed legally to those employed illegally. It enables part of society to avoid paying some costs of the functioning of the state. The extreme result might be the inability of state authorities to act effectively. The growing unofficial economy results in a decrease of budget revenues. The important consequence of a shortage of public funds is a poorer quality and a smaller amount of goods and services delivered by the state. It particularly concerns public goods (e.g. national defence, street-lighting). As a result, taxation of companies and individuals operating in an official sector may increase while at the same time the quality of public goods and administration services might decrease, which can additionally encourage people to move to the parallel economy. The existence of an informal sector also reduces the state's capacity to bear expenses important for economic growth (e.g. education). However, the positive aspects of the redistributive effects of the unofficial economy is a reduction of income inequalities, which diminishes the possibility of potential social conflicts.

The existence of the unofficial economy also results in the falsification of official statistics. It hampers not only the proper evaluation of the economy and its development prospects but also makes it difficult to pursue a proper (therefore effective) economic policy.

The additional effect is the necessity to bear the costs of control and prevention of the activities in the parallel economy by the state. At the same time illegal employees and owners of unregistered businesses bear the costs of hiding their activities. These two kinds of costs constitute economic ineffectiveness as they are not balanced with the rise of production of goods and services (that is a sort of sunk costs).

The grey market can negatively affect the rate of GDP growth since its existence prevents technological progress and discourages from investing in the official economy. Moreover, it preserves a lower level of technological development. This is because in the unofficial sector relatively outdated labour-intensive technology is used; it is seldom substituted with a modern one because of lack of budgeted expenditures on activities promoting innovation.

Other negative results of the unofficial economy are a disintegration of conventional social rules and an emergence of negative patterns of the ethics of economic activity. Moreover, criminal activities undertaken in the parallel economy can negatively influence the whole economy and even become a barrier to growth. Additionally, as contractors resist concluding agreements (they want to stay outside the official system), they are also not protected against unfair partners.

On the other hand, one can find some positive results of the grey market. It stabilizes the economy, absorbing shocks and difficulties of the official sector (e.g. via reducing the unemployment rate; for more information, see Mróz 2002, p. 141). Illegal employment influences the economy in a way similar to reduction of tax rates and as such results in faster economic growth. Moreover, additional incomes originating in an unofficial sector are usually spent (not saved) because both its employees and buyers are usually rather the poorest and not the richest members of society (according to GUS (1995, p. 26) all incomes from trade and service activities of natural persons in the unofficial sector are consumed). A similar tendency can be observed in enterprises operating in this sector (see Schneider's research (2004, p. 38)). It means that the unofficial sector indirectly contributes to the growth of demand in the official economy and consequently to growth of budget revenues.

3. Assessing the size of the unofficial economy

Attempts to measure the size of the unofficial economy encounter serious problems. A fundamental difficulty derives from lack of the widely accepted definition of both the phenomenon itself and its scope. It can be well seen in the alternative approaches presented above. What makes it even worse is the avoidance of any kind of registry and evidence, which is the feature of this economy. Problems also result from using different research methods and estimation techniques by different authors, which makes comparison and interpretation of the results almost impossible.

In one of the best known classifications of the size and dynamics of the informal sector methods of its measurement are divided into indirect and direct ones. The first ones are usually made on macroeconomic level. They consist of examining the trails left by unofficial activities in different branches of the official economy. The latter usually concern microeconomic sphere and are often based on the examination of the extent of tax fraud.

Indirect (macro) measures are relatively easy to use. They are e.g. used when analyzing differences between expenditures and incomes. The positive difference is assumed to be the indication of activity undertaken in the unofficial economy. The size of the informal sector can also be estimated by analysis of the balances of supplies and raw materials, e.g. the proportion between energy consumption and GDP in the base year is set and the predictions of GDP over the next years are made. As in the previous example, differences between the real and the predicted values testify to the existence and size of the unofficial economy.

Indirect methods are often used in intertemporal comparisons. E.g. monetary methods examining the trails unregistered activity leaves in the monetary sphere (it is usually assumed that hidden payments are made in cash) allows the researcher to use different sources of information (indirect analytical partial methods, e.g. controls of registries of economic phenomena, verification of accounts and financial reports, analysis of customs registries) and taking into consideration many factors influencing the unofficial economy (the so called multi-factor methods). Some of the advantages of indirect methods include: the ability to use published data, lack of disadvantages common for surveys (see further), the possibility to assess not only the size but also the dynamics of the parallel economy (Cichocki 2006, p. 40).

Indirect methods, however, do have some disadvantages. Differences that are obtained do not necessarily reflect the size of the unofficial sector. They can also have different sources (e.g. payments in cash can be proof of the underdevelopment of the banking infrastructure). Results are generally highly aggregated and depend on subjectively chosen indices and arbitrarily accepted assumptions. There are also some problems with generalization of results (more see: Mróz 2002, p. 58-79). There are also severe problems with the definition of the unofficial economy – it is usually defined very generally and with no reference to SNA (Cichocki 2006, p. 41).

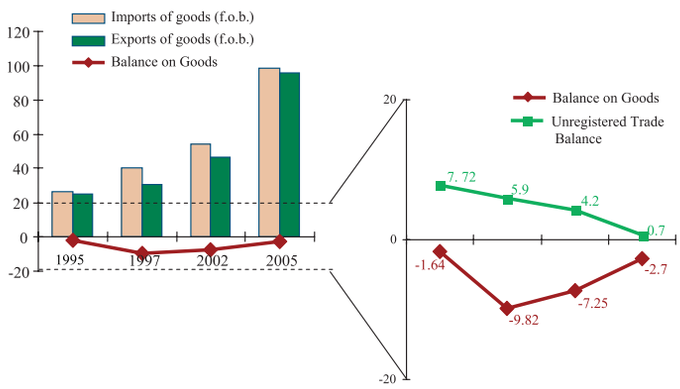
On the other hand, the main advantage of direct (micro) measures is the large number of information obtained. In this framework, different kinds of research are possible, e.g. public opinion polls, analyses of tax returns' samples, surveys concerning the labour market. It brings specific information on some forms and signs of the parallel economy. Information about the nature, structure and persons involved in grey market activities is usually precise. These methods, however, also have some disadvantages, mainly because of their set-up (especially sampling). Moreover, people involved in unofficial activities are reluctant to share information on them. For this reason, researchers may be induced to treat non-responses as partial confirmation of the existence of the parallel economy (volume of hidden activity can be estimated as higher than the average in the whole sample, considering some adverse selection among people choosing not to respond). The results also depend on the way the questions are formulated. In effect, these methods are characterized by a fairly high level of subjectivism and fragmentation, which makes generalization of results particularly difficult. It is also impossible to prepare any long term projections. Doubtful results are achieved in terms of intertemporal comparisons as well.

Some methods are useful in surveying only selected parts of the unofficial economy. It is especially interesting when exceptionally intensive and diversified activity is examined. Unregistered trade in some goods (e.g. alcohol and cigarettes) along the eastern border of Poland is examined by means of indirect methods below. Moreover, we analyze possibilities of using the chosen direct methods of approach to this trade.

4. Indirect measurement of illegal trade on the eastern border of Poland

Nowadays, academic research of unregistered trade in goods smuggled across the eastern boarder of Poland is difficult. Poland does not have basic data on that trade, because the Polish Central Statistical Office has not been collecting such data since 1997. In the early 1990s, the economy under transition, the unstable legal system, state institutions not prepared for new challenges, and a spreading of unregistered transactions in open-air markets resulted in an increase in the volume of unregistered imports and exports through the borders. Moreover, the depreciation of the Polish zloty affected the growth of exports in the mid-1990's and, consequently, a surplus in the balance of unregistered trade reached value of USD 7.7 billion in 1997. The surplus was classified to the national balance of payment, so that it played an unquestionable role in improving the national balance on goods (see Figure 1).

Figure 1. *National balance on goods and unregistered trade balance in Poland, 1995-2005 (USD billions)*



Source: Central Statistical Office, Annual reports of balance of payment, various years. Unregistered trade data source: Ministry of Finance.

In the left part of Figure 1 we present values of exports and imports of goods. In the right part of Figure 1 we show a comparison of Polish balance of goods and unregistered trade. Figure 1 shows how important unregistered trade has been for the Polish balance on goods in the period 1995-2005. For example, without the unregistered trade surplus, the deficit of the balance on goods in 1995 would have reached USD 9.36 billion. The surplus in unregistered trade has been substantially reducing the trade deficit for many years, though its value has been gradually falling.

Since the Central Statistical Office does not register either cross-border trade or open-air market trade, there are no data and the problem in assessing unregistered trade has arisen. We can follow the indirect data such as cross-border passenger transport, number of cases of customs-related offences and crimes registered by customs offices. Unfortunately, these sources of data are inadequate to evaluate the unregistered trade volume that still seems to be significant when looking at "Jarmark Europa" in Warsaw or other open-air markets in eastern Poland.

The lack of official statistical data seems to suggest that unregistered trade does not exist or its size is negligible. It also suggests that the economy has normalized, informal trade has become formal and the previously unregistered trader is nowadays a registered company. But even superficial observation indicates that unregistered trade is existent, though it has changed. We still observe price differentiation among the EU countries and their eastern neighbours, especially in goods and services in FMCG sector (Fast Moving Consumer Goods, i.e. household products, groceries, cosmetics), health care services (comparing them in Poland and Germany), counterfeit goods and fakes (illegally copied CDs, DVDs, branded goods). Many illegally produced or imported goods are sold in open-air markets and the demand for them is significantly high.

In this situation we can analyze unregistered trade using indirect methods. Below we analyze cross-border passenger transport and a number of offences and crimes connected with trading in goods. We present conclusions of such an analysis. Let us make it clear that such form of research does not perfectly reveal the real volume of cross-border trade and does not give full information about unregistered trade consequences and its significance for the Polish economy. It is also difficult in this framework to describe unregistered trade developments on the eastern border after Poland joined the European Union on May 1, 2004.

In terms of cross-border passenger transport, comparing 2003 to 2004, the number of people passing Polish borders increased by 24% (see Table 1). The significant rise was noticed on the western border (a 54% increase in number of people, compared to 2003). Undoubtedly, the most important reason for such a substantial increase of passenger transport on the western border in 2004 was Poland's accession to the European Union and elimination of internal border controls. Since May 1, 2004 Polish citizens have been able to cross the EU border using their identity card and there is no registration of passenger transport via the border with Germany, Czech Republic and Slovakia. The smallest increase in cross-border passengers flow in 2004 was recorded on the eastern border (2% in comparison with 2003) and on the southern one (1%). Interestingly, the number of passengers crossing Poland's eastern border hasn't fallen after Poland's EU accession.

In the first quarter of 2005, passenger transport on the eastern border increased by 15% compared to the corresponding period of 2004 (from 5.54 million

Table 1. *Passenger transport via Polish borders in 2000-05, in millions of persons and as percentage change in comparison with base year (2000 or 2001)*

Border	2000	2001	2002	2003	2004	2005
East border	32.04	30.85	28.68	26.81	27.36	30.42
South border	-	85.00	72.73	63.44	65.55	-
West border	89.75	60.58	50.99	50.85	78.51	-
Airports	4.75	4.86	4.90	5.13	6.81	9.51
Sea border	-	3,84	3.01	2.52	2.19	1.72
Total	-	185.13	160.33	148.75	180.42	-

Source: Own calculations based on the Customs Service of the Republic of Poland (2005).

to 6.35 million people). The number of Polish citizens crossing the eastern border in the afore-mentioned period increased significantly from 1.4 million to 2.6 million (by 85%), while the number of foreign visitors decreased from 4.14 million to 3.75 million (by 9%). A fall in the number of foreigners entering Poland via the eastern border was affected by the imposition of visa requirements for the citizens of Belarus, Ukraine and Russia, and visa payment requirements for Belarussians. The latter affects Belarussians in particular, by adding to their travel costs: the price of temporary resident one-entry visa to Poland is equal to USD 6, the price of two-entry visa is USD 10 and of multi-entry visa - USD 30. An additional fee of USD 40 has also been introduced for applicants seeking a temporary work permit (see also Table 2).

Analyzing open-air markets (bazaars) in large cities and small towns along the eastern border of Poland, it can be stated that unregistered trade plays an important role in the lives of people there. Recurrently, the goods imported from the East are sold by Russians, Belarussians, Ukrainians at prices much lower than in retail stores, e.g. the open-market price of one pack of Marlboro is between PLN 4 to 4.5. By contrast, its retail store price is PLN 6.9. The case of alcoholic products looks similar. The difference in prices is the reason why tobacco and alcoholic products constitute the most important group of goods illegally traded in bazaars. The number of offences and crimes connected with smuggling of tobacco and alcoholic products via the border may attest to the importance of these goods in unregistered trade (see Table 3).

The data on offences and crimes connected with trade in goods are provided by the Central Statistical Office (GUS) in the file with press releases and tables of statistical data because GUS does not collect the data in any other way. In our paper, statistics are built on the basis of the information from the Customs Service, the institution attached to the Polish Ministry of Finance.

Table 2. *Passenger transport via the particular border in 2002-05 in millions of persons (considering only land borders)*

Border with	2002	2003	2004	2005
Russian Federation	3.94	3.13	3.55	3.87
Lithuania	3.02	3.21	3.77	-
Belarus	9.53	8.83	7.95	8.79
Ukraine	12.19	11.63	12.07	17.75
Slovakia	14.45	13.98	15.48	-
Czech Republic	58.28	49.45	50.06	-
Germany	50.99	50.85	78.51	-
Total	152.41	141.10	171.42	

Source: Customs Service of the Republic of Poland (2005).

Table 3. *Offences and crimes connected with trade in goods in 2001-05*

	Year					
	2001	2002	2003	2004	2005	2001–2005
Customs crimes total	18 684	20 012	23 885	15 412	4 815	82 808
– in imports	18 402	18 820	22 135	14 101	4 025	69 493
Customs offences total	6 728	5 073	5 407	18 139	34 146	69 493
– in imports	6 676	4 965	5 078	16 841	31 910	65 470
Currency crimes total	79	38	10	8	32	167
– in imports	0	3	0	1	1	5
Currency offences total	12	5	3	1	2	23
– in imports	2	1	3	0	2	8

Source: Customs Service of the Republic of Poland (2005).

Table 4. *Customs-related offences and crimes in 2000-05 – number of cases initiated*

Year	Imports		Exports	
	N° of cases	Value of goods (million PLN)	N° of cases	Value of goods (million PLN)
2000	20 809	128.23	259	14.81
2001	23 859	153.19	389	14.84
2002	22 629	115.11	1 206	9.57
2003	27 214	122.22	1 751	12.27
2004	30 943	118.22	673	6.97
2005	35 938	83.00	435	4.56

Source: GUS (2006).

In Table 3 we can see that in the period 2001-2005 the number of customs-related crimes significantly decreased, from 18,684 to 4,815. At the same time, overall number of customs offences increased more than five times. Almost all of them are connected with imports. Customs-related offences usually take form of smuggling of small amounts of goods such as cigarettes and spirits into Poland. However, the rise in customs offences is not easy to interpret. It can reflect an increase in imports of goods in cross-border trade, as well as an improvement of the effectiveness of customs controls.

The Customs Service has dealt with issues concerning the excise tax and tax inspection since September 1, 2003 and this has resulted in reporting a large number of cases, in terms of illegal imports in 2003 and 2004. In 2004, it was reported that the number of customs-related offences and crimes, in terms of imports, has increased by 12% compared to the previous year (see Tables 4 and 5). The largest increase (number of customs-related offences and crimes increased by 74%) was registered by the Customs Chamber in Przemyśl, which deals with the Ukrainian border. The fall was recorded in Białystok (a 4% decrease in customs-related offences and crimes) and Biała Podlaska (a fall of 3.9%). The latter one was due to the fall of unregistered trade volume with Belarus. These facts may suggest that imposing visa requirements for Belarussians limited the overall number of their visits to Poland and consequently also the number of their trips connected with illegal business. On the other hand, visas for Ukrainians are free of charge and their visits have not been restricted.[1]

As the statistics show, a significant fall in passenger transport took place on the eastern border of Poland, mostly because of the administrative procedures and visa requirements on the border, as it has become an EU border. Analyzing the number of customs offences and crimes connected with exchange of goods, we can conclude that the volume of trade with eastern neighbours of Poland decreased in the last years. It happened mostly because of the administrative procedures, visa requirements and accurate luggage controls of the citizens of Belarus, Ukraine and the Kaliningrad District.

Due to constrained availability of the statistical data on illegal trade one has to search for other sources of information on this phenomenon. It can be

[1] The agreement between Poland and Ukraine stipulating the rules for passenger movement via the border was signed on June 30, 2003.

Table 5. *Customs-related offences and crimes in 2000-04 – selected by customs offices controlling trade mostly with Belarus, Russian Federation and Ukraine*

	Biała Podlaska		Białystok		Olsztyn		Przemyśl	
	N° of cases	Value of goods (million PLN)	N° of cases	Value of goods (million PLN)	N° of cases	Value of goods (million PLN)	N° of cases	Value of goods (million PLN)
2000	4517	38	1375	13	1650	5.7	2510	9.2
2001	5388	43.6	2281	28	1919	5.8	2364	6.6
2002	5850	41.5	3643	12	2602	9.4	2706	3.1
2003	7213	26.3	3304	b.d.	3465	7.2	2674	9.1
2004	7065	24	3233	8.7	3883	4.3	4651	7.1

Source: GUS (2006).

Table 6. *Customs-related offences and crimes in 2000-04 – selected by customs offices controlling trade mostly with Belarus, Russian Federation and Ukraine*

	Ethyl alcohol >80%		Cigarettes		Cars		CDs and other data carriers		Sports shoes		Perfumes	
	N° of cases	Value of goods (million PLN)	N° of cases	Value of goods (million PLN)	N° of cases	Value of goods (million PLN)	N° of cases	Value of goods (million PLN)	N° of cases	Value of goods (million PLN)	N° of cases	Value of goods (million PLN)
2001	8 296 (8 292)	49.88 (49.83)	8 525	55.58	4 164	29.17	176	4.97	14	0.35	-	-
2002	7 650 (7 643)	33.88 (33.84)	10 695	33.92	2 577	13.63	141	3.25	42	4.62	-	-
2003	4535 (4 443)	11.7 (11.7)	15 373	44.49	2 964	16.71	118	4.6	55	11.36	38	0.25
2004	3600 (3324)	5.11 (4.46)	20 644	67.84	2 542	12.75	218	7.71	39	1.45	75	1.11
2005	2191 (1 854)	4.47 (3.61)	25 048	41.88	2 516	4.57	208	6.15	30	1.19	91	7.64

(*) numbers in brackets relate to imported goods
Source: GUS (2006).

provided by using direct measure methods. Although the methods have also disadvantages, they can successfully supplement information gained from indirect approach.

5. Selected direct methods of measuring unregistered trade (statistical approach)

In research dealing with volume of unregistered trade, in particular with East European countries, it is necessary to use statistical methods. When planning how to measure unregistered trade, which is meant to assess the scale of the trade, we might use three basic but very different approaches. The first approach is a questionnaire survey based on a random stratified sample of adult citizens of Poland. The second approach is a direct survey of open-air markets in Poland (a survey sample, not a complete enumeration). The third approach is a study based on information from the Police Department about arrested traffickers and their goods.

Each method creates various problems to be solved. In the case of a questionnaire survey the question about losses and weights arises (stratification into social, geographic and age groups). In the case of a bazaar data-based survey we need to consider stratification into weekends, Mondays and other weekdays. Stratification into different seasons of the year should also be taken into account. Apart from that the method of bazaar selection should be discussed (random or arbitrary).

We are aware of the fact that the analysis presented below can be directly applied not only to approach illegal trade in cigarettes and alcohol but also to estimate e.g. the amount of illegally sold (bought) compact discs, computer programs or fake clothes.

A questionnaire survey based on a random stratified sample of adult citizens of Poland would be one of the most usual (from statistical point of view) but most expensive solutions. A survey frame could be the PESEL Central Database (database of national identification numbers; the PESEL number is mandatory for all permanent residents of Poland and temporary residents living in Poland for more than 2 months; it has been in use since 1979). In a questionnaire survey of adult citizens stratified sampling should be used. Stratification should be done according to a voivodship (16 strata) and according to a dual town-country division within a voivodship (2 strata in each voivodship). Additionally, age strata could be created. The last one should not be numerous because too many strata could result in a too small sample sizes within some strata. It might also be useful to have strata according to the respondents' income. Unlike other suggested stratifying variables information necessary to create them cannot be obtained from available sources. The researcher may consider including into a questionnaire an additional question referring to a person's income and carrying out stratification after drawing a sample, i.e. conducting the so called post-stratification. Of course, this solution will certainly cause an increase in the number of non-responses. Also answer errors will be more numerous, which may prove the analysis to be inefficient.

Questionnaires should be anonymous. It is advisable to use some incentives (prizes for respondents could be an option). Questionnaires could be distributed by post, carried out by phone or through personal interviews. The last option is the most expensive one but it yields the most accurate data. Assessing the volume of e.g. illegal sale of cigarettes smuggled from countries placed to the east of Poland by means of a direct personal interview, it would be necessary to use two-stage sampling apart from stratified sampling. The survey frame would be different as well. Two-stage sampling involves drawing a certain number of the so-called first stage units (they can be statistical districts-units used by the Central Statistical Office) and then from within these we shall draw a certain number of second stage units which may be e.g. flats. Conducting two-stage sampling is usually prompted by financial reasons. Using simple sampling or even stratified sampling, sample units may be located geographically too distant from each other and the survey would be too time- and cost consuming to conduct. In the case of questionnaires posted by mail or conducted by phone two-stage sampling is not recommended. As we see, depending on the method of data collection, sampling method and sampling frame could be different. Using them the researcher also gets different information.

From the statistical point of view the two-stage sampling increases variance of applied estimators. Consequently, the random error is larger. However, non-random error usually grows smaller because direct personal interviews typically yield more accurate data. So we have to compromise between random errors, non-random errors and financial funds.

Formulating a proper question or questions enquiring about e.g. cigarettes purchased illegally should be left to experts in the field. One should think about precision and separation of issues touching individual answers.

In all kinds of questionnaires one should expect a non-response problem. So some steps to reduce it should be undertaken. Methods of dealing with non-response can be found in Kordos (1988), Särndal et al. (1992), Lehtonen, Pahkinen (2004). In the proposed analysis the proper formulas for stratified sampling or two-stage sampling for assessing the mean and the total value of the desired characteristics should be applied. The proper formulas for required sampling schemes are given in Zasępa (1972), Särndal et al. (1992), Bracha (1996), Lehtonen, Pahkinen (2004).

Another approach to assessing the volume of unregistered trade is a direct survey of open-air markets. Target population consists in this case of all open air markets in Poland. To conduct a proper survey, it is necessary to divide the population into two sub-populations. The first one would consist of open-air markets of utmost strategic importance, regarding unregistered trade. The second one would consist of regular open-air markets of local importance.

In this case, the total number of all regular open-air markets in Poland is unknown and this is the first serious problem which arises here. The first step to solve it should be to assess this number. One can do this e.g. by dividing the territory of Poland into voivodships and within each voivodship into relatively small geographical entities. From each voivodship we should draw some number of geographical entities, gather information about the number of open-air markets in selected entities and use the appropriate estimator.

In an optimally constructed survey in a subpopulation of strategic open-air markets it is necessary to conduct a complete enumeration, i.e. to study all markets regarding the volume of goods sold illegally. In a sub-population of local markets it would be advisable to conduct multi-stage sampling. The problem is that we do not have any sampling frame from which we could select a sample. That is why one should use geographical entities drawn earlier in order to assess the number of open air markets. Only from these first stage geographical entities the researcher can draw in the second stage a small number of open-air markets and study them regarding volume of goods sold illegally.

If a study of a sub-population of regular local markets is impossible to conduct because of financial constraints, one can limit their research to strategic open-air markets only and extrapolate the results on the whole population by using expert knowledge and applying an appropriate multiplier. Of course, accepting such a solution will cause that the study will not be any statistical survey but in the case of lack of sufficient financial funds it could prove to be the only possibility.

When studying open-air markets regarding the volume of goods sold illegally one should also use another type of stratification. The subject of stratification should be the season of the year, weekdays or weekends. Mondays should be treated separately, e.g. in "Jarmark Europa" in Warsaw most of stalls are closed on Mondays. The appropriate method of measurement of the volume of goods put on sale in open-air markets should be left to expert knowledge.

Another approach would be studying data about apprehended traffickers. This research is based on the data obtained from police departments. Poland should be divided once again into two sub-populations. One sub-population should consist of

strategic cities and towns regarding trade with East European countries. The remaining towns and countries would constitute the second sub-population. In the first sub-population a complete enumeration is advisable, i.e. all entities should be studied and in the second one a survey sampling could be carried out.

By analogy to the previous method, when research needs to be conducted very quickly and in an economical way, one can limit herself to the main cities and extrapolate the results on the whole Poland using a suitable multiplier based on expert knowledge. Such a solution is a significant simplification of reality. But this kind of research has never been conducted in Poland so even a simplified analysis can be very useful.

Illustrative research for Warsaw could be constructed as follows. One should receive data from police departments about the number of apprehended persons and amounts of goods in their possession (e.g. number of boxes of cigarettes confiscated on a given day of the year). The day on which the largest number of traffickers was apprehended may be seen as a day on which there were no illegally sold goods because of an effective police action. The remaining days could be equalized to the day in which the maximum number of apprehended traffickers was obtained. In the face of this, when e.g. up to 50 traffickers were apprehended and they had 50,000 boxes of illegal cigarettes in their possession and on the other day 10 persons were apprehended and they had 9,000 boxes of cigarettes, one can assume that on that day about 36,000-41,000 illegal boxes of cigarettes were available in the market.

Obviously, here we also have many problems to solve. Stratification into weekdays and weekends should be applied. Mondays should be treated separately. Division into seasons of the year should also be applied. One should decide whether a point of reference should be the maximum number of apprehended goods or traffickers. Answers to all these questions are left to experts studying the different forms of the parallel economy.

From the methods proposed above, the last one based on the data obtained from the police about apprehended traffickers and their goods is definitely the cheapest and the easiest one to conduct. At the same time it is the least efficient one, because it does not possess any statistical or mathematical basis. It seems that the most sensible way to assess the volume of unregistered trade with the East European countries would be to use all three proposed methods. In fact, each of them measures a slightly different phenomenon. Moreover, with each method another type of error is connected. Only when one can compare results of different studies, they would be able to get broad information about this unfathomable aspect of market functioning.

Summary

We have analyzed unregistered international trade as a fragment of the parallel economy. We have shown that defining and measurement of the parallel economy and its elements is very difficult. We have presented a possibility of assessing the unregistered trade volume by indirect information such as cross-border passenger transport and the number of offences and crimes connected with trading in goods, but such form of research does not perfectly reflect the real volume of cross-border trade and does not give full information about the consequences of unregistered trade and their significance for the Polish economy. Using indirect methods we have proved that unregistered trade exists, though it has changed. We still observe price differentiation among the EU countries and their eastern neighbours, especially in goods and services in the FMCG sector, health care services (comparing them in Poland and in Germany), counterfeit goods and fakes (illegally copied CDs, DVDs, branded goods). Many illegally produced or imported goods are sold in open-air markets and the demand for them is significantly high.

We have also presented three statistical approaches to the problem of measuring the volume of unregistered trade with the East of Europe (a questionnaire survey based on a random stratified sample of adult citizens of Poland, a direct survey of open-air markets in Poland (a survey sample) and a study based on information from the Police Department about apprehended traffickers and goods they have passed through the border). From the first one (questionnaire survey) we can obtain information about a volume and value of illegally bought goods. From the second one (direct survey of open-air markets) and the third one (information about arrested traffickers) we know a volume and value of illegally traded goods. Only comparison of the results of these different studies can provide relatively precise information about the functioning of illegal trade. Unfortunatelly, direct measuring is relatively costly and research is very rarely made with alternative approaches.

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